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Exploring Factors Influencing Ebola Vaccine Hesitancy among Healthcare Workers in Port of Entry (POE) Sierra Leone: A Cross-Sectional Study from 2021-2022

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Abstract

Background: This study investigated the factors influencing Ebola vaccine hesitancy among healthcare professionals in Port of Entry (POE), Sierra Leone.

Methods: This study adapted a qualitative cross-sectional research design involving 731 health care workers (HCWs) in the 12 POE districts drawn from primary healthcare and referral hospitals. A multivariable logistic regression was used to identify vaccine hesitancy.

Results: The mean age of the participants was 38.67 with a standard deviation of 9.76. Out of the 731 study participants, 190 were vaccinated with Ad26.ZEBOV and MVA-BN-Filo, while 541 remained unvaccinated. Notably, some health facilities (HFs) were not reached by the vaccination team. Additionally, 325 of HCWs obtained information about the EVD vaccine from social media. A considerable number 113 of HCWs believed that the EVD vaccine would not adequately protect them from EVD. Furthermore ,720 and 664 HCWs expressed the need for additional improvements in terms of awareness campaigns, recommending the EVD vaccine to the community, and enhancing the mobile team vaccination program.

Conclusion: There was evident of EVD vaccine hesitancy among HCWs in the POE districts. This study's findings are important as they may inform targeted interventions and strategies to enhance vaccine acceptance among HCWs in POE Sierra Leone, thereby mitigating the impact of Ebola outbreaks in the region.

Keyword: Ebola Virus Disease; Point of Entry; Ebola Vaccine; HealthCare Worker

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Introduction

Vaccines are essential weapons in the global fight against infectious disease prevention and control. According to the WHO, immunization currently prevents 4-5 million deaths every year across ages and genders. It is one of the most successful and effective public health interventions (WHO World Health Organization, 2024). Ebola virus diseases (EVD) have emerged as formidable threats, prompting the development and distribution of vaccines to mitigate their impact. The epidemics have centered mostly on west African countries, with some happening in the eastern and central areas as well, and with clinical presentations ranging from flu-like symptoms to severe hemorrhagic fever. EVD is a serious and frequently fatal zoonotic infection that is caused by a virus belonging to the Filoviridae family of the genus Ebolavirus (Choi and Hong, 2015). The virus responsible for EVD primarily exists in certain animal populations, and human transmission usually occurs through direct contact with the blood, secretions, organs, or other body fluids of infected animals.

Front-line healthcare workers' (HCWs) acceptability and uptake of the Ebola vaccine is crucial to the success of the immunization programme. A study conducted in the Democratic Republic of Congo on the control of the EVD outbreak that compared HCWs targeted and community vaccination strategies, revealed that because HCWs were highly vaccinated at the time, this also motivated community people to be highly vaccinated (Robert *et al.*, 2019). In the specific context of Sierra Leone Port of Entry (POE) districts, where the Ebola virus has historically posed a substantial risk, the uptake of Ebola vaccines among HCWs poses a significant challenge. The case fatality during the EVD outbreak in Sierra Leone was extraordinarily high, with around 28,000 confirmed cases and 11,000 deaths (Leone *et al.*, 2019). The first case in the country was reported on 24 May, 2014. By the end of October 2014, 3,854 laboratory-confirmed cases were reported, with 199 cases (5.2%) among HCWs (Leone *et al.*, 2019).

The problem at hand emphasizes the importance of understanding factors influencing vaccine hesitancy within key populations, such as the HCWs, because their actions have far-reaching consequences for public health outcomes. Vaccine hesitancy refers to delay in acceptance or refusal of vaccination despite availability of vaccination

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services(Macdonald and Group, 2015). Previous studies have pointed out vaccine hesitancy among healthcare workers (Larson *et al.*, 2015).

POE is a designated location where people, animals, goods, and vehicles can enter and exit the country legally or illegally.

Since the WHO declared the Ebola outbreak in West Africa a public health emergency, on 8th August 2014 (Andre *et al.*, 2008), (Leone *et al.*, 2019). there have been concerted efforts to achieve zero cases of Ebola outbreaks in Serra Leone. Since 2014-2021, 3 rounds of EVD vaccinations were administered to frontline workers and the general public by a Sierra Leone trial to introduces a vaccine against Ebola (STRIVED) and EBOVAC-Salone (Jalloh *et al.*, 2024),(Pinski and Messaoudi, 2022). The vaccine was implemented in Bombali, Port Loko, Tonkolili and western area rural districts. There were so many panics among citizens about the spread of EVD(Mooney *et al.*, 2018). The third round of EVD vaccine was provided only to HCWs and few a government official in 12 POE districts in 2021- 2022.

In May 2021–2022, the Ministry of Health and Sanitation (MOHS) and WHO experimented (clinical trials) with two doses of EVD vaccination (Adz26ebov and MVA-BN-Filo) in 12 POE and regional districts. More than 60% of the HCWs in all the districts refused to be vaccinated against EVD (MOHS-EPI) (Science, 2018). In Sierra Leone, during epidemic outbreaks HCWs are at high risk of infection. Previous studies found that HCWs are at high risk of contracting EVD (Report, 2021). The only way to avert future outbreaks of EVD is to embark on preventive measures such as the EVD vaccination. If 40% of the general population and 95% of HCWs receive the EVD vaccine, it will help to prevent EVD outbreaks in the country (Andre *et al.*, 2008),(Science, 2018).

In view of all these, the present study aimed to address the serious issue of vaccine hesitancy within this critical population, aiming to unravel the multifarious barriers and drivers that contribute to the reluctance or acceptance. By elucidating these factors, this study hopes to fill critical knowledge gaps and inform evidence-based interventions aimed at increasing vaccine acceptance, ultimately bolstering the healthcare systems, resilience against the persistent threat of EVD in Sierra Leone.

Material and methods

Study Area

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The study was carried out in 418 health facilities (HFs) in 12 POE districts of Sierra Leone. The districts include Kambia, Karene, and Koinadugu (bordering Guinea in the northern region), Kono and Kailahun (bordering Guinea in the eastern region), Kenema, Bo and Pujehun (bordering Liberia in the south of Sierra Leone). Port Loko, Western Area Rural, and Western Area Urban districts are located in the sea port and airport area. The different levels of HFs: Community Health Center (CHC), Community Health posts (CHP), Maternal and Child Health Post (MCHP), District Health Management Team (DHMT), and District Referral Hospital. Interviews were conducted in each HFs choosing for the research.

Study design

This study adapted a qualitative cross - sectional research design. Data collection started on November 10th and ended in December 11th, 2023.

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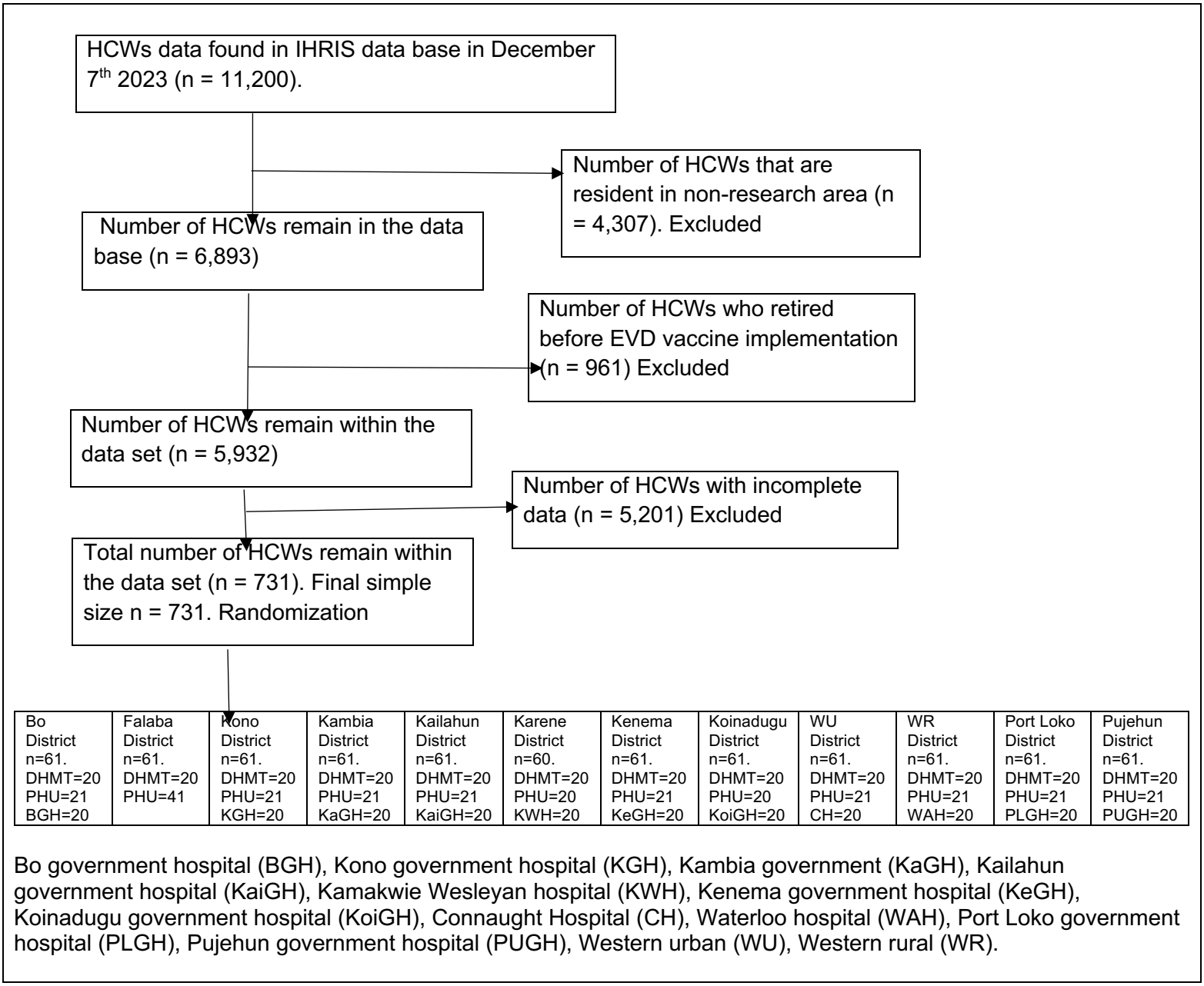

Figure1. Sample size selection criteria for 731 HCWs in POE district, Sierra Leone 2021-2022.

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Sample size and sampling technique

As of December 7th, 2023, the integrated human resource information system (IHRIS) of Sierra Leone MOHS contains 11,200 data for HCWs. The final simple size for this study is n = 731 HCWs; see Figure 1. In Sierra Leone, the health work force is dominated by female health workers, State- Enrolled Community Health Nurse (SECHN), Maternal and Child Health Aides (MCHA), and State Register Nurse (S.R.N), this is followed by Community Health Officer (CHO). There are few public health inspector (PHI), pharmacist, public health sister (PHS) and medical doctors.

The study employed a simple random sampling method to sample health facilities (PHU). There were 700 PHU, 12 DHMT, and 11 hospitals in POE district as of December 7th, 2023. Out of 700 PHU, 418 PHU were chosen for the study due to the high number of staff working in the HFs. The ballot papers were chosen randomly to select the name of PHU for data collection. All the 418 PHU were visited by enumerators for data collection. In Sierra Leone, each district has one DHMT, and one referral hospital. Expect for Falaba district without a referral hospital. In each PHU visited, all HCWs were interviewed, and for DHMT and hospital HCWs were chosen randomly by ballot paper.

Study participants.

HCWs are personnel who have direct contact with patients. The questionnaire was administered to different HCW designations, such as CHO, MCHA, SECHN, SRN, and other HCWs (Medical Doctor, PHS, PHI, Pharmacist (ministry of health and s a n i tat i o n the republic of sierra leone, 2021). In each district a total of 61 participants were interview, 20 participants from DHMT, 20 participants from the hospital and 21 participants from PHU, except for Karene district, which is 60 participants.

The enumerator collected data through face-to-face interviews. Each enumerator collected data on an Android phone and submitted it to the Kobo collect toolbox. Each HCW interviewee was asked about his or her immunization card in order to get true information. Interviews were conducted in English, and local languages where necessary.

Ethic clearance

The Sierra Leone Ethic and Scientific Review Committee (SLESRC) provided ethical clearance for this study under the reference number SLESRC: 013/11/2023. The purpose for the research was explained to all respondents, and each respondent was

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given an informed consent form to sign before the interview began.

Data collection

A total of 731 HCWs were interviewed. The questions were developed using Kobo Collect Tool. The questionnaire was pretested in 9 HFs across the districts; corrections were made, and it was validated by the research team. The first section of the questionnaire covers the ethics and objectives of the study. The second section of the questionnaire provides detailed information about the demographic characteristics. The third section of the questionnaire is to assess the knowledge of respondents about EVD. How do we confirm EVD positive cases? How do you prevent EVD? How to contact EVD? Signs and symptoms of EVD. The fourth section of the questionnaire is to investigate respondents EVD vaccine hesitancy and its reasons. Availability of EVD vaccine, type of EVD vaccine, contracting EVD after vaccination. EVD vaccine makes you sick. You can still contract EVD after vaccination. The fifth section of the questionnaire is the respondents' sources of information, which include DHMT, social media, community people, and rumors.

Fifteen final-year students from Njala University who were studying CHO were employed for the data collection for one month.

Data analysis

Data was analyzed using SPSS and Stata. Data were analyzed using both univariate (part of descriptive statistics was used) and multivariate (regression models) approaches. Frequencies and percentages were used to describe the prevalence of demographic characteristics. Multivariate analysis was used to determine the relationship between dependent and independent variables in this study.

Result

The mean age of the participants was 38.68 with a standard deviation of 9.00. The participants ages ranged from 27- 60 years. It shows that type of health facility, educational level, Kailahun district, Kambia district, Karene district, Kenema district, Koinadugu district, Kono district, Port Loko district, Pujehun district, Western rural district, and western urban district were statistically significant with a $P\text{-}value < 0.05$. Other variables are not statistically significant with a $P\text{-}value > 0.05$.

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Table1. Sample demographic characteristics of respondents (n =731) in POE district.

Indicators	[ALL] N=731	Vaccinated (N=190)	No vaccinated (N=541)	P-value
Age	38.7 (9.00%)	39.3 (9.12%)	38.5 (8.96%)	0.281
Sex				0.162
Female	403(55.1%)	96(50.5%)	307(56.7%)	
Male	328(44.9%)	94(49.5%)	234(43.3%)	
Type of Health Facility				**0.005**
DHMT	239 (32.7%)	44(23.2%)	195(36.0%)	
Hospital	219(30.0%)	63(33.2%)	156(28.8%)	
PHU	273(37.3%)	83(43.7%)	190(35.1%)	
Designation				0.936
CHO	147(20.1%)	40(21.1%)	107(19.8%)	
MCHA	146(20.0%)	38(20.0%)	108(20.0%)	
Other HCWs	146(20.0%)	40(21.1%)	106(19.6%)	
S.R. N	146(20.0%)	38(20.0%)	108(20.0%)	
SECHN	146(20.0%)	34(17.9%)	112 (20.7%)	
Educational Level				**0.004**
No Education	5(0.68%)	2(1.05%)	3(0.55%)	
Primary Education	7(0.96%)	5(2.63%)	2(0.37%)	
Secondary Education	52(7.11%)	20(10.5%)	32(5.91%)	
University Education	667(91.2%)	163(85.8%)	504 (93.2%)	
Marital Status				0.239
Marriage	442(60.5%)	123(64.7%)	319(59.0%)	
Separated	17(2.33%)	3(1.58%)	14(2.59%)	
Single	243(33.2%)	54(28.4%)	189(34.9%)	
Widow	29(3.97%)	10(5.26%)	19(3.51%)	
Religion				0.181

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Christian	344(47.1%)	81(42.6%)	263(48.6%)	
Muslim	387(52.9%)	109(57.4%)	278(51.4%)	
Number of children	2.14 (1.39)	2.22 (1.44)	2.11(1.37)	0.367
District				
Bo District	61(100%)	6(9.8%)	55(90.2%)	0.366
Falaba District	61(100%)	13(21.3%)	48(78.7%)	0.715
Kailahun District	61(100%)	26(42.6%)	35(57.45)	**0.001**
Kambia District	61(100%)	28(45.95)	33(54.1%)	**0.001**
Karene District	60(100%)	13(21.35)	47(77.0%)	**0.015**
Kenema District	61(100%)	17(27.9%)	44(72.1%)	**0.005**
Koinadugu District	61(100%)	12(19.7%)	49(80.3%)	**0.006**
Kono District	61(100%)	33(54.1%)	28(45.9%)	**0.003**
Port Loko District	61(100%)	11(18.0%)	50(82%)	**0.041**
Pujehun District	61(100%)	15(24.6%)	46(75.4%)	**0.001**
Western Rural District	61(100%)	5(8.2%)	56(91.8%)	**0.001**
Western Urban District	61(100%)	11(18.0%)	50(82%)	**0.001**

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Figure 2. Graph showing different variables with designations (CHO = 55, Other HCWs = 66, MCHA = 77, SECHN = 88, S.R.N = 99) in POE district.

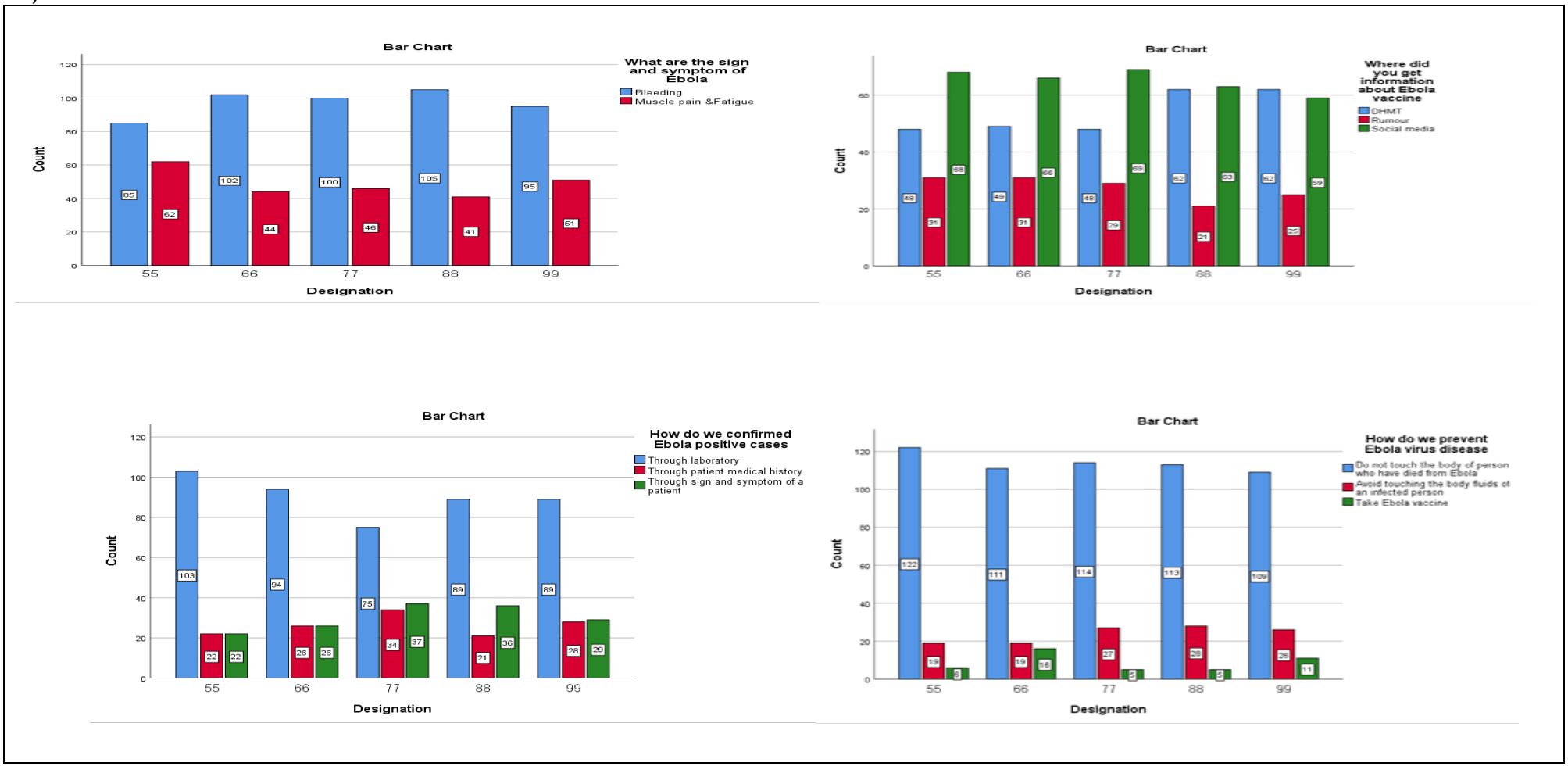

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Figure 2. Shows that 487 HCWs say bleeding is the only sign and symptom for EVD, and 244 HCWs say muscle pain and fatigue are the only sign and symptom (supplementary material Figure 2). The result also showed a knowledge gap in the confirmation of EVD cases. It shows that 450 HCWs say they can only confirm EVD positive cases through laboratory confirmation tests 131 of HCWs say they can confirm EVD positive cases through the medical history of a patient, and 150 of HCWs say they can only confirm EVD positive cases through the signs, and symptoms of a patient (supplementary material Table 4 and Figure 4). Also, the result shows HCWs have insufficient knowledge in the prevention of EVD cases. The result revealed that Kailahun district, Kambia district, Karene district, Kenema district, Koinadugu district, Kono district, Port Loko district, Pujehun district, Western rural district, and DHMT are statistically significant with *P-value* < 0.05 for both OR and adjusted. Other indicators like hospitals, secondary education and non-education only OR are statistically significant with a *P-value* <0.05. Several studies have identified that HCW can recommend vaccination to other people if they themselves are vaccinated (Paterson *et al.*, 2016). On the other hand, the level of health facility has a greater impact on health intervention, and it is likely to cause vaccine hesitancy, as evidence in their 95% CI. There is an evidenced for variables that cause EVD vaccine hesitancy in 95% CI. Their frequency also shows a high number of HCWs in Table 1 did not receive EVD vaccine, which is 541 HCWs, and 190 of HCWs received EVD vaccine.

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Table 2. The relationship between the frequency of variables not vaccinated and vaccinated with EVD vaccine of 731 HCWs in POE district.

Indicators	Vaccinated	No vaccinated	OR (95%CI)	*P-Value*	Adjusted OR (95%CI)	*P-value*
District						
Bo District	6	55	1.366(0.681,2.831)	0.366	1.402(0.676,2.907)	0.364
Falaba District	13	48	0.876(0.428,1.79)	0.715	0.812(0.389,1.695)	0.580
Kailahun District	26	35	0.259(0.114,0.591)	**0.001**	0.252(0.108,0.584)	**0.001**
Kambia District	28	33	0.129(0.048,0.343)	**0.001**	0.131(0.048,0.352)	**0.001**
Karene District	13	47	0.384(0.178,0.83)	**0.015**	0.389(0.177,0.853)	**0.019**
Kenema District	17	44	0.319(0.144,0.706)	**0.005**	0.317(0.139,0.721)	**0.006**
Koinadugu District	12	49	0.326(0.147,0.721)	**0.006**	0.328(0.146,0.736)	**0.007**
Kono District	33	28	0.289(0.129,0.647)	**0.003**	0.293(0.129,0.665)	**0.003**
Port Loko District	11	50	0.455(0.214,0.967)	**0.041**	0.473(0.219,1.020)	**0.056**
Pujehun District	15	46	0.105(0.037,0.299)	**0.001**	0.110(0.038,0.316)	**0.001**
Western Rural District	5	56	0.259(0.114,0.591)	**0.001**	0.253(0.109,0.586)	**0.001**
Western Urban District	11	50	Reference			
Level of Hospital						
DHMT	44	195	1.936(1.276,2.936)	**0.002**	0.523(0.327,0.837)	**0.007**
Hospitals	83	190	1.760(1.154,2.776)	**0.009**	1.125(0.734,1.723)	0.589
PHU	63	156		Reference		
Educational Level						
University Education	163	504	2.061(0.341,12.444)	0.430	1.660(0.241,11.452)	0.607
Secondary Education	20	32	7.730(1.486,40.222)	**0.015**	5.068(0.881,29.148)	0.069

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Primary Education	5	2	1.933(1.076,3.472)	**0.028**	1.828(0.965,3.463)	0.064
Non-Education	2	3	Reference			
Designation						
CHO	40	107	1.009(0.604,1.688)	0.971	0.64(0.293,1.398)	0.263
Other HCWs	40	106	0.941(0.561,1.580)	0.819	0.858(0.49,1.502)	0.592
MCHA	38	108	0.812(0.479,1.377)	0.44	0.780(0.432,1.407)	0.409
SECHN	34	112	0.941(0.561,1.580)	0.819	0.870(0.487,1.557)	0.640
S.R. N	38	108	Reference			

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In Table 3. Among the HCWs who answered the question, "Have you been vaccinated against EVD?" "Are you aware of the availability of Ebola vaccine in Sierra Leone?", "Have you been vaccinated against Ebola?", "Do you believe that getting vaccinated against Ebola protects you from contracting the virus?", "Have you experienced any side effects after receiving the Ebola vaccine?", "Are you satisfied with the information you receive about the Ebola vaccine before vaccination?", "Does this rumor affect your decision to take Ebola vaccine?", "Would you recommend the Ebola vaccine to others in your community?", "Did Ebola mobile vaccination team reach your health facility for vaccination?", "Are you aware of the availability of the Ebola vaccines in Sierra Leone?", was was statistically significant with a *P-value* < *0.05*. Other question, "Have you heard about Ebola virus disease?", "Have you heard about Ebola vaccine?" "Can I get Ebola right after being vaccinated?", "Can the Ebola vaccine make you sick?", "Can you still get the Ebola after first dose of the vaccine?", "Do you think it is possible to still get Ebola after receiving the first dose of the vaccine without the second dose?", "Have you received reports of negative information or rumors about the Ebola Vaccine?", "Do you think that more awareness campaigns on the Ebola vaccine should be conducted in Sierra Leone?" were not statistically significant with a *P-value >0.05*.

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Table 3. Showing frequency and EVD vaccine hesitancy determinate among HCWs in POE district.

Questions	CHO	Other HCWs	MCHAide	SECHN	S.R. N	*P-value*
Have you heard about Ebola virus disease?						
Yes	147	147	146	144	145	0.045
NO	0	1	0	2	1	
Have you heard about Ebola vaccine?						
Yes	142	142	139	138	141	0.478
NO	5	4	7	8	5	
Are you aware of the availability of Ebola vaccine in Sierra Leone?						
Yes	131	130	125	122	125	**0.001**
NO	16	16	21	24	21	
Have you been vaccinated against Ebola?						
Yes	79	107	61	92	98	**0.001**
NO	68	39	85	54	48	
Can I get Ebola right after being vaccinated?						
Yes	61	49	56	44	60	0.130
NO	86	97	90	102	86	
Can Ebola vaccine make you sick?						
Yes	73	66	67	70	63	0.627
NO	74	80	79	76	83	
Can you still get Ebola after first dose of vaccine?						
Yes	115	95	99	99	100	0.060
NO	32	51	47	47	46	
Do you believe that getting vaccinated against Ebola protects you from contracting the virus?						
Yes	125	124	118	127	124	**0.001**
NO	22	22	28	19	22	
Do you think it is possible to still get Ebola after receiving the first dose of the vaccine without the second dose?						

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Yes	130	115	113	107	116	0.127
NO	17	31	33	39	30	
Have you experienced any side effects after receiving the Ebola vaccine?						
Yes	52	53	46	65	60	**0.001**
NO	95	93	100	81	86	
Have you received reports of negative information or rumors about Ebola Vaccine?						
Yes	110	115	98	128	106	0.879
NO	37	31	48	18	40	
Are you satisfied with the information you receive about the Ebola vaccine before vaccination?						
Yes	84	84	81	85	89	**0.001**
NO	63	62	65	61	57	
Does this rumour affected your discission to take Ebola vaccine?						
Yes	55	44	55	53	43	**0.017**
NO	92	102	91	93	103	
Do you think that more awareness campaigns on the Ebola vaccine should be conducted in Sierra Leone?						
Yes	147	142	146	139	146	0.482
NO	0	0	0	7	0	
Would you recommend Ebola vaccine to others in your community?						
Yes	134	135	137	134	124	**0.001**
NO	13	11	9	12	22	
Did Ebola mobile vaccination team reach your health facility for vaccination						
Yes?	83	110	67	96	119	**0.001**
NO	64	36	79	50	27	
Are you aware of the availability of Ebola vaccines in Sierra Leone?						
Yes	123	125	121	117	123	**0.001**
NO	24	21	25	29	23	

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Discussion

The purpose of the current study was to determine whether or not EVD vaccine hesitancy was among HCWs in POE district 2021–2022. While all the HCWs believe that they are highly at risk and an EVD outbreak will kill them (Ahmad *et al.*, 2016). This study revealed that 729 of HCWs had heard about the EVD vaccine,633 are aware that EVD vaccine, is available at the district level, and 437 of HCWs answer yes that they have been vaccinated against EVD.

The result revealed that 325 of HCWs were more highly informed about the EVD vaccine through social media than the DHMT, which is the primary source of information. Obtaining information from social media and information from rumors about medical interventions may sometimes result in misinforming the HCWs. This is consistent with a study conducted in Ghana about the EVD vaccine trial, which analyzed the discouragements in media (Thompson, 2021). The results reveal that DHMT is a second source of information for HCWs about the EVD vaccine. In contrast, for the EVD vaccine, which was implemented in POE districts, HCWs social media was their main source of information.

The results revealed that 557 HCWs received negative information about the EVD vaccine, 137 of HCWs received information from rumor about the EVD vaccine, 276 of HCWs said the EVD vaccine has side effects, and 113 of HCWs believed that the EVD vaccine will not protect than from contacting EVD. A study conducted in the Democratic Republic of the Congo in 2021 on EVD vaccine uptake and attitudes among HCWs in North Kivu revealed that 65.7% of HCWs said the EVD vaccine has side effects (Doshi *et al.*, 2023). These results are consistent with the previous study conducted in the western democratic republic of Congo on the drivers of routine and outbreak vaccine uptake, which showed that insufficient information was given about EVD vaccine (Peckeu-abboud *et al.*, 2022) . A previous study found that vaccine coverage was lower in states where safety concerns, misinformation, and conspiracies made up a higher proportion of exposure, implying that negative representation of vaccines in social media may influence vaccine acceptance (Kummervold *et al.*, 2017). The previous study conducted in the Democratic Republic of Congo in 2018 found that 76% of H UNCWs recognize the importance of the EVD vaccine as the primary preventative measure against EVD

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transmission (Claude, Sawatzky and Hawkes, 2019).

A previous study conducted in Sierra Leone on EVD vaccine demand on a national household survey during the outbreak in 2014 shows that 60% of the respondents who had attained secondary school education express higher interest in EVD vaccine (Jalloh *et al.*, 2024). This study revealed that 64 and 667 of the respondents had attained non-university and university education, respectively; they expressed lower interest in EVD vaccine uptake. The result shows that all HFs were not reached by the mobile team for EVD vaccination (See supplementary material). The previous study done in the Western Democratic Republic of Congo showed that 20% of the respondents have problems with vaccine distribution (Peckeu-abboud *et al.*, 2022). Most of the HCWs in this research were not vaccinated, 541, and 190 indicate those HCWs who took the EVD vaccine. Our result is consistent with a study conducted in the United States on vaccination hesitancy: fear, trust, and exposure expectancy of an EVD outbreak revealed that there was EVD vaccine hesitancy among the members within the community (Mesch and Schwirian, 2019).

This study revealed a knowledge gap among HCWs in the confirmation of EVD-positive cases. Only 450 of HCWs said they can confirm EVD positive cases through laboratory. (See supplementary material). According to WHO, EVD-positive cases can only be confirmed through laboratory test (Laupland and Frost, 2015). During EVD vaccine implementation, the intention of MOHS and WHO in 2021-2022 is to vaccinate all HCWs in high-risk districts (POE districts) in Sierra Leone. It is important for MOHS, and development partners should provide strategies to ensure all the HCWs are vaccinated with Adz26ebov and MVA-BN-Filo. Previous studies have shown that Adz26ebov and MVA-BN-Filo function as prime boosts, providing durable immunity with a good safety and tolerability profile (Shukarev *et al.*, 2017).

DHMT being the administrative head of all medical services within the district, should improve on the recommendations made by HCWs.

The main limitation is that the results may be context-specific to Port of Entry (POE) Sierra Leone and hence not be directly applicable to healthcare professionals in different regions.

Conclusion

This study reveals high EVD vaccine hesitancy among HCWs in Sierra Leone

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POE district from 2021–2022, with only 190 HCWs vaccinated, and 541 of HCWs not vaccinated (supplementary material Table 3). DHMT provides vaccination strategies, by dividing the entire district into zonals, allocating mobile teams to each zone to reach all the HFs, activating outreach services, improving the cold chain for vaccine distribution, and scheduling specific times for the vaccination of HCWs to improve vaccine uptake.

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Declarations

Ethics approval and consent to participate

The Sierra Leone Ethic and Scientific Review Committee (SLESRC) provided ethical clearance for this study under the reference number SLESRC: 013/11/2023. A consent form was given to all participants to read and understand before the process started.

Consent for publication

All the authors have read and approved the final manuscript.

Competing interests

The authors declare that they have no competing interests.

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Data availability

This research data is available in KOBO COLLECT TOOL BOX and supplementary document

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