



Comparison of Two Accelerated Vaccination Campaigns Against COVID-19; from 16 to 31 December 2021 and from 23 February to 13 March 2022 in the Republic of Guinea

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Abstract: *Introduction:* COVID-19 is an infectious respiratory disease that can be fatal in patients weakened by age or another chronic illness. Several means have been used to prevent this disease, including vaccination against COVID-19, which has also enabled us to protect the population against COVID-19. It began on 4 March 2021 in Guinea with front-line staff, with vulnerable people, those aged 60 and over, being the first beneficiaries. The low vaccination coverage of 3.5% led the Ministry of Health to organize two campaigns to accelerate vaccination against COVID-19 throughout the country. The first ran from 16 to 31 December 2021 and the second from 23 February to 13 March 2022. The aim of our study was to compare these two accelerated vaccination campaigns against COVID-19 to check whether all the recommendations had been considered. *Methodology:* This was a retrospective, analytical, cross-sectional study comparing two accelerated vaccination campaigns against COVID-19, carried out from 10 August to 20 September 2022 and involving all vaccinated persons entered in the DHIS2 software during the two accelerated vaccination campaigns against COVID-19: organized from 16 to 31 December 2021 and from 23 February to 13 March 2022 in the Republic of Guinea. The data collected in the two COVID-19 vaccination databases were exported using Excel and analyzed using SPSS version 24. *Results:* Our study enabled us to deduce that during the second campaign, vaccination coverage statistically doubled, that there was more vaccine available with the introduction of a new vaccine (Moderna), and that more MAPIs were notified (627) compared with (269) during the first campaign, all of which were light. The seizure rate was 23% compared with 13% in the first campaign. *Conclusion:* At the end of our study, we found that during the second campaign: Vaccination coverage improved, the number of MAPIs notified increased, the number of vaccines was more available in terms of quality and quantity, and there was an improvement in data entry. These results will enable us to prepare better for future campaigns.

Keywords: Campaign, Vaccination, COVID-19, Comparison, Guinea

1. Introduction

COVID-19 was first identified in Wuhan, China, in December 2019. On 30 January 2020, the World Health Organization (WHO) declared COVID-19 a public health emergency of global concern [1]. Coronaviruses are enveloped, positive, single-stranded, large ribonucleic acid (RNA) viruses that infect humans as well as a wide range of animals [2]. The average incubation period is around 5 days, ranging from 1 to 14 days, and 95% of patients are likely to develop symptoms within 12 days of contact. However, asymptomatic carriers have been reported with an incubation period of 19 days, suggesting the complicated challenge of containing this disease [3]. Highly contagious, the virus spread around the world in a short space of time, and on 11 March 2020 the disease was declared a global pandemic by the WHO [4].

In India: Although two million patients have been cured, this disease remains an unknown and uncontrolled mystery [5].

Vaccination against COVID-19 is a measure that can protect the population against an epidemic [6] and could save lives. It offers strong protection against severe forms of the disease, hospitalization and death. There is also evidence that being vaccinated reduces the risk of transmitting the virus to others, which means that the decision to be vaccinated also protects those around us [7].

As of 9 June 2021, almost one billion people worldwide have received at least a first dose of the COVID-19 vaccine, corresponding to 11.62% of the world's population. Vaccination coverage in the United States of America was 66% [8]. Nearly 20% of the European population had been fully vaccinated, while only 2% of the African population had received at least one dose, and a few countries had not yet begun their COVID-19 vaccination campaign [9].

According to the literature, the United States has a vaccination rate against COVID-19 of more than 67.21% [2]. In Europe, this rate varied between 79.97% in France and 76.15% in Belgium on 14 July 2022 [10].

In developing countries, the COVID-19 epidemic has disrupted already fragile healthcare systems [11].

In Africa, many countries have adopted vaccination against COVID-19. This has made it possible to limit the incidence rate and the case-fatality rate. However, vaccination coverage is still low compared with Europe. It is higher in the Seychelles (82.09%) and Mauritius (74.35%) than in Morocco (63.5%) [9].

Vaccination against COVID-19 increased by 15% between January and February 2022, with several countries organizing mass vaccination campaigns to increase coverage and protect people against the harmful effects of the virus on health [12].

According to figures from the Johns Hopkins University Baltimore, USA, Morocco is the most advanced country on the continent in its vaccination campaign. As of 15 January 2022, the country had injected 51,321,365 doses of vaccine. More than 23 million Moroccans are now fully vaccinated, representing 63.31% of the population, compared with 52% in

Tunisia.

West Africa is still struggling with COVID-19 vaccination. Vaccination coverage in Liberia is 42.11%; Guinea Bissau 17.39% [2]; Mali has vaccinated 10.13% of its population, compared with 6% in Senegal [13].

In view of the factual evidence that vaccination is an effective means of protecting the population against COVID-19, Guinea, through the National Agency de Security Sanitaire (ANSS) and the Expanded Programme on Immunization (PEV) of the Ministry de la health et de public health (MSHP), has drawn up a national plan to introduce vaccination against COVID-19 with the support of technical and financial partners in the health sector [14].

Vaccination against COVID-19 complements the various strategies already undertaken to combat COVID-19. The main objective of this vaccination strategy is to stop the COVID-19 pandemic and its consequences on the lives of the population, the healthcare system, and the economy in Guinea by 31 December 2022 [12]. Vaccination using the "targeted vaccination" strategy began on 4 March 2021. Front-line staff, vulnerable people and those aged 60 and over were the first beneficiaries. The initial focus was on the Conakry special zone (18 vaccination sites) and the administrative regions (07 vaccination sites).

Administrative regions (07 sites) before being decentralized to all prefectures, followed by vaccination of the 18 and over and 12 to 17 age groups. By 2 May 2021, 95,312 people had received their first doses of vaccine, and 48,222 had received both doses [15]. By September 2021, vaccination coverage of the total population was estimated at 3.5% [16].

The failure to reach the WHO target of 10% vaccination coverage of the total population by the end of September 2021, the insufficient use of COVID-19 vaccine (300,000 doses consumed per month) between March and September 2021, and the problem of financing the operational costs of vaccination [14] are some of the reasons why the Ministry of Health has decided to step up vaccination by organizing two campaigns to accelerate vaccination against COVID-19 throughout the country. The first ran from 16 to 31 December 2021 and the second from 23 February to 13 March 2022.

During this first campaign, 98942 people were vaccinated and entered in the DHIS2, giving a vaccination coverage of 6% [17].

However, several shortcomings were reported during the first campaign.

1. Vaccine shortages in some regions,
2. Under-notification of MAPIs,
3. Failure to respect the time interval between doses,
4. Low number of people vaccinated compared to the target (6% vaccine coverage),
5. Low rate of data entry into the DHIS2 software,
6. Inadequate communication,
7. Failure to respect the time between the two campaigns,
8. Failure to involve the community in decision-making,
9. Poor social mobilization,

10. Delays and sometimes non-payment of vaccinators and data entry agents [17].

Given the difficulties and weaknesses identified during this campaign, a plan to resolve the difficulties was drawn up and a second accelerated immunization campaign was organized for the period from 23 February to 13 March 2022.

To obtain information on the level of change in indicators between the first accelerated vaccination campaign against COVID-19 (16 to 31 December 2021) and the second campaign (23 February to 13 March 2022), we decided to carry out a comparative analysis of these two campaigns. Hence the reason for our choice to carry out this study.

2. Objectives of the Study

2.1. General Objective

To compare the results of the two accelerated vaccination campaigns against COVID-19 organized from 16 to 31 December 2021 and from 23 February to 13 March 2022.

2.2. Specific Objectives

1. To determine the vaccination coverage of each vaccination campaign.
2. Determine the types of vaccine available against COVID-19 at the start and end of each campaign.
3. Identify the types of IBD notified in the second

campaign compared with the first.

4. Analyze the data capture rate for each accelerated campaign.

3. Methodology

3.1. Study Framework

The Republic of Guinea is in West Africa. It is bordered by Guinea Bissau to the north-west, Senegal and Mali to the north, Côte d'Ivoire and Mali to the east, Liberia and Sierra Leone to the south and the Atlantic Ocean to the west. The country is bordered by 300 km of coastline, stretching 800 km from east to west and 500 km from north to south. It has a total surface area of 245,857 km².

It has a tropical climate, with alternating rainy and dry seasons, each lasting around six months. The climate exposes the country to the constant risk of floods, harmattan winds and fires in the dry season, particularly in Upper Guinea.

Guinea comprises 8 administrative regions: Conakry, Kindia, Boké, Mamou, Labé, Kankan, Faranah and Nzérékoré.

According to the 2014 General Census of Population and Housing, the total population of Guinea at the time was 10,628,972 with a density of approximately 43 inhabitants per km². Based on a natural growth rate of 2.9%, the population of Guinea is estimated to be 12,907,395 in 2021.

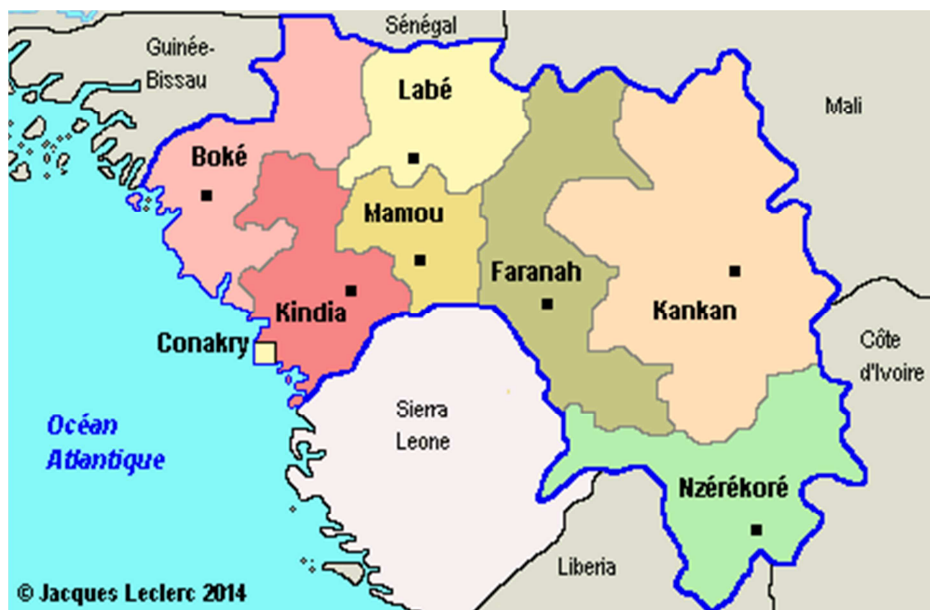


Figure 1. Map of the Republic of Guinea (Source: Google).

3.2. Type of Study

This was a retrospective analytical cross-sectional study comparing two vaccination campaigns.

3.3. Duration of the Study

This study was carried out from 10 August to 20

September 2022.

3.4. Study Population

All vaccinated persons entered in the DHIS2 during the two accelerated vaccination campaigns against COVID-19: from 16 to 31 December 2021 and from 23 February to 13 March 2022 in Guinea.

3.5. Selection Criteria

3.5.1. Inclusion Criteria

Were included in this study, vaccinated persons with complete information having taken at least one dose of COVID 19 vaccination entered in DHIS2.

3.5.2. Non-Inclusion Criteria

We're not included, all cases entered in the DHIS2 software, whose information was not complete on our variables to be studied.

3.6. Sampling and Sampling Technique

We used purposive sampling, which consisted of selecting only those people who had been vaccinated and registered in the DHIS2 software and whose information was complete.

3.7. Data Collection Technique

The data used in our work were extracted from those produced by the data entry agents in the DHIS2 software during two accelerated vaccination campaigns against COVID-19 in Guinea, thus constituting our database.

3.8. Data Management and Analysis

Data from the two vaccination campaign databases were exported using Excel and analyzed using SPSS.

Descriptive results were presented in table and figure form.

We compared the indicators of the two accelerated vaccination campaigns (number of people vaccinated compared with the target, number of cases of MAPI notified, doses of vaccine available at the start of each vaccination campaign, number of people vaccinated entered in the DHIS2 software against COVID-19). The Pearson chi-square test was calculated to assess the difference between the two campaigns. The significance level was set at 0.05%.

4. Ethical and Deontological Aspects

We received authorization to use the databases from the ANSS, and the dissertation was submitted to the master's in public health team for approval. The data used for the dissertation were used anonymously and confidentially.

5. Results

In terms of use, more vaccines were recorded during the second campaign than the first ($p=0.000$), including Sinovac (51,503 doses compared with 300,19 doses), SINOPHARM (4,9829 doses compared with 29,227) and Johnson and Johnson (4,013 doses compared with 2,3952). In addition, the second campaign saw the use of a new vaccine, MODERNA (12,552 doses).

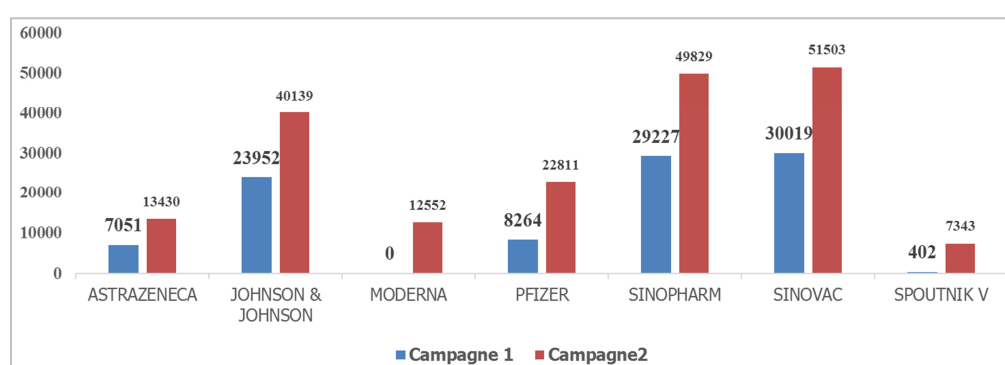


Figure 2. Availability of vaccines by antigen at the start of each campaign from 16 to 31 December 2021 and from 23 February to 13 March 2022, in the Republic of Guinea.

Overall, we found that vaccination coverage statistically doubled in the second campaign, with an $X^2=89.99$; $ddl=7$ and $p=0.000$; i.e., 12% compared with 6% in the first

campaign. The same applies to all regions: Mamou 26% versus 16%; Labé and Boké 13% versus 9% and 7% respectively (table 1).

Table 1. Breakdown of vaccination coverage by region for the two campaigns from 16 to 31 December 2021 and from 23 February to 13 March 2022 in the Republic of Guinea.

Regions	First campaign			Second campaign			Total
	Targets	Immunized	CV en %	Targets	Immunized	CV en %	
Boké	217500	15610	7,2%	217500	28896	13,2%	44506
Conakry	378750	12410	3,3%	378750	43634	11,5%	55955
Faranah	135000	5377	3,9	135000	13516	10,0%	18893
Kankan	307500	15879	5,1%	307500	24048	7,8%	39927
Kindia	277500	11953	4,30%	277500	27461	9,8%	39414
Labé	213750	18407	8,61%	213750	28207	13,1%	46614
Mamou	82000	12930	15,7	82000	21389	26,0%	34319
Nzerekore	183750	6376	3,4%	183750	11792	6,4%	18168
Total	1796250	98942	6%	1796250	198943	12%	297885

In terms of IBD, we noted an increase in the second campaign, with 627 cases compared with 249 for the first campaign (according to the summary report); the most remarkable cases

were observed in Boké, with 112 cases compared with 1. However, the only serious case was recorded in the first campaign in the same administrative region (Table 2).

Table 2. Breakdown of notified IBD cases by region and by accelerated campaign, from 16 to 31 December 2021 and from 23 February to 13 March 2022, in the Republic of Guinea.

Regions	First campaign		Second campaign	
	MAPI mineurs	MAPI Majeurs	MAPI mineurs	MAPI Majeurs
Conakry	38	0	47	0
Labé	11	0	28	0
Boké	1	1	112	0
Mamou	24	0	63	0
Kindia	27	0	14	0
Kankan	90	0	95	0
Faranah	15	0	80	0
N'Zérékoré	39	0	188	0
Total	249	1	627	0

X²=63.98; ddl=8; pv= 0.000

Data capture increased significantly (p=0.00), ddl =8 or 23% compared with 13% in the first campaign. On the other hand, it fell in the Boké region from 6% to 8% (table 3).

Table 3. Status of data entry into the DHIS2 by region during the two accelerated campaigns from 16 to 31 December 2021 and from 23 February to 13 March 2022, in the Republic of Guinea.

Regions	1 ^{ère} campagne			2 ^{ème} campagne		
	Vaccinées	Saisi DHIS2	Taux de saisie	Vaccinées	Saisi DHIS2	Taux de saisie
Conakry	103 846	12410	11,96%	201 323	43634	22%
Labé	82 598	18 407	22,28%	65211	28207	43%
Boké	171 376	15 610	9,1%	185495	28896	16%
Mamou	57 639	12 930	22,4%	45 954	21389	47%
Kindia	169941	11953	7%	218502	27461	13%
Kankan	132890	15 879	11,9%	152753	24048	16%
Faranah	53901	5 377	9,9%	67540	13517	20%
Nzerekore	78026	6 376	8,1%	186052	11792	6%
Total	850 217	98 942	11%	1 122 830	198944	23%

6. Discussion

The aim of our study was to compare two vaccination campaigns against COVID- 19 by checking whether the recommendations of the first campaign were considered during the second.

During the second campaign, we observed an increase not only in the quantity of vaccine used but also in the type. This improvement was observed not only for the quantities available at the start of the campaign but also at the end of the campaign [17].

Our data are corroborated by a study carried out in Brazzaville on adherence to vaccination against COVID-19, which showed a 15% increase between January and February [10].

This difference can be explained by the fact that rich countries, urged to vaccinate their populations in order to ensure optimal immunization coverage because of repeated outbreaks of COVID-19, had snapped up a large number of doses by placing pre-orders with laboratories even before the vaccines were approved. At the same time, low-income countries did not have the means to pay for

the vaccines [9].

Similarly, the time interval between the two campaigns, combined with an increase in vaccination coverage in the West [18] and the availability of a new vaccine (Moderna), would explain the large quantity of vaccine used during the second vaccination campaign.

In terms of vaccination coverage, we found that more people were vaccinated in the second campaign than in the first. This difference is thought to be due to the fact that during the first campaign, the population was reluctant to vaccinate because of fear of the side effects of vaccines and speculation, [19] and to the improved availability of vaccines during the second campaign. In a study carried out by WHO on the side-effects of COVID-19 vaccines, it was found that fear of side-effects was the main cause of reluctance [20].

This increase in all the administrative regions of the Republic of Guinea can be explained by:

1. Strong involvement of the political and administrative authorities in the implementation of the second campaign,
2. The compulsory health pass for all adults during this period,

3. The strengthening of social mobilization,
4. The timely provision of funds for vaccinators during the second round of the accelerated COVID-19 vaccination campaign,
5. An increase in the number of vaccinators in these regions [17].

As regards data entry, the number of vaccinated persons entered in the DHIS2 software increased during the second campaign. This can be explained by the organization of retrospection, the obligation to obtain the Vaccination Pass required by the State and the strengthening of supervision/monitoring of data entry agents. On the other hand, during the first campaign, the number of data entry agents was relatively small; connection credits and tablets for data entry agents were not available in time.

It was only in Nzerekore that we saw a decline in data entry. This would be due to the fact that the shortcomings of the first data entry campaign were not taken into account, including the timely payment of data entry agents and the timely availability of data entry tools (tablets and connection credits) [21].

This shows that there is a disparity between the number of people vaccinated and the number of people entered in the DHIS2 software, which could explain the drop in vaccination coverage.

In France, on the other hand, all the people vaccinated were systematically entered in the COVID 19 Data Vaccine, a digital tool like DHIS2, which is available to all those involved in vaccination [22]. This provides a more or less accurate picture of vaccination coverage.

It should be noted that no MAPI data for these two vaccination campaigns were entered into the DHIS2 software. Nevertheless, we have described the MAPIs that were identified in the reports for these two campaigns.

Out of 11,228,30 people vaccinated during the second campaign, 627 mild cases of IPD were reported, i.e., 55.8 per 100,000, and only one serious case. During the first campaign, 269 cases of IPD, all of them minor, were reported out of 850,217 cases of vaccination, i.e., 31.6 per 100,000 [16].

A Canadian study on vaccine safety and side effects confirms our findings. After receiving a vaccine, it is normal to have side-effects, as the body's natural response is to work hard to build up immunity to the disease, and the more people are vaccinated, the more side-effects are reported [23].

Morgane Bomsel, Director of Research at the French National Centre for Scientific Research (CNRS), states that in the study of post-vaccination side-effects against COVID-19, most side-effects were neither serious nor long-lasting. As for serious events, they were rare. In the same study, she states that out of 59,165,000 injections carried out in France since the start of vaccination, 61,822 cases of mild adverse reactions have been reported, i.e., 1 per 1000 [24]. Most of the reported adverse events associated with COVID-19 vaccines were mild to moderate in intensity [20].

The number of cases during the second campaign can be explained by the increased awareness among vaccinators of

the need to report cases of IPD, the improved reporting of IPD during the second campaign, community awareness of IPD and the benefits of reporting it, and the improved free management of cases of IPD.

However, it has declined in the Kindia administrative region: this can be explained by the fact that waste managers and IBD cases were not dealt with during this phase.

Limitations of the study:

The limitations of our study included the following:

The failure to enter the IBDs notified during these two vaccination campaigns in the DHIS2 software prevented us from knowing which type of vaccine was most responsible for the IBDs and the most frequent symptoms.

Incomplete entry of the ages of vaccinated individuals in the DHIS2 software prevented us from analyzing the age variable in these two vaccination campaigns.

7. Conclusion

At the end of our study, we found that during the second campaign: Vaccination coverage improved, the number of MAPIs notified increased, more vaccine was available in terms of quality and quantity, and there was an improvement in data entry. We can deduce that the difficulties encountered during the first campaign were considered during the second. Our results will help the country to be better prepared for future campaigns.

Conflicts of Interest

There is no conflicts of interest.

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