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EXAMINING THE PERCEPTION AND ATTITUDES TOWARDS COVID-19 PROTOCOL AND VACCINATION IN GOMBE TOWN, GOMBE STATE, NIGERIA

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Abstract

This research was carried out in Gombe being one of the most affected states in northern Nigeria with respect to Covid–19. The study focused on examining the perception and attitudes of people towards covid-19 protocol and vaccination in Gombe town, Gombe state, Nigeria. 384 questionnaires were administered and 341 were returned and used for analysis. Examination of the mean scores of the likert scales indicated that most respondents believe that Covid-19 is real (mean score = 1.70) but that it is not as fatal as it is portrayed (mean score = 2.22). This may be related to the fact that most respondents have not known anyone infected in the disease personally (mean score = 3.21). The principal component analysis extracted six components that aligned with several of the Covid-19 protocol mandates and vaccination. For example, component 1 comprised variables that indicated that there is a poor perception of Covid-19 protocols among the people. Component 2 contained variables that sow people have poor attitudes towards wearing of face masks and component 6 had only one variable, which is the vaccination variable. The mean score of this variable indicated that many people are opposed to receiving the vaccine even when they can access it. The study also found that people's willingness to receive the Covid-19 vaccine is not related to age and sex but educational attainment. Those with high level of education (Secondary school or higher) were more significantly willing to take the vaccine than those that did not have a formal education or had only primary education. The study recommends that new concerted efforts be put in by the government and religious organizations to refocus the perception of the public towards the danger that Covid-19 still poses in the society.

Keywords: **Covid-19, Perceptions, Attitudes, Protocol, Vaccines**

1. Introduction

Nigeria is already officially in the third wave of the Coronavirus (Covid-19) pandemic that has swept over the entire world and affected the social and economic fabrics of almost all human societies. In many of the developed countries of the world, the impact of Covid-19 has been devastating. The fatalities in the United States of America (USA), Italy, the UK and many other developed countries are in hundreds of thousands and infection is still spreading very fast. In some of the developing countries such as India and Brazil the fatalities are also severe. In Africa, however, the reported fatality and infection rates are relatively milder. South Africa, Egypt, Algeria and Nigeria are the leading countries in regards to infection and fatalities. Across the continent, 3.3 million infections and 82,601 deaths had

been reported as at 21st January 2021 (Gebresadik, Gebremichael & Belete, 2021). Compared to other parts of the world, the figures are relatively mild, considering the weak health system that permeates the entire continent.

Nigeria was a particularly worrying prospects at the beginning of the pandemic. There were many predictions of potential catastrophic consequences, which so far does not appear to have panned out. Nevertheless, the country is not yet out of the woods. The first wave of the pandemic necessitated lockdowns in many states and cities, with serious economic and social consequences. The second wave did not attract as much attention, probably because the apocalyptic predictions that accompanied the first wave did not eventually come true. The current third wave also appears to be getting similar treatment by the general public even as the number of reported daily infection and fatality cases are stacking up.

Like most infectious diseases, prevention is the first line of defense. The World Health Organization (WHO) has outlined several non-pharmaceutical measures to prevent the spread of the disease. These are popularly known as the Covid-19 Protocol. These include social distancing, regular washing of hands with soap and application of hand sanitizer, the use of face masks and non-travel restrictions. It may be acknowledged that this protocol, if fully implemented may considerably slow the spread of the disease but may not stop it completely (Hellewell, Abbott, Gimma, et al., 2020; Snoeck, Vaillant, Abdelrahman, et al., 2020). Recent successes in the development of anti-Covid-19 is aimed at reducing or eliminating the burden of the disease (Andre, Booy, Bock, Clemens, Datta, John, et al. (2008). The success of this double strategy (Covid-19 protocol and vaccination) however, lies in the adoption of these practices by the general public (Neumann-Böhme, Varghese, Sabat, Barros, Brouwer, van Exel, et al., 2020). The attitudes of the general public towards Covid-19 and the protocol is at the heart of the preventive strategy.

Gombe state is one of the states that has reported relatively large number of Covid-19 infections and deaths in the northern part of Nigeria. Since 27th February, 2020 when the first case was reported, Gombe state has recorded 2,228 infections and 34 deaths as at July 2021 (NCDC, 2021). This ranks it seventeenth and fourteenth in infections and deaths, nationally, including the Federal Capital Territory (FCT), Abuja, but seventh and fourth among the 19 northern states in Nigeria. Most of these infections and deaths were recorded within Gombe town, which is the largest settlement in the state. An interesting Covid-19 related event took place in Gombe town during the first wave lockdown that drew national attention. In one of the isolation units, it was widely reported that the people in quarantine embarked on a strike action, requesting the government to end their isolation. Interestingly, there were joined by many people from the general public who did not wear any face masks and neither observed the recommended social distancing and other source of information. This was a worrisome development, which underscored the need to examine the attitudes of the people towards the Covid-19 protocol. Though several studies have been undertaken in many parts of the world and in some parts of Nigeria, there is no evidence so far that a study has been undertaken to assess the attitudes of people in Gombe town towards Covid-19 protocol. Therefore, the study attempts to provide a better understanding on the perception and attitudes of people towards Covid-19 protocol

and vaccination in Gombe town, Gombe state, Nigeria.

2. Methodology

2.1 Study Area and Research Design

Gombe town is located in the north-eastern part of Nigeria. It is situated at the latitude 10^0 19^1 N and 10^0 20^1 N and latitude 11^0 01^1E and $11^0$$19^1$E of the Greenwich Meridian. It shares common boundry with Akko local government area to the south and west, Yamaltu-Deba local government area to the east. There are eleven (11) major wards in Gombe town, namely; Ajiya,Bajoga, Bolari, west, Bolari east, Dawaki, Herwagana, Jekadafari, Kumbiya kumbiya, Nasarawo, Pantami and Shamaki wards respectively. A descriptive survey design was adopted for the study. This involved the use of a structured questionnaire to capture the knowledge, attitudes and practices of people towards Covid-19 and the non-pharmaceutical preventive measures (protocol). There were three sections in the questionnaire. The first section sought information on the socioeconomic and demographic characteristics of respondents. This include data on age, sex, educational levels and occupation of respondents. The second section contained statements with likert scale-like options that ranged from strongly agree (1 point) to strongly disagree (4 points). Agree and disagree had 2 and 3 points respectively. Each of four non-pharmaceutical measures had several questions that elicited information from respondents. Other statements were included to gauge the knowledge and perceptions of people towards Covid-19.

2.2 Study Population and Sample Size Determination

The study was conducted in Gombe town, the state capital of Gombe State. It is the largest town in the state with an estimated population of 261, 536 (NPC, 2016). The target population for the study, however, is the adult population (18 years and above) of the town only. This is to allow for consent in providing information for the state but also because the bulk of world attention has been on the adult population, which are the most vulnerable to Covid-19. Since the population of the adults in Gombe town is not known, the study adopted the following formula to derive a statistical sample size (Israel, 1992):

$$Sample\ size = \frac{Z^2 pq}{me^2}$$

Where Z = Z-score value for level of significance (0.05), which is 1.96; p = proportion of those who have adopted the protocol (since the proportion is not known, it is assumed at 50%, which is 0.5); p = 1 – p; and me is the margin of error, here assume at 5%, which is 0.05.

$$Sample\ size = \frac{1.96^2 * 0.5 * 0.5}{0.05^2} = 384$$

2.3 Data Collection

A total of 384 questionnaires were distributed in Gombe town in June and July 2021. First, Gombe town was stratified into eleven wards where thirty five (35) copies of questionnaires were administered in each of the eleven (11) wards in the study area. Six undergraduate students (three female and three male) of Federal University, Kashere, were recruited as field assistants and trained in questionnaire administration and data collection techniques. They worked in pairs and were supervised by the researcher. They all observed the Covid-19 protocol in the course of data collection. At the end of data collection, 341 questionnaires were returned correctly filled (89% response rate) and was used in the study.

2.4 Statistical Analysis

The data were first entered in Microsoft Excel and then imported into the IBM SPSS (Statistical Package for Social Sciences), version 23 for analysis. Descriptive statistics were employed to describe the data distribution including mean and standard deviation for responses provided. The mean scores of items were described using a classification scheme derived from the following formula (Shaffril, Hamzah, Yassin, Samah, D'Silva, Tiraieyari & Muhammad, 2015):

$$Class\ Interval = \frac{Maximum\ likert\ scale\ value - Minimum\ likert\ scale\ value}{Number\ of\ likert\ scale\ classes}$$
$$= \frac{4-1}{4}$$
$$= 0.75$$

Table 1 shows the classification scheme for the mean scores:

Table 1: Classification Scheme for Mean Scores

Classes	
1.00 - 1.75	Strongly Agreed
1.76 - 2.50	Agreed
2.51 - 3.25	Disagreed
3.25 - 4.00	Strongly Disagreed

This means that respondents are considered to have strongly agreed with items whose mean score values that fall between 1 and 1.75 and strongly disagreed with items with mean score values between 3.25 and 4.00.

The Principal Component Analysis (PCA) was used to determine important components of the responses that can provide a better understanding of the attitude of the general public towards Covid-19 protocol. The data components are extracted based on eigen values of 1 and above, with a maximum iteration of twenty-five for convergence. The varimax rotation, with rotated solutions and loading plots were also applied. The option to suppress small coefficients of less than 0.30. An ordinal regression analysis is then employed to model several factors that have significant relationship with attitudes. The level of significance adopted is 0.05% at 95% confidence interval.

3. Results and Discussion

3.1 Socio-Economic and Demographic Characteristics

Table 2 presents the socioeconomic and demographic characteristics of the respondents. About 74% of the respondents are below the age of 40, which shows that they are young. It is a fact that most of the people that have been most adversely affected by Covid-19 are the elderly and those with underlying health issues.

Table 2: Socioeconomic and Demographic Characteristics of Respondents

Variable		Frequency	Percent
Age	Less than 20	31	9.09
	20 – 29	111	32.55
	30 – 39	112	32.84
	40 – 49	41	12.02
	50 – 59	28	8.21
	60 +	18	5.28
Sex	Female	145	42.52
	Male	196	57.48
Education	Informal	23	6.74
	Primary	110	32.26
	Secondary	192	56.30
	Tertiary	11	3.23

Source: Field work, 2020

This group of persons are also usually less mobile and therefore less able to spread the disease as fast as the mobile and socially-oriented young persons. The preventative protocols are therefore appropriate for all age groups as the old people require it to prevent infection and ill-health due to age, the young people who are most likely to be infected without showing symptoms or becoming ill but very capable of spreading it also need to abide by the protocols to reduce or mitigate the spread of the disease. Expectedly, there are more male respondents than female respondents. This is only a reflection of the society where the male population is more likely to be encountered and willing to engage than the female population. About 43% participation by the female population is considered high. The recruitment of female field assistants was aimed at achieving high female responses.

Most respondents have had at least primary school education or higher (93%). Sixty (6)) percent have either secondary or tertiary educational qualification, which suggests that most of the respondents are knowledgeable and informed about the disease and the covid-19 protocols. Awareness is an important pre-requisite even if not a sufficient condition for the adoption of any policy or practice (Ju & Lo, 2014). Education usually plays an important role in both awareness and adoption (Gebresadik, Gebremichael & Belete, 2021).

3.2 Perception and Attitude towards Covid-19

Table 3 shows the Mean scores and standard deviation of respondents computed and discussed. Using the classification scheme in

Table 1, and the result in Table 3, it shows that there is a strong agreement that covid-19 is curable, with a mean score value of 1.70.

Table 3: Mean scores and standard deviation of Respondents.

Item	Mean	Std. Deviation	Analysis N
COVID-19 is real	1.87	0.80	341
COVID-19 is not as fatal as being portrayed	2.22	1.02	341
COVID-19 is a punishment from God for our sins	2.29	1.00	341
COVID-19 is sign of End Times	1.96	0.87	341
COVID-19 is a government ruse to steal money	1.99	0.99	341
COVID-19 is curable	1.70	0.78	341
Black people (Africans) are immune to COVID-19	2.28	1.05	341
I always wear my mask when I am in Church/Mosque at all times	2.73	0.80	341
I always wear my mask at the marketplace at all times	2.86	0.79	341
I always wear my mask at work all the time	2.87	0.74	341
I always wear my mask when I join the taxi/bus at all times	2.83	0.72	341
I always wear my mask at home when I have visitors	3.03	0.64	341
I shake hands with strangers or people I just met	2.43	0.84	341
I shake hands with relatives, friends or people I know	2.27	0.80	341
I always keep a distance of at least 6ft from strangers	2.58	0.94	341
I always keep a distance of at least 6ft from friends/relatives	2.87	0.78	341
I wash my hands with water and soap regularly every day	1.99	0.84	341
I use hand sanitizer regularly every day	2.22	0.96	341
I apply hand sanitizer whenever I shake hands with others	2.68	0.83	341
I do not touch my face with my hands unless I wash or sanitize them	2.48	0.89	341
Only old people or those with underlying diseases die from COVID-19	2.78	0.83	341
I know at least one person in my family/community/office who had COVID-19	3.21	0.80	341
I have never seen a COVID-19 patient so I do not believe it is real	2.60	1.01	341
Lockdown will not stop the spread of COVID-19 so it is not necessary	2.17	1.03	341
COVID-19 is not a problem anymore since a vaccine has been found	2.41	1.02	341
COVID-19 protocol is not necessary anymore because there is now a vaccine	2.66	0.95	341
I will take the COVID-19 vaccine when it becomes available	2.83	0.99	341

This is an interesting finding because there is as yet, no known cure for Covid-19. At a philosophical level, it may be argued that all diseases are curable only that the actual cure has not yet been discovered. Technically, however, unless a cure has been found, the disease is considered not curable as the case is currently with Covid-19. In the inverse, most respondents indicated that they do not know any person in their families or community or

office who has contracted Covid-19 (Mean score of 3.21).

Other statements that respondents felt strongly about include the fact that Covid-19 is real (mean score = 1.89); Covid-19 is a sign of the End times (apocalypse) (mean score = 1.96) and that it is a ruse for the government to steal money (mean score = 1.99). These are important perceptual issues about Covid-19. The fact that most respondents believe that Covid-19 is real is important. But equally important is the perception that it is not as deadly as has been portrayed (mean score = 2.22) and the report that most respondents claimed they have not known any person with the disease. These probably explain why many respondents deem it a ruse by the government to steal public money. In this case, there appears to be a public trust deficit, which may not be divorced from the much talked about corruption in the country. Petravic *et al* (2021) also found a lot of distrust of the Slovenian government by the respondents in regards of Covid-19. There is also an apparently strong theological outlook on Covid-19. Many respondents think it is an apocalyptic sign of the world coming to an end and a punishment from God (mean score = 2.29).

In regards of attitudes towards the Covid-19 non-pharmaceutical preventive protocols, there appears to be a poor attitude towards abiding by them. Regular washing of hands with soap (mean score = 1.99 and use of hand sanitizer (mean score = 2.22) are the two Covid-19 protocol measures most commonly adhered to. Wearing of face masks and social distancing do not appear to be favoured. Most respondents do not wear their face mask at home even when they are hosting visitors (mean score = 3.03); or at church/mosque (mean score = 2.76), at work (mean score = 2.87), market place (mean score = 2.86) or in public transport (2.83). These measures appear to be the least adhered to. For social distancing, many respondents agree that they shake hands with strangers (mean score = 2.43), and with friends and relatives (mean score = 2.27). Shaking hands require that people come in close proximity with one another, which signifies the absence of recommended social distancing. Generally, respondents did not keep to the 6 ft minimum distance from others. More respondents indicated that they kept distances of at least 6 ft from strangers (mean score = 2.58) but not from friends and relatives (mean score = 2.87).

The poor attitude reported by respondents towards the Covid-19 protocol is a finding that is different from those reported by Reuben et al (2020) in North-Central Nigeria, Erfani A, Shahriarirad, Ranjbar, Mirahmadizadeh and Moghadami (2020) in Iran where upwards of 80% of both study populations displayed positive attitudes. Both studies however engaged a highly educated population where more than 80% of respondents had tertiary degrees (Bachelor's or higher). The timing of the studies may also be instructional.

The studies were conducted when Covid-19 pandemic was probably at its peak and many people were cautious and fearful of the new disease. This study, in contrast, is conducted after what may be referred to as the "prime time" of Covid-19 even though the world is still in the grip of the disease and its variants, especially the Delta variant that appears to be causing upsurges in cases and deaths in many parts of the world, including Nigeria. It appears that many people in the study area are of the conviction that the worst of Covid-19

has been experienced. Though many people do not appear to comply with the Covid-19 protocols, there is a mild agreement that the protocols may still be relevant and necessary (mean score = 2.66) even when many think the threat of Covid-19 is a less potent danger now that a vaccine has been found (mean score = 2.41). A lockdown is however not acceptable as there is a general agreement that it will not help stop the spread of Covid-19 and should not, therefore, be contemplated (mean score = 2.17).

3.3 Extraction of Components

The Kaiser-Meyer-Olkin (KMO) and Barlett's tests (Table 4) indicate that the correlation matrix of the variables is not an identity matrix and therefore may be subjected to a principal component analysis (PCA). A KMO test value of or greater than 0.6 is a condition that need to be met in order to employ the PCA method. Barlett's test of sphericity is also significant (p-value = 0.000), which shows that the correlation matrix is not an identity matrix and therefore a PCA may be used to analyse the data.

Table 4: KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.711
Bartlett's Test of Sphericity	Approx. Chi-Square	2354.382
	Df	253
	Sig.	0.000

The principal component analysis test conducted extracted six components, with eigen values above 1, from the twenty seven variables in consideration. The components explain 62% of total variances within the variables. The first two components have loadings of 17% and 15%. The remaining components have loadings that ranged between 4% and 8%.

Component 1 is the perception (knowledge gap) component and comprises of six variables: black people are immune to Covid-19 (0.771), COVID-19 is a government ruse to steal money (0.742), COVID-19 is not as fatal as being portrayed (0.741), COVID-19 is not a problem anymore since a vaccine has been found (0.662), Lockdown will not stop the spread of COVID-19 so it is not necessary (0.590), and COVID-19 protocol is not necessary anymore because there is now a vaccine (0.503). These variables correspond with general perceptions in the public domain and especially in social media circles, which are not correct and have been generally debunked. For example, there is no truth in the belief that black people are immune to Covid-19 because one of the most affected groups in the US is the black population. According to statistics from the Center for Diseases Control and Prevention (CDC) of the United States (CDC, 2021), black population in the US were 1.1 times, 2.8 times and 2.0 times more likely to be infected, hospitalized and to die from

Covid-19, respectively, than the White, non-Hispanic population in the US. Unfortunately, these miscommunications and misleading pieces of information are easily spread by word of mouth and telecommunication devices such as the ubiquitous smartphones. Other variables in this group have equally been debunked but apparently many people in Gombe still believe them. This means that there is, probably, a knowledge gap, which may be at the root of their perception and attitude towards Covid-19 and the preventive protocol.

Component 2 is the face mask component: I always wear my mask at work all the time (0.820), I always wear my mask when I join the taxi/bus at all times (0.732), I always wear my mask at the marketplace at all times (0.716), I always wear my mask when I am in Church/Mosque at all times (0.671) and I always wear my mask at home when I have visitors (0.570). The variables in this component demonstrate the poor attitude of people in Gombe town towards wearing of face masks. Most respondents have a nonchalant attitude to wearing their face masks at work, market place, church/mosque or at home at all times.

Component 3 is the sanitation component: I wash my hands with water and soap regularly every day (0.824), I use hand sanitizer regularly every day (0.793) and I always keep a distance of at least 6ft from strangers (0.526). Social distancing component is component 4: I always keep a distance of at least 6ft from friends/relatives (0.730) and I apply hand sanitizer whenever I shake hands with others (0.590). Component 5 is the knowledge component: Covid-19 is real (0.700) and Covid-19 is curable (0,642). The vaccination component: I will take the COVID-19 vaccine when it becomes available (0.855) and the trust component: I shake hands with relatives, friends or people I know (0.825). The vaccination component comprises of one variable, he mean score (2.89) of which signals a vaccine hesitancy among the respondents. The mean score falls within the class of "disagree," which means that people generally disagreed with the statement that they would take the Covid-19 vaccine when it becomes available to them.

The extracted components confirm the general negative attitude of the people of Gombe to Covid-19 protocols. Several studies align with several of these findings on negative attitudes of people towards Covid-19 protocols. For example, Kebede, Yitayih, Birhanu, Mekonen, Ambelu and Tu (2020) in Ethiopia and Alzoubi, Alnawaiseh, Al-Mnayyis, Lubad, Aqel and Al- Shagahin (2020) in Jordan reported similar attitudes such as non-wearing of face masks, non-compliance with social distancing requirements and non-avoidance of crowded areas.

3.4 Hypothesis Testing

Ordinal regression analysis was performed to test the hypotheses that the intention to take the Covid-19 vaccine when available is related to the socioeconomic characteristics of respondents. Table 5 presents a summary of the results. The model fitting information shows that the model is significant (p-value = 0.031), which is less than the 0.05 level of significance.

Table 5: Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	341.774			
Final	321.947	19.828	10	0.031

The Pearson and deviance values for goodness-of-fit are 0.171 and 0.172 respective, both of which are greater than level of significance at 0.05. This means that the model is a good fit for the data. The Pseudo-R Square value of 0.684 (Nagerkelke) is considered of good explanatory power. Table 6 presents a summary of the ordinal regression analyses conducted.

Table 6: Ordinal Regression Result

					95% Confidence Interval	
	Estimate	Std. Error	Wald	Sig.	Lower Bound	Upper Bound
[Age = Less than 20]	-.332	.599	.307	.579	-1.505	.841
[Age = 20-29]	-.907	.489	3.440	.064	-1.865	.051
[Age = 30-39]	-.086	.480	.032	.858	-1.025	.854
[Age = 40-49]	-.347	.537	.418	.518	-1.399	.705
[Age = 50-59]	-.153	.579	.070	.792	-1.288	.982
[Age = 60+]	0[a]					
[Sex = Female]	-.230	.215	1.144	.285	-.650	.191
[Sex = Male]	0[a]					
[Education= Informal]	1.377	.921	2.236	.135	-.428	3.182
[Education = Primary]	1.514	.848	3.183	.074	.337	4.320
[Education = Secondary]	2.328	1.016	5.249	.022	.337	4.320
[Education = Tertiary]	1.742	.843	4.268	.039	.089	3.394

Results (Table 6) show that age and sex of respondents are not related with the willingness to receive the Covid-19 vaccine when it becomes available to all people. This is not exactly surprising in light of the fact that many respondents indicated unwillingness to receive the vaccine (mean score = 2.89), which is in line with the findings of Reuben, Danladi, Saleh and Ejembi (2020) about the unwillingness of people in North-Central Nigeria to receive the Covid-19 vaccine when it became available. None of the age groupings or sex classes in this study showed any significance. Education, however, presented some more interesting findings. There is a significant relationship between the

willingness of respondents to receive the Covid-19 and their levels of educational attainment. Results show that respondents who had secondary and tertiary education indicated more willingness to receive the vaccine. These findings are in contrast with the findings of a study conducted in Slovenia, where Petravic, Arh, Gabrovec, Jazbec, Rupcˇic, Starešinic, et al. (2021) found that age and sex characteristics of respondents were significant predictors of willingness to receive the Covid-19 vaccine, while there appeared to be a vaccine hesitancy with the more highly educated.

4. Conclusion

It's evidently clear that there's a poor attitudes towards the Covid-19 protocol and intention to vaccinate against the disease in Gombe town. The face mask and social distancing mandates are the most breached aspects of the Covid-19 protocol. There appears to be a high sense that Covid-19 has lost its danger potency despite the new wave of increases in infections and deaths across the country. Some of these attitudinal misgivings towards the disease may be as a result of misinformation and misrepresentations about the disease in the public domain, which appear to have affected the perceptions of the people. Though the belief that the disease is real is well-professed by the people, there are several conspiracy-like ideas that have settled in the minds of the people such as Covid-19 being a punishment from God and a ruse by the government to steal money. Also, of recent, there has been pictures, videos and so-called testimonials on the danger of receiving the Covid-19 in the social media especially, but which the general public has become aware of. These are worrisome and call for quick intervention. Unless these are adequately and promptly contained, they possess the capacity to derail the efforts to stop Covid-19 in its tracks.

5. Recommendations

There is a need for the government, community and religious leaders to reassert concerted efforts to refocus on the perceptions and attitudes of people towards Covid-19, the Covid-19 protocols and vaccination and to educate and enlighten the people on the fact that Covid-19 is still a current and real threat to life and the well-being of the people and country.

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