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# Prevalence of Covid-19 Infection among Health Care Workers in a Mental Health Institution in Benin City, Edo State.

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**Abstract**

Coronavirus disease 2019 also known as COVID-19 is a zoonotic, contagious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The first known human infection as stated by WHO was in Wuhan, Hubei, China. A four (4) month retrospective study (January to April, 2021) was carried out on the Prevalence of COVID-19 infection among healthcare workers at Federal Neuro-Psychiatric Hospital, Benin City with the objective to determine its prevalence among this category of workers. A total of 299 Healthcare workers were enrolled in this study and were residents in five different Local Government Areas in Edo State. Samples for COVID-19 tests were collected by using a deep nasopharyngeal as well as a throat swab. Real-time polymerase chain reaction (RT-PCR) was performed on the collected samples. Statistical analysis was by descriptive Chi- square and cross tab methods while ethical approval was obtained from the ethical committee of the Federal Neuro-psychiatric Hospital, Benin City, Edo State. Results revealed that the mean ages for the study subjects were 35.5 years, with males accounting for 45% of the study group and females 55%. The most affected group in this study were the Pharmacist (25%), Clinical psychologists (25%), and Medical Laboratory Scientists/Technicians (22%) while Medical Practitioners, Nurses and Social Workers accounted for 8%, 11% and 8% respectively. Health Attendants accounted for 16% of positive cases while non-clinical staff including Drivers had 17% of positive cases, Accounts 11%, and Administrative staff had 17%. This study concludes that the prevalence

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## Introduction

Coronavirus disease 2019 (COVID-19) is a contagious disease caused by severe acute respiratory syndrome (SARS-CoV-2). It is thought to have an animal origin, through spillover infection (Andersen *et al*., 2020). Evidence suggests that it descends from a coronavirus that infects wild bats and spreads to humans through an intermediary wildlife host (Li *et al*., 2020).

The first known human infections were in Wuhan, Hubei, China. (Wu et al., 2020). Human- to-human transmission was confirmed by the WHO and Chinese authorities by 20 January 2020. According to official Chinese sources, these where mostly linked to the Huanan Seafood Wholesale market, where live animals are also sold (WHO, 2020). By December 2019,the spread of the infection was almost entirely driven by human-to-human transmission (Max *et al.*, 2020).

Symptoms begin one to fourteen days after exposure to the virus and may vary, but often include fever, cough, fatigue, breathing difficulties and loss of smell and taste. Around one in five infected individuals do not develop any symptoms (CDC, 2020). While most people have mild symptoms, some people develop acute respiratory distress syndrome (ARDS).

Preventive measures include physical or social distancing, quarantining, ventilation of indoor spaces, covering coughs and sneezes, hand washing, and keeping unwashed hands away from the face and nose. The use of face masks or coverings had been recommended in public settings to *minimize* the risk of transmissions. Several vaccines have been developed and various countries have initiated mass vaccination campaigns (WHO, 2020).

The standard diagnostic method for the detection of SARS-CoV-2 is by real-time reverse transcription-polymerase chain *reaction (*rRT- PCR) from a nasopharyngeal swab sample. The test is simple, the genetic sequence is specific within the viral genome. The nasal or throat swab sample collected helps to harvest viral particles and virus-infected mucosa cells. The swab sample is then lysed, and the viral RNA is extracted,

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and reverse-transcribed into cDNA. *The cDNA in* the processed sample is then quantified by qPCR to detect the presence of the virus genome and confirm infection with the virus (CDC, 2020).

Healthcare worker (HCW) refers to all persons working in a healthcare setting who has the potential for exposure to the patient and/or infectious materials including body substances, contaminated medical supplies and equipment surfaces, or contaminated air (CDC, 2020).

The response to the COVID-19 pandemic as declared by the World Health Organisation (WHO) in March 2020, elevated global cognizance of the role of healthcare workers as a critical resource for the world. This acknowledgment was accentuated as healthcare workers (HCWs) became frontline combatants across all pillars of the COVID-19 response with the attendant risk of infection (WHO, 2020).

As early as February 2020, scholars had established that transmission of the disease among HCWs in a healthcare facility was associated with overcrowding, absence of isolation room facilities, and environmental contamination (CDC, 2020).

Healthcare worker infection therefore, became an issue of concern in the early period of the pandemic response with documentation of alarming rates of HCW infections (Wang *et al.*, 2020). A report from the WHO joint mission to China in February 2020 reported 2055 COVID-19 laboratory-confirmed cases of HCW infections in 476 hospitals across China. It was reported that 29% of patients with COVID-19 infection were HCWs from a cohort of 138 patients treated in a hospital in Wuhan. The study also referred to the risk of widespread transmission in healthcare settings as evident by a super spreader patient who infected over 10 HCWs in the hospital(Wang *et al*., 2020). Similar observations regarding HCW infections were also noted in Spain as of 31st March 2020 with over 9400 HCWs consisting of approximately 15% of all confirmed cases infected with COVID-19 (Benavides, 2019). The WHO Africa region office also reported that over 10,000 HCWs had been infected with COVID-19 in Africa as of July 2020, with an average rate of 10% of infections in some key countries (WHO, 2020).

The evaluation of healthcare worker's prevalence among the *general population* of COVID-19 cases has therefore become an important variable in the epidemiologic analysis of the pandemic; with studies around the world documenting a range of 3% - 19% prevalence of HCWs among the populations infected with SARS-CoV-2 (Alajmi *et al*., 2020). Wu *et al.* (2020) in a Chinese Centre for Disease Control (CDC) report, documented that 3.8% of 44,672 cases were healthcare workers; while two studies from Italy reported that HCWs accounted for 9% (Fusco et al., 2020) and 9.8% (Livingston and Bucher, 2020) of cases in March 2020.

Elimian *et al*. (2020) in descriptive epidemiology of COVID-19 in Nigeria found that HCWs accounted for 9.3% of all positive cases. A hospital prevalence study from Qatar (Alajimi *et al*., 2020) reported a prevalence of 10.6% among tested HCWs; whereas the USA CDC (CDC, 2020) reported a 19% prevalence of COVID-19 in HCWs among a population of 49,370 people. In addition to the established higher risk of reporting a positive test for COVID-19 among frontline HCWs compared to the general population (Nguyen et al., 2020); patterns of distinctions in disease demographics and epidemiology, clinical trends and outcomes have also been documented in comparisons of HCWs and the general population with COVID-19 (CDC, 2020). The evaluation of HCW infections and applicable epidemiologic patterns at sub- national and national levels is, therefore, an important research focus; as the consequence of HCWs infection is depletion in the workforce available to confront the pandemic and increase risk of transmission among other HCWs and patients attending hospitals. These shortages in the health workforce result from self-isolation of health workers for periods of at least two weeks and the time lost to ill health thus imposing an increased workload on available staff. Besides,health workplace safety may also be compromised by the risk of hospital-acquired infections from healthcare workers to patients. A recently published rapid review identified lack of and/or inadequate personal protective equipment (PPE), exposure to infected patients, work overload, poor infection control and pre- existing medical conditions as important risk factors for nosocomial COVID-19 infection among HCWs (Mhango *et al*., 2020).

HCW has to deal with the challenge of how best to distribute scarce resources equitably between HWCs and patients who are equally in dire need (Greenberg et al., 2020). A single rapid review can rarely validly assess the risk factors for SARS-CoV-2 infection among front-line HCWs, as new cases are reported daily.

The aim of this study was to determine the prevalence of COVID-19 infection among Healthcare workers at Federal Neuro-Psychiatric Hospital, Benin City

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## Materials and Methods

**Study population:** The study population was made up of Healthcare workers across all Departments at the Federal Neuro-psychiatric Hospital Benin City. This retrospective study was carried out within a period of four months (January to April 2021).

### Specimen Collection and Processing

Samples for COVID-19 tests were collected by using a deep nasopharyngeal as well as a throat swab. Real-time polymerase chain reaction (RT- PCR) was performed on the collected samples at the Reference Molecular Laboratory to confirm infection.

### Statistical Analysis

Results obtained were analysed using Descriptive Chi-square and cross tab statistical methods.

### Ethical Considerations

Ethical approval was obtained from the ethical committee of the Federal Neuro-Psychiatric Hospital, Benin City, Edo State.

## Results

The Prevalence of COVID-19 infection among Healthcare workers in a Mental Health Institution in Benin City, Edo State was studied for four months (January to April 2021). A total of 299 Healthcare workers were enrolled in this study, reason for screening was random as a part of contact tracing or the presence of symptoms suggestive of COVID-19, having obtained positive case reports amongst a certain groups of workers within the hospital environment. The mean ages for the study subjects were 35.5 years, with males accounting for 45% and females 55%. The individuals were residents in different Local Government Areas in Edo State. Ikpoba-Okha 21%, Egor 39%, Ovia North East 12%, Oredo 23% and Uhumwwonde 5%.

This study revealed that 25% of Pharmacists were positive for COVID-19 as compared to other Healthcare workers, Clinical psychologists had 25% cases, Medical Laboratory Scientists/Technicians 22% while Medical Practitioners, Nurses and Social Workers accounted for 8%, 11% and 8% of recorded positive cases respectively. Health Attendants accounted for 16% of positive cases while non-clinical staff including Drivers had 17% positive cases, Accounts had 11%, Administrative staff had 17% respectively.

## Discussion

Protection of Healthcare workers from infection in the Healthcare facility is critical for the resilience of the health system facing a major pandemic like COVID-19.

In the professional group of Healthcare workers (HCWs), the most affected in this study were Pharmacists (25%), Clinical psychologists (25%), Medical Laboratory Scientists/technicians (22%) while Medical Practitioners, Nurses and Social workers accounted for 8%, 11% and 8% respectively. Health Attendants accounted for 16% of positive cases while non-clinical staff accounted for a cumulative 45% of positive cases including Drivers, Accounts and Administrative staff (17%, 11% and 17%).

Data analysis from the above indicates that the professional group with direct contact with patients as well as support staff with contact with patients and the environment are more at risk of infections.

This pattern observed corresponds with findings by Zheng et al. *(*2020*)* whose study found that the clinical staff group were more at higher infection risk than the non-clinical group. Also, a finding was observed in an Italian frontline hospital as clinical staff i.e. professional group accounted for higher seropositivity for SARS CoV-2 (Sotgui *et al*., 2020).

Corresponding findings were also noted from results in a study conducted in Rivers state, Nigeria on the prevalence pattern of COVID-19 among Healthcare workers. The professional group of Healthcare workers was observed to be most affected by COVID-19 (Alasia and Maduka, 2021).

A report from Oman indicated that Nurses accounted for 38% of positive cases while Doctors and Paramedics accounted for 13% of infections each with Administrative/ support staff making up 36% (Masaki et al., 2020).

Indications from all literature reviewed showed a recurring higher risk of infectivity for the clinical/professional groups than the non-clinical group. Hence, greater emphasis should be placed on the provision of personal protective equipment (PPEs), availability of running water, hand wash stations, provision of hand sanitizers as well as proper surveillance for infections.

In this study, the majority of HCW had their contacts within the hospital environment. Alasia and Maduka (2021), and Wang et al.,(2021) in their separate studies reported a higher rate of hospital- associated transmission this thus advances the need for better infection prevention control practices.

epidemiologic concern as Healthcare workers contribute to a significant burden of COVID-19 infections. This thus calls for an improved infection prevention control practices in the hospital environment.

## Conclusion

This study has shown that the prevalence of COVID-19 among Healthcare workers is high and a cause for

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**References**

Alajmi, J., Jeremijenkoa, A.M., Abrahama, J.C., Alishaqa, M., Concepciona, E.G., Butta, A.A. and Abou-Samra, A.B. (2020). COVID-19 Infection among Healthcare Workers in a National Healthcare System: The Qatar Experience. *International Journal of Infectious Diseases,* 100: 386-389.

Alasia, D. And Maduka, O. (2020).Prevalence Pattern of covid-19 among Health Care Workers in Rivers State.*Occupational Diseases and Environmental Medicine*.**9:**20-32.

Andersen, K. G., Rambaut, A., Lipkin, W. I., Holmes, E. C., and Garry, R. F (2020)."The proximal origin of SARS-CoV-2".*NatureMedicine*. 26 (4): 450–452.

CDC ( February 2020). "COVID-19 and Your Health".Centers for Disease Control and Prevention.Retrieved 23 January 2021.

Elimian, K.O., Ochu, C.L., Ilori, E., Oladejo, J., Igumbor, E., Steinhardt, L., Wagai, J., et al. (2020) Descriptive Epidemiology of Coronavirus Disease 2019 in Nigeria, 27 February-6 June 2020. *Epidemiology and Infection.*148, e208.

Fusco, F.M., Pisaturo, M., Iodice, V., Bellopede, R., Tambaro, O. and Parrella, G. (2020). COVID-19 among Healthcare Workers in a Specialist Infectious Disease Setting in Naples, Southern Italy: Results of a Cross-Sectional Surveillance Study. *Journal of Hospital Infection.* 105: 596-600.

Greenberg, N., Docherty, M., Gnanapragasam, S. and Wessely, S. (2020). Managing mental health challenges faced by healthcare workers during covid-19 pandemic.*British Medical Journal.*368:46-57

Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. (January 2020). "Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China". *Lancet.* 395 (10223): 497–506.

Li, X.., Zai, J.., Zhao, Q., Nie, Q., Li, Y., Foley, B.T. and Chaillon, A.(2020). "Evolutionary history, potential intermediate animal host, and cross-species analyses of SARS-CoV-2".*Journal of Medical Virology.* 92 (6): 602–611.

Li, Q., Guan,. X, Wu, P., Wang, X., Zhou, .L. and Tong, Y. ( 2020). "Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus-Infected Pneumonia".*New England Journal of Medicine.* 382 (13): 1199–1207.

Livingston, E. and Bucher, K. (2020) Coronavirus Disease 2019 (COVID-19) in Italy.*JAMA*, 323, 1335.

Maskari, Z.L., Blushi, A.A.L., Khamis, F., Tai, A.A.L., Salmi, I.A.L., Harthi, H.A.L., et al. (2020) Characteristic of Healthcare Workers Infected with COVID-19, a Cross-Sectional Observational Study. *International Journal of Infectious Diseases,* 102, 32-36.

Max Roser, Hannah Ritchie and Esteban Ortiz-Ospina (2020) - "Coronavirus Disease (COVID-19) – Statistics and Research".Published online at OurWorldInData.org. Retrieved from: 'https://ourworldindata.org/coronavirus' [Online Resource].quantification".

Mhango, M., Dzobo, M., Chitungo, I. And Dzinamarira, T.(2020). COVID-19 risk factors among health workers: A rapid review. Safety and Health at Work. 2020. pmid:32995051.

Nguyen, L.H., Drew, D.A., Graham, M.S., Joshi, A.D., Guo, G.-C.and Ma, W. (2020). Risk of COVID-19 among Front-Line Health-Care Workers and the General Community: A Prospective Cohort Study. *Lancet Public Health*, 5, e475-e483.

Novel Coronavirus Pneumonia Emergency Response Epidemiology Team (2020). "The Epidemiological Characteristics of an Outbreak of 2019 Novel Coronavirus Diseases (COVID-19) – China, 2020".China CDC Weekly. 2 (8): 113–122.

Report of the WHO-China Joint Mission on Coronavirus Disease (2019). World Health Organization (WHO). February 2020.

Wu, Y. C., Chen, C. S., and Chan, Y. J. (2020)."The outbreak of COVID-19: An overview". *Journal of the Chinese Medical Association.* 83 (3): 217–220

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Table 1: Frequency of occurrence of different professionals of health care workers in the study population/group.

| Health Workers | Percentage (%) |
|---|---|
| Nurses | 21 |
| Medical Practitioners | 4 |
| Social workers | 4 |
| Divers | 2 |
| Accounts | 3 |
| Occupational therapists | 3 |
| Health Attendants | 8 |
| Pharmacists | 4 |
| Clinical psychologists | 1 |
| Medical Laboratory Scientists | 6 |

Table 2: The age distribution of health workers in the study group

| Age | Percentage (%) |
|---|---|
| 21-30 | 6 |
| 31-40 | 36 |
| 41-50 | 33 |
| 51-60 | 25 |

Table 3: The distribution of Local Government of residence of the various health workers.

| Local Government | Percentage (%) |
|---|---|
| Ikpoba-Okha | 21 |
| Egor | 39 |
| Ovia North East | 12 |
| Oredo | 23 |
| Uhumwonde | 5 |