

## The influence of job category (rank) in the occurrence of infectious diseases among police personnel in south eastern Nigeria from 2012 to 2021

Charles Nduka Ikemereh<sup>1</sup>, Barinua Kekii Gbaranor<sup>2,\*</sup>, Omokorie Kalu Obasi<sup>1</sup>, Ado-Baba Ahmed<sup>3</sup>, Mariam N onye Onuzulike<sup>4</sup>, Frances Izuchukwu Eberendu<sup>1</sup>, Williams Amebebari Mube<sup>5</sup>, Olatoye Durosunmi<sup>1</sup> and Chimezie Stanley Chukwu<sup>6</sup>

<sup>1</sup> Department of Public Health, College of Medicine and Health Sciences, Imo State University, Owerri, Imo State, Nigeria.

<sup>2</sup> Department of Human Physiology, College of Medical Sciences, Rivers State University, Rivers State, Nigeria.

<sup>3</sup> Biology Department, University of The Gambia, Gambia.

<sup>4</sup> Department of Public Health, Alvan Ikoko Federal College of Education, Owerri, Imo State, Nigeria.

<sup>5</sup> Department of Obstetrics and Gynaecology, University of Port Harcourt Teaching Hospital, Rivers State, Nigeria.

<sup>6</sup> Department of Commercial and Property Law, Nnamdi Azikiwe University, Awka, Anambara State, Nigeria.

World Journal of Advanced Research and Reviews, 2024, 21(03), 1530–1535

Publication history: Received on 28 January 2024; revised on 07 March 2024; accepted on 09 March 2024

Article DOI: <https://doi.org/10.30574/wjarr.2024.21.3.0404>

### Abstract

The occurrence of infectious diseases among police officers is one of the neglected areas in health and scientific research. The aim of this study is to ascertain and assess the influence of job category (rank) in the occurrence of infectious diseases among police personnel in south eastern Nigeria from 2012 to 2021. The study was designed as a retrospective study using data from the central police clinics/hospitals for the period of ten years covering 2012 – 2021. The study population comprised all the recorded infectious disease data in the three police clinics/hospitals of study for police personnel documented from January 2011 to December 2021. Occurrences of infectious diseases were analysed through descriptive techniques such as construction of the frequency distribution and distribution charts. Chi-square test was performed to test for associating variables of interest in the study. The probability value (P) was used to interpret the significance level at 5% and P value less than 0.05 was considered statistically significant. The study found the overall rate of occurrence infectious diseases among police officers as 21.1% in the study area. Significant associating factors of infectious diseases occurrence among police personnel found in the study for job category is ( $P < 0.0001$ ,  $\chi^2=74.91$ ,  $df = 1$ ). Police officers at junior category were the most affected (24.1%) compared to the officers at senior category (11.9%). the rate of occurrence of infectious diseases is significant among junior category (rank) police personnel in the South Eastern Nigeria.

**Keywords:** Influence; Job; Occurrence; Infectious Diseases; Police; Personnel

### 1. Introduction

Infectious diseases are among the leading causes of mortality and morbidity all around the globe especially in the developing countries of the world. Infectious diseases are illnesses caused by harmful organisms (pathogens) that find their way into the body system from the outside through several media (agents/pathways). These include viruses, protozoans, fungi and bacteria that are transmitted from person to person, through bug bites and contaminated food, water or soil (Cleveland, 2023). These diseases include flu, measles, HIV, strep-throat, salmonella, COVID-19 and others. In 2019, the World Health Organization (WHO) placed two infectious diseases namely; lower respiratory infections and diarrheal diseases as among the top ten global causes of death (WHO, 2020). Though, deaths as a result of some infectious diseases such as human immunodeficiency virus/ acquired immune deficiency syndrome (HIV/AIDS) and

\* Corresponding author: Barinua Kekii Gbaranor

Tuberculosis (TB) have reduced globally in the recent years. Both diseases are still among the ten (10) leading causes of death in low-income countries as well as some other infectious diseases such as the lower respiratory infections, diarrhea diseases and malaria (WHO, 2020). In 2020, a newly emerged infectious pandemic, caused by the virus SARS-CoV-2 (Covid-19) emerged as among the leading causes of death around the globe, causing deaths in many countries including the United States where it was ranked as the third leading cause of death by the Centers for Disease Control and Prevention (CDC, 2021).

The occurrence of infectious diseases among police officers is one of the neglected areas in research (CDC, 2022). The duty of the law enforcement agencies especially the police is one of significant personal sacrifice performed globally. There exist growing concerns that the duty and patterns of performing job activities of police officers expose them to the possibility of contracting diseases including life-endangering infectious diseases such as AIDS/HIV, Hepatitis, Tuberculosis (TB), Typhoid fever, Meningococcal meningitis, Acute Respiratory Infection (ARIs), and other serious communicable diseases especially due to regular movements and transfers (Connor and Schwartz, 2005). For clarity of purpose, it is worthy to note that the Nigeria police ranking system refers to personnel from the rank of Assistant Superintendent of Police (ASP) to the rank of Inspector General of Police (IGP) as senior officers (senior category). While personnel from the rank of Inspector (INSPR.) down to recruit constables (PC.) are referred to as junior officers (junior category) (Nigeria Police Acts and regulations, 2020). In Nigeria, policing activities in the country is not usually an easy type considering the fact that police men and women play enormous and varied roles in the country which permits their interactions and mixture with the general public and environments (Nigeria Police Acts and regulations, 2020), some of which may predispose them to contagious diseases. At the moment, information related to police on infectious disease occurrence and prevention is limited. It is therefore important that studies on infectious diseases among police personnel are conducted.

## 2. Materials and Methods

The study was designed as a retrospective study using data from the central police clinics/hospitals for the period of ten years covering 2012 – 2021. The study population comprised all the recorded infectious disease data in the three police clinics/hospitals of study for police personnel documented from January 2011 to December 2021. To avoid duplication, only the police clinics/hospitals at the central police stations in each of the randomly drawn study states were used. Data were obtained from documented and electronic records of the infectious disease units at the police clinics/hospitals at Abia, Enugu and Imo states representing the South eastern states of Nigeria studied.

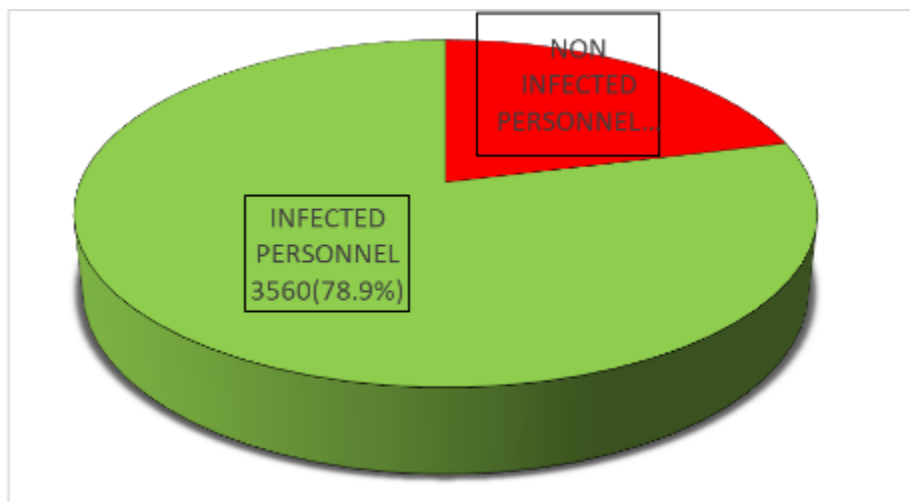
## 3. Results

The characteristics data containing the record information of the police personnel infected with infectious diseases for the period 2011-2021, within parts of South Eastern Nigeria, shows that in all, for the police personnel who attended the police hospitals of study, a total of 4513 were inspected for infectious diseases within the period. For the number inspected for infectious diseases, Abia had 1442 (32%), Enugu State recorded 1552 (34.4%) while Imo State had 1519 (33.6%). The overall rate of occurrence infectious diseases among police officers during 2012 to 2021 period is represented in Figure 3.1. For the entire 4513 police personnel that were examined at the police hospitals within the period studied, those that were infected with infectious diseases as documented were 953 (21.1%), while without the disease was 3560 (78.9%), leading to an overall occurrence rate of 21.1% for infectious diseases among police officers in the study area, for the 2012 to 2021 period. In terms of the category of the police officers, the record shows that the police personnel who were inspected for infectious diseases during the period studied were more at the junior category than that at the senior cadre.

**Table 1** Characteristics data of Police Personnel Inspected for infectious Diseases for the period of study 2011-2021 in study area

Characteristics	ABIA STATE		ENUGU STATE		IMO STATE		OVERALL	
	Freq	Percent (%)	Freq	Percent (%)	Freq	Percent (%)	Freq	Percent (%)
<b>Job Status</b>								
Junior Personnel	1078	74.8	1198	77.2	1128	74.3	3404	75.4
Senior Personnel	364	25.2	354	22.8	391	25.7	1109	24.6
Total	1442	100	1552	100	1519	100	4513	100

They were in all 3404 (75.4%) junior personnel, against 1109 (24.6%) police personnel at senior category. Across the three states utilized in the study, the junior personnel inspected for infectious diseases within the period were 74.8% in Abia, 77.2% in Enugu and 74.3% in Imo. Those at senior category were as follows: Abia state = 364 (25.2%). Enugu state = 354 (22.8%), Imo state = 391 (25.7%).



**Figure 1** Overall rate of occurrence Infectious Diseases among Police Personnel Studied (2012-2021)

**3.1. Overall Occurrence of Infectious Diseases among Police personnel in South Eastern Nigeria (2012 -2021) at Different Job categories**

The output presented in table 1.1 is the overall Occurrence of Infectious Diseases in terms of Job category among Police Staff in South Eastern Nigeria (2012 -2021). The table shows that the police officers at junior category were the most affected in terms of the occurrence of infectious diseases compared to the officers at senior category within the period (infectious disease rate: junior personnel =24.1%, senior personnel= 11.9%).

The difference in the occurrence of infectious diseases at both categories of the police was found significant at 5% level ( $P < 0.0001$ ,  $\chi^2=74.91$ ,  $df = 1$ ),

**Table 2** Overall Occurrence of Infectious Diseases in terms of Job category among Police Staff in South Eastern Nigeria (2012 -2021).

Job category	Total	Infectious Disease Positives	Percent (%)	Infectious Disease negatives	Percent (%)	$\chi^2$ (df)	P
Junior Personnel	3404	821	24.1	2583	75.9		
Senior Personnel	1109	132	11.9	977	88.1		
Total	4513	953	21.1	3560	78.9	74.94 (1)	0.0001

**3.2. Occurrence of Infectious Diseases in terms of Job category among Police Staff in South Eastern Nigeria in each state of Abia, Enugu and Imo (2012 -2021)**

Table 1.3 contained the occurrence rate of infectious diseases in terms of job category among police staff in South Eastern Nigeria in each state of Abia, Enugu and Imo (2012 -2021). The table shows that the junior police personnel recorded higher rate of infectious diseases in each of the three states studied. The rate was 25.1% at Abia State, 24.6% at Enugu State and 22.6% at Imo state. The rate for senior personnel was 14% in Abia, 10.2% in Enugu and 11.5% in Imo.

**Table 3** Occurrence of Infectious Diseases in terms of Job category among Police Staff in South Eastern Nigeria in each state of Abia, Enugu and Imo (2012 -2021)

Job Category	ABIA STATE					ENUGU STATE					IMO STATE				
	Infectious Disease:					Infectious Disease:					Infectious Disease:				
	Total	+ves	%	-ves	%	Total	+ves	%	-ves	%	Total	+ves	%	-ves	%
Junior Personnel	1078	271	25.1	807	74.9	1198	295	24.6	903	75.4	1128	255	22.6	873	77.4
Senior Personnel	364	51	14.0	313	86.0	354	36	10.2	318	89.8	391	45	11.5	346	88.5
Total	1442	322	22.3	1120	77.7	1552	331	21.3	1221	78.7	1519	300	19.7	1219	80.3
	$P < 0.0001, \chi^2 = 19.43, d.f = 1$					$P < 0.0001, \chi^2 = 34.03, d.f = 1$					$P < 0.0001, \chi^2 = 22.56, d.f = 1$				

+ves: positives, -ves: negatives, %: percent, P: probability value,  $\chi^2$ : Chi-square, d.f: degrees of freedom

#### 4. Discussion

The overall rate of occurrence infectious diseases among police officers studied was found to be 21.1% for the period of study. This rate is high and capable of causing burdens within the force and therefore should be a source of concern considering the role of police in the country. The rate is relatively stable with the three states studied. Likely reason could be to the fact that most police in the area work under the same command leadership and thus are sometimes redeployed within the zone (Nigeria police Act, 2020). This is likely to recycle similar activities and living patterns among the police personnel.

In terms of yearly occurrence of the infectious diseases, the patterns of the diseases do not seem to have varied much over the years but moved a bit higher in 2020. The variations are considered normal in this study considering that some infectious diseases emerged within some rare periods. For instance, in 2020, covid-19 infection emerged and caused devastating effects all around the world including Nigeria. The rate of occurrence of the infectious diseases was found to be relatively stable over the years (2012 -2021). The rate was lowest in 2012 but was highest in 2020, which happened to be the corona virus (covid-19) pandemic peak year in Nigeria. While the police clinics studied do not have documented records of police staff affected by covid-19 virus in their respective records, the disease seems to have triggered more hospital visits and test for respiratory related diseases with its high rate of occurrence.

The disease that recorded the most frequent occurrence over the years is typhoid fever (27.6%), followed by malaria (23%). It was not a surprise that both typhoid fever and malaria are endemic infectious diseases in the study area as well as in Nigeria and other areas within the sub-Saharan region. However, the rate obtained for malaria is slightly lower than the rate for the general population in the 2021 World Malaria Report that found Nigeria having the 27% of the global malaria cases (WHO, 2021). For typhoid fever, the finding here is higher than the rate of estimated number of typhoid fever cases in low- and middle-income countries (Mogasale, Maskery, Ochiai, Lee, Mogasale, Ramani, Kim, Park, and Wierzba, 2014; WHO Key facts, 2022). The differences are understandable as clear that the incidence of typhoid fever in Africa are yet to be fully understood (Antillón, Warren, Crawford, Weinberger, Kurum, Pak, Marks and Pitzer, 2017).

The rate of occurrence of some other infectious diseases such as hepatitis B, HIV, TB was high among the police, compared to their respective rates at the Nigerian general population. All the diseases were found to be higher than the rate of which each is prevalent in Nigeria and should be a source of concern. Hepatitis B rate was found as 13.5% which is quite high considering the WHO classification of HBV for which at least 8% is high, 2-7% is moderate and less than 2% is considered low (Terrault, Lok, McMahon, Chang, Hwang, Jonas, Brown, Bzowej, and Wong, 2018). The result is higher than 9.5% found in a recent study in Nigeria on general population (Ajuwon, Yujuico, Roper, Recharadson, Sheel, and Lidbury, 2021) and 11.2% found elsewhere in Cameroon (Bigna, Amougou, Asangbeh, Kenne, Noumegni, and Ngo-Malabo 2017). It is however by far higher than estimated for African (WHO, 2021b) and 3.6% estimated rate of the disease at the global population. Elsewhere in the United Kingdom, a study has shown that the rate of hepatitis found among police officers in very much lower (2.8%) compared to what was obtained in the present study (Morgan-Capner, Hudson, & Armstrong, 1988).

Infectious diseases such as HIV and TB recorded higher rates against what is obtainable at the general population. The HIV rate among police personnel in the study area was found as 4.2%, which is higher than the reported rate of 3.1% among adult population in Nigeria (NACA, 2016). Also, of sexually transmitted infections were found higher than the

rate at the general population. It therefore could mean that the police lifestyle activities are poor and especially as their job activities places them at greater risk of interactions and behaviours that are at greater risk for such diseases. Studies have shown that diseases such as HIV and hepatitis B are both associated occupation (Bandaranayake, Salmond, and Tobias, 1991) and poor behaviours (Heiskell and Tang, 1998).

The rate for TB (2.9%) is lower than the TB rate in Nigeria reported as 8% (WHO, 2018) yet the rate of occurrence for other airborne associated respiratory diseases was quite high (11.2%). Disease such as tuberculosis and most respiratory infections are usually airborne (Bates, 2020). Frequent redeployments among police officers could be responsible for their occurrences among force men and women. It could therefore imply that proper protective measures are not being taken into account when police are redeployed or sent for assignments that may involve visiting areas of elevated risk of the diseases.

Infectious diseases occurred more on officers at junior category against the rate for their colleagues at senior category. Most officers at lower ranks are usually sent to patrols, kiosks, club houses, hotel assignments and that possible make them vulnerable to infectious disease attacks as they are more likely to interact, or touch a lot of people to wedge off violence. The level of experience or job category has effect in the occurrence of infectious diseases (Sonder, Bovee, Coutinho, Baayen, Spaargaren and van der Hoek, 2005).

---

## 5. Conclusion

The rate of occurrence of infectious diseases is significant among police personnel in the South Eastern Nigeria. Police officers at junior category are at greater risk of infectious diseases than their senior colleagues, hence a concise focus on junior category (ranked) officers during health promotion policies may help foster optimal healthy policing with reduced societal transmission of infectious diseases.

---

## Compliance with ethical standards

### *Acknowledgement*

We wish to acknowledge late. Chief E.C.D. Ikemereh, Mr. W.C. Ikemereh, Prof. A.B. Ahmed, CP. Durosumi O., Prof. Ozims S.J. and Dr Barinua Kekii Gbaranor for their support and encouragement during the period of research.

### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

---

## References

- [1] Ajuwon, B.I, Yujuico, I, Roper, K,Rechardson, A., Sheel, M. &Lidbury B.A. (2021). Hepatitis B virus infection in Nigeria: a systematic review and meta-analysis of data published between 2010 and 2019. *BMC Infectious Disease* 21, 11:20
- [2] Antillón, M., Warren, J.L., Crawford, F.W., Weinberger, D.M., Kürüm, E., Pak, G.D., Marks, F.V. &Pitzer, V.E. (2017). The burden of typhoid fever in low-and middle-income countries: a meta-regression, approach. *PLoS Negl Trop Dis* 11: e0005376.
- [3] Bandaranayake, D.R., Salmond, C.E. & Tobias, M.I. (1991).Occupational Risk of Hepatitis B for Police and Custom Personnel.*American Journal of Epidemiology* 134 (12): 134:1447–53.
- [4] Bates, J. (2020). Police Departments, Sheriffs' Offices across the U.S. Grapple with COVID-19's Impact on Public Safety—And Their Own. *TIME*, 2020. Retrieved from, <https://time.com/5812833/coronavirus-police-departments/>
- [5] Bigna, J.J., Amougou, M.A., Asangbeh, S.L., Kenne, A.M., Noumegni, S.R.N. & Ngo-Malabo, E.T. (2017). Seroprevalence of hepatitis B virus infection in Cameroon: a systematic review and meta-analysis. *BMJ Open*, 7(6):e015298.

- [6] Cleveland Clinic (2023). Infectious Diseases. Available at <https://my.clevelandclinic.org/health/diseases/17724-infectious-diseases>. Accessed: January 11, 2023.
- [7] Centers for Disease Control and Prevention, (2021). [www.cdc.gov/nip/recs/adult-schedule.htm](http://www.cdc.gov/nip/recs/adult-schedule.htm).
- [8] Center for Disease Control and Prevention- CDC (2022). Parasites: About parasites. Available at: <https://www.cdc.gov/parasites/about.html>.
- [9] Connor, B.A. & Schwartz, E. (2005) Typhoid and paratyphoid fever in travellers. *Lancet Infect Dis*.5(10):623–8.
- [10] Mogasale, V., Maskery, B., Ochiai, R.L., Lee, J.S., Mogasale, V.V., Ramani, E., Kim, Y.E., Park, J.K., & Wierzba, T.F. (2014). Burden of typhoid fever in low-income and middle-income countries: a systematic literature-based update with risk-factor adjustment. *Lancet Global Health* 2: e570–e580.
- [11] Morgan-Capner, P., Hudson, P., & Armstrong, A. (1988). Hepatitis B markers in Lancashire police officers. *Epidemiology and infection*, 100(1), 145–151. <https://doi.org/10.1017/s0950268800065638>
- [12] NACA (2016). 6th National Council on AIDS (NCA) Conference; Innovative Approaches towards HIV Epidemic Control and Programme Sustainability at State Level. Abuja Nigeria. National Agency for the Control of AIDS.
- [13] Nigeria police Act (2020). Cap P19LFN 2004, 1<sup>st</sup> April 1943. Available at <https://refworld.org/docid/54f98f244.html> [accessed 24 December 2023]
- [14] Sonder, G.J.B., Bovée, L.P.M.J., Coutinho, R.A., Baayen, D. Spaargaren, J., van den Hoek, A. (2005). Occupational exposure to bloodborne viruses in the Amsterdam police force, 2000–2003. *Am J Prev Med*, 28:169–174.
- [15] WHO (2018). Guidelines on management of drug resistance TB. In WHO Treatment Guidelines for Drug-Resistant Tuberculosis. *JAMA* 11450. <https://doi.org/10.001/jama.2014.11450>.
- [16] World Health Organization (2021). World Malaria Report 2021. Geneva, World Health Organization.
- [17] WHO (2020). The top 10 causes of death. Geneva, World Health Organization. Available at: <https://www.who.int/news-room/fact-sheets/detail/the-top-10-causes-of-death>. [Accessed: December 4, 2022].
- [18] WHO Key facts (2022). Typhoid fever. Available at [https://www.who.int/newsroom/factsheets/detail/typhoid?gclid=EAIaIQobChMI686AhrbX\\_QVX5BoCR0lcQI\\_ZEAAAYASAAEgLBfD\\_BwE](https://www.who.int/newsroom/factsheets/detail/typhoid?gclid=EAIaIQobChMI686AhrbX_QVX5BoCR0lcQI_ZEAAAYASAAEgLBfD_BwE). [Accessed: November 14, 2022].