

# Fight Against Covid-19 in Burkina Faso, Between Fear of the Disease and Reluctance to Vaccinate: Case of the University Hospital of Tengandogo

Research Article

Volume 3 Issue 2- 2022

## Author Details

Wedminere Noelie Zoungrana Yameogo<sup>1\*</sup>, Souleymane Kabore<sup>2</sup>, Issa Ouedraogo<sup>3</sup>, David Kangoye<sup>4</sup>, Yassia Bamogo<sup>5</sup>, Abdoulaye So<sup>6</sup>, Arielle Rita Belem<sup>7</sup>, Alban Michel Bassolé<sup>7</sup>, Désiré Dahourou<sup>8</sup>, Issa Diallo<sup>7</sup>, Lassina Serre<sup>7</sup>, Moussa Kabre<sup>7</sup>, Bernadin Ouedraogo<sup>5</sup>, Foro Corinne<sup>9</sup>, Flavien Kaboré<sup>10</sup>, Adama Sanou<sup>11</sup>, Idrissa Sanou<sup>9</sup>

<sup>1</sup>Department of Public Health, Tengandogo University Hospital, Burkina Faso

<sup>2</sup>Department of Public Health, Institut Supérieur des Sciences de la Santé or INSSA/ Université Nazi Boni, Bobo Dioulasso, Burkina Faso

<sup>3</sup>Direction de la prévention par la vaccination, Ministry of Health, Ouagadougou, Burkina Faso

<sup>4</sup>The Bizzell Group LLC, Burkina Faso

<sup>5</sup>Multipurpose Emergency Department, Tengandogo University Hospital, Ouagadougou, Burkina Faso

<sup>6</sup>Quality Department, Tengandogo University Hospital, Burkina Faso

<sup>7</sup>Medicine and medical specialties services, Tengandogo University Hospital, Ouagadougou, Burkina Faso

<sup>8</sup>Institute of Research in Health Sciences, Burkina Faso

<sup>9</sup>Department of Laboratory and Hospital Pharmacy, Tengandogo University Hospital, Burkina Faso

<sup>10</sup>Polyvalent Resuscitation Service, Tengandogo University Hospital, Burkina Faso

<sup>11</sup>Medical Services Department, Tengandogo University Hospital, Burkina Faso

## \*Corresponding author

Wedminere Noelie Zoungrana Yameogo, Department of Public Health, Tengandogo University Hospital, Burkina Faso

## Article History

Received: May 25, 2022 Accepted: May 25, 2022 Published: May 31, 2022

## Abstract

**Introduction:** According to WHO, on December 26, 2021, 278 million confirmed cases of Covid-19 were recorded worldwide with approximately 5.4 million deaths. In Burkina Faso, 17,632 cases with 318 deaths have been recorded. Vaccination is one of the strategies put in place to fight against this pandemic. The objective of the study was to assess the status of vaccination against Covid-19 among staff working in a hospital in Burkina Faso.

**Methods and materials:** We conducted a descriptive study from June 2, 2021 to December 31, 2021 at the Tengandogo University Hospital. The study involved all staff, regardless of their profile. The information was obtained by interview and a review of biological results. Quantitative variables were described using the mean and qualitative variables using the proportion.

**Results:** A total of 174 agents were vaccinated out of 636, i.e. a proportion of 27.35%, 95% CI [27-35]. The mean age was  $41 \pm 8$  years. Male gender 55%. Profiles represented were doctors and pharmacists 39%, nurses 36%, ward girls and boys 5.0%. The main reason for vaccination was personal convenience 43.1%. AstraZeneca vaccine was used in 63.22%, followed by Johnson and Johnson in 36%. Minor side effects were reported in 80% of vaccinees. No serious adverse events were reported. Three personnel vaccinated with Johnson and Johnson vaccine subsequently developed Covid-19 after 30 days, 66 days, 74 days respectively. One person vaccinated with AstraZeneca developed the disease 174 days after vaccination.

**Conclusion:** The proportion of those vaccinated was low. Given the dynamics of Covid-19, interventions to improve adherence among these front-line staff should be developed.

**Keywords:** Covid-19; Vaccination; Staff; Hospital; Burkina Faso

**Abbreviations:** WHO: World Health Organization; CI: Confidence interval

## Introduction

Coronaviruses are a large family of viruses that can cause a variety of illnesses in humans, ranging from the common cold to more se-



vere diseases. A new coronavirus (Sars-Cov-2) identified in December 2019 in Wuhan, China, is causing the Covid-19 pandemic [1,2]. According to WHO, on December 26, 2021, 278 million confirmed cases of Covid-19 have been recorded worldwide with approximately 5.4 million deaths [3]. Burkina Faso reported its first Covid-19 cases on March 09, 2020 [4]. As of January 2, 2022, Burkina Faso had recorded 18,637 cases, including 7,662 women and 1,063 men, with a total of 375 deaths, i.e. a proportion of 1.8% [5].

In order to fight against this pandemic, various preventive measures were used. The most important were physical distancing measures, the use of masks in public places and the closure of certain public places [6-8]. Vaccination was one of the prevention strategies that was developed. The first objectives of the SARS-CoV-2 vaccination campaign were to reduce mortality, severe forms of Covid-19 and strain on the health system. In addition, it helps to control the circulation of the virus and contain the epidemic due to the emergence of more transmissible variants [9]. As of February 18, 2021, at least seven (7) different vaccines have been made available to countries through three platforms while other vaccines are in clinical trials [10]. The efficacy of the Covid-19 vaccine varies from one vaccine to another and for some vaccines the efficacy varies according to the vaccination schedule as the more doses received the better the efficacy. For some vaccines the efficacy is better when the subject is young but it can be improved by several doses when the subject is old [11].

Burkina Faso has started its vaccination campaigns against Covid-19 from 02 June 2021. Initially AstraZeneca vaccine was used and later Johnson and Johnson. The University Hospital of Tengandogo began vaccinating its staff on June 8, 2021 in the form of a campaign. The campaigns started with AstraZeneca vaccine, then Johnson and Johnson, Sinopharm Chinese vaccine and Pfizer vaccine were used later [12]. As of October 20, 2021, 325,119 people had been vaccinated [13]. The objective of the present study was to assess the status of vaccination of staff at the Tengandogo University Hospital.

## Methods and Materials

### Type of Study and Study Period

This was a cross-sectional descriptive study that covered the period from June 2 to December 31, 2021.

**Study setting:** This study was conducted in Burkina Faso. Burkina Faso is a country located in West Africa. The latest population and housing census [RGPH, 2019] of Burkina Faso counted 20,487,979 inhabitants [14]. The study took place at the University Hospital Center of Tengandogo (CHUT), a third-level hospital according to the health pyramid of Burkina Faso. As of December 31, 2021, 636 agents of all profiles were working at CHUT, 61.1% of whom were female health professionals [15]. Among them were 123 doctors (19.4%), 251 nurses (39.4%), 36 midwives (5.6%), 91 ward staff (14.3%) and 10 pharmacists (1.6%). The remaining staff were administrative and technical support personnel. Vaccination against Covid-19 began on June 8, 2021 at CHUT as a vaccination campaign. From June to December 2021, 6 vaccination campaigns against Covid-19 were conducted at the Tengandogo University Hospital.

**Study population/sampling:** The study population consisted of all hospital staff, regardless of their profile. We proceeded with an exhaustive sampling of all agents who were vaccinated at CHUT.

**Data collection:** Information was collected from the agents by face-to-face or telephone interviews using a questionnaire. For the two-dose vaccine schedule, the study focused on the first dose. To avoid recall bias, interviews were conducted within two weeks of vaccination. However during the study period (June to December 2021) we intensified Covid-19 testing using polymerase reactive chain

reaction (PCR) among vaccinated staff by sending regular messages in the WhatsApp group where the telephone contacts of all hospital staff are located. PCR test results from staff were reviewed. We were able to obtain the information in relation to the occurrence of the disease between June and December 2021.

**Study variables:** The study variables were essentially the reasons for vaccination or non-vaccination (personal convenience, fear of disease, travel, mandatory vaccination), type of vaccine used (AstraZeneca, Johnson and Johnson, Pfizer), side effects experienced (Yes, No), time of onset of side effects (within 48h, after 48h), behavior of the entourage following the side effects experienced (none, refusal to be vaccinated, not applicable)

**Statistical analysis:** The data were processed and analyzed with STATA version 15 software. The mean and standard deviation were used to describe the quantitative variables. The proportion and 95% confidence interval was used to describe the qualitative variables

## Results

### Description of the Profile of Vaccinated Agents

A total of 174 health workers were vaccinated from June 2 to December 31, 2021, i.e. 27.36% of the total CHUT staff (n= 636) IC 95% [27-35]. The number of women vaccinated was 80 or 45.98% of those vaccinated. The main profiles vaccinated were doctors (36.0%), nurses (36.0%), ward girls and boys (5.0%), midwives (4.0%), pharmacists (3.0%) and others (16.7%). The mean age of the vaccinated patients was 41.25 years with a standard deviation  $\pm$  7.89. The proportion of subjects who agreed to be vaccinated was around 50% (62/123) for doctors and pharmacists (5/10). It was about a quarter among nurses, about a fifth among midwives and a tenth among GFS.

### Information on Vaccination

We collected some information related to vaccination, including the type of vaccine received, reasons for vaccination, side effects, and reaction of others.

This information is presented in Table 1.

### The Main Side Effects Recorded for All Vaccines

A total of 136 agents reported side effects after being vaccinated (78.16%). The majority of the agents (88.97%, n=121) experienced the side effects within 24 hours after vaccination, 10.13% people within one week after vaccination and one person within two weeks. The main side effects reported were body aches (51.15%), injection site pain (40.22%), headache (41.38%) and fever (39.08%). During the study period from June to December 2021, no serious adverse events were reported. No deaths from the vaccines were recorded. The adverse events are listed in Table 2.

The main side effects recorded with AstraZeneca vaccine were soreness recorded in 60% of the vaccinated persons, fever in 53.64% of the vaccinated persons and headache in 50.91% of the vaccinated persons, feeling unwell in 23.64% of the vaccinated persons. The side effects with Johnson and Johnson vaccine were pain at the injection site recorded in 36.51% of the vaccinated persons, feeling of uneasiness in 34.92% of the vaccinated persons, headache in 23.81% of the vaccinated persons and fever in 14.29% of the vaccinated persons.

Four people were diagnosed positive to Covid-19 with the PCR test performed at the laboratory of the University Hospital. Three of them were vaccinated with Johnson and Johnson vaccine. They developed Covid-19 respectively 30 days, 66 days, 74 days after vaccination. One person vaccinated with AstraZeneca vaccine tested positive 174 days after receiving the vaccine. In total, the proportion of health workers who developed the disease was 2.3%.



**Table 1:** Distribution of vaccinated subjects according to information on vaccination at CHUT in Burkina Faso in 2021.

Variables	Catégories	Vaccinated (n=174)	%
Reasons to get vaccinated	Personal Convenience	75	43,1
	Fear of disease	57	32,76
	Travel	23	32,76
	Feeling obliged	10	5,75
	Type of vaccines received		
	Astra-Zeneca	110	63,22
	Johnson and Johnson	63	36,21
	Pfizer	1	0,57
Experienced side effects	Yes	136	78,16
	No	38	21,84
Time to onset of side effects	Within 48 hours	134	98,53
	After 48 hours	2	1,14
Behavior of the entourage following the side effects felt	None	89	51,15
	Refusal of vaccination	38	21,84
	Not applicable	47	27,01

**Table 2:** Main side effects recorded by type of vaccine received at CHUT, Burkina Faso in 2021.

Variables	All Vaccines	N=173	%
	Modalités		
Curvatures	Yes	89	51,15
	No	85	48,85
Headaches	Yes	72	41,38
	No	102	58,62
Fever	Yes	68	39,08
	No	106	60,92
Pain at the injection site	Yes	70	40,22
	No	104	59,77
Feeling of being unwell	Yes	48	27,59
	No	126	72,41
Dizziness	Yes	14	8,05
	No	160	91,95
Vomiting	Yes	4	2,3
	No	170	97,7
Nauseas	Yes	9	5,17
	No	165	94,83
Epistaxis	Yes	1	0,57
	No	173	99,43



## Discussion

From June to November 2021, Burkina Faso authorities undertook vaccination campaigns to address the adverse effects of Covid-19. Four types of vaccine were introduced at CHUT: first the AstraZeneca vaccine, then the Johnson and Johnson vaccine, then the Sinopharm vaccine, and then the Pfizer vaccine. Out of a total of 636 agents, 174 were vaccinated, i.e., a proportion of 27.35%. Mistrust of the Covid-19 vaccines is clearly evident in the proportion of subjects who accepted the vaccination, which is close to 50% for doctors and pharmacists, about a quarter for nurses, a fifth for midwives and a tenth for ward boys and girls. In absolute terms, the largest numbers of vaccinated persons were recruited among doctors and nurses, with 36% in each group. Nurses, with 36% in each group or 72% of cases. The main side effects reported were aches and pains, headache, pain at the injection site and fever. Among the vaccinated agents, four (2.3%) developed Covid-19.

## Proportion of Subjects Vaccinated and Profiles

The proportion of vaccinated subjects in our study is above the national prevalence which was 10% [16]. However, it is well below the proportion of vaccinated subjects reported by Porru et al [17, 18] (82.5%) in a university hospital in Italy, as well as that described by Amit et al (45%) in Israel. It should be noted that the Covid-19 pandemic was much more severe in terms of prevalence and case fatality in Europe than in Africa, especially in Italy. Patient management capacities were often saturated [19, 20]. This has certainly contributed to encourage health care personnel to be vaccinated in order to avoid being contaminated by the disease.

The low proportion of staff vaccinated at the Tengandogo University Hospital reflects the reluctance of nearly 70% of health workers. This proportion of reluctance is higher than that found by Khamis and colleagues in a study conducted in Oman in the Middle East in 2021 [21]. Indeed, in our context, many prejudices have underpinned the Covid-19 epidemic in Burkina Faso, and even the pandemic worldwide. Many citizens thought that Covid-19 was a disease of rich people, or that, not knowing for what reason exactly, the black African subject was somehow immune to the disease [22-24]. But also, that it was a banal disease like any other viral pneumopathy (such as seasonal flu), in view of the very low prevalence and imputed mortality compared to what was announced on other continents, especially in Europe [25].

Although the proportions of unvaccinated personnel at CHUT remain above those found in many studies in the literature, the estimated proportion among nurses was well above that observed among physicians. The proportion of unvaccinated physicians was approximately 50% while that of nurses was 80%. When we compare these results with other studies, we find that these proportions are higher [18]. The proportion of health workers vaccinated was low. These workers are at the forefront of the response to Covid-19 in hospitals. The risk of infection is much higher, especially since they are in constant and sometimes prolonged contact with these patients.

Vaccination is one of the most effective disease control strategies with a proven track record. It has been successful in eradicating some serious diseases such as smallpox and in reducing the incidence, morbidity and mortality of other diseases such as measles, polio, meningitis and tuberculosis. To better control the incidence of an epidemic disease, when possible, vaccination is a mandatory strategy, especially if the lethality associated with that disease is high [26-29]. Vaccination against Covid-19 has been proposed as a strategy to fight the pandemic from which it originated, but this strategy has been variously accepted among the population, health professionals, researchers (public health, immunologists, bacteriologists, etc.) all over the world, especially in countries where the lethality of the disease has been low, less than 2%, as in Burkina Faso [13]. Several reasons could possibly explain this hesitation and loss of confidence, such as:

the delay in the manufacture of vaccines, the small number of studies evaluating the effectiveness of vaccines, the contradictory debates in the medical community on the benefits of vaccines, the low lethality of the disease, especially in countries with limited resources such as Burkina Faso, and the false and misleading information circulating on social networks in connection with vaccines.

## Side Effects

Side effects such as headache, injection site pain, and fever commonly experienced and described in several studies are normal and reflect a normal immune response [14]. Although the proportion of side effects in the present study is higher than that reported by Kaboré and collaborator during the introduction of the injectable polio vaccine in 2018 in Burkina Faso [30], the recorded effects remain less severe than those reported in northern countries. Indeed, contrary to other studies, no case of Guillain Barre syndrome was recorded with Johnson and Johnson. We make the same observation for thrombosis [31,32].

Three personnel vaccinated with Johnson and Johnson vaccine developed Covid-19 respectively after 30 days, 66 days, 74 days after receiving the vaccine doses. One person vaccinated with AstraZeneca after 174 days. The proportion of vaccinated health workers who developed Covid-19 (2.7%) is higher than that found by Amit et al (0.54%) in a study of health care workers in Israel who had been vaccinated with PFIZER vaccine [18]. It is also higher than that found by Porru et al (1.8%) in a study conducted in Italy [17]. Although it is true that we cannot exclude the efficacy of the vaccine, other factors can affect the quality of a vaccine, including the availability of cold chain materials, transportation, storage, and the vaccination site

## Conclusion

This study allowed us to assess the acceptance of Covid-19 vaccination in the hospital setting, to identify the reasons for vaccination, and to review the side effects induced by AstraZeneca and Johnson and Johnson vaccines. The proportion of healthcare workers who agreed to be vaccinated was low, for frontline workers involved in Covid-19 and other infectious diseases. Interventions to improve adherence among these frontline staff need to be developed as soon as possible.

## Ethical Considerations

Informed consent was required from hospital staff before inclusion in the study. The collection form was anonymous. All provisions were taken into account to maintain the confidentiality of patient data.

## Acknowledgements

We would like to thank Mr. Ferdinand Tiendrebeogo, Director General of the University Hospital of Tengandogo, for accepting permission to collect information from his agents.

## References

1. Van der Werf S, Peltekian C (2020) Émergence du coronavirus SARS-CoV-2: faire face à l'épidémie de Covid-19. *Virologie* 24(S1): S3-S6.
2. Amir I J, Lebar Z, Yahyaoui G, Mahmoud M (2020) Covid-19: virologie, épidémiologie et diagnostic biologique. *Option/Bio* 31(619): 15-20.
3. World health organization (WHO) West and Central Africa-Mise à jour de la situation épidémiologique de la COVID-19 en Afrique de l'Ouest et du Centre (AOC) au 07 février 2022.
4. Skrip L, Derra K, Kaboré M, Noori N, Gansané A, et al. (2020) Clinical management and mortality among COVID-19 cases in sub-Saharan Africa: A retrospective study from Burkina Faso and simulated case analysis. *International Journal of Infectious Diseases* 101: 194-200.
5. Fonds des nations unies pour la population (UNFPA) (2021) Burkina Faso. Rapport de situation humanitaire, octobre à décembre.



6. Burkina Faso (2020) Premier Ministère Décret N°2020-0271-PM-MDNAC-MTDC-MSECU-MS-MTMUSR. portant restriction temporaires de liberté au titre des mesures spéciales de réduction de la propagation du COVID19.
7. Burkina Faso (2020) Ministère des transports, de la mobilité publique et de la sécurité routière. Arrêté interministériel N°2020-11 7 IMS/MDNAC/MATDC/MSECU/MTMUSR portant fixation de conditions de sortie et d'entrée dans les villes mises en quarantaine.
8. Burkina Faso (2020) Ministère des transports, de la mobilité publique et de la sécurité routière. Arrêté interministériel N°2020-11 7 IMS/MDNAC/MATDC/MSECU/MTMUSR portant fixation de conditions de sortie et d'entrée dans les villes mises en quarantaine.
9. Peiffer-Smadja N, Rozencwajg S, Kherabi Y, Yazdanpanah Y, Montravers P (2021) Vaccins COVID-19: une course contre la montre [COVID-19 vaccines: A race against time]. *Anesthésie & Réanimation* 7(3): 199-202.
10. Thanh Le T, Andreadakis Z, Kumar A, Gómez Román R, Tollefsen S, et al. (2020) The COVID-19 vaccine development landscape. *Nat Rev Drug Discov* 19(15): 305-306.
11. Du Québec C S L I (2021) Données préliminaires sur l'efficacité vaccinale et avis complémentaire sur la stratégie de vaccination contre la COVID-19 au Québec en contexte de pénurie.
12. Burkina Faso (2021) Ministère de la santé Institut national de sante publique. Centre des opérations de réponse aux urgences sanitaires. Rapport de situation de la vaccination contre la COVID-19 au Burkina Faso.
13. Burkina Faso (2021) Ministère de la santé. Institut national de sante publique. Centre des opérations de réponse aux urgences sanitaires. Rapport de situation de la vaccination contre la COVID-19 au Burkina Faso.
14. Burkina Faso (2020) Institut National de la Statistique et de la Démographie (INSD). Résultats préliminaires du 5ème Recensement Général de la Population et de l'Habitat (RGPH).
15. Burkina Faso (2021) Centre hospitalier universitaire Tengandogo. Annuaire statistique.
16. Burkina Faso (2021) Covidvaxlive. Suivi de la situation de la vaccination contre la Covid19.
17. Porru S, Spiteri G, Monaco MGL, Valotti A, Carta A, et al. (2022) Post-Vaccination SARS-CoV-2 Infections among Health Workers at the University Hospital of Verona, Italy: A Retrospective Cohort Survey. *Vaccines* 10(2): 272.
18. Amit S, Beni SA, Biber A, Grinberg A, Leshem E, et al. (2021) Postvaccination COVID-19 among Healthcare Workers, Israel. *Emerg Infect Dis* 27(4): 1220-1222.
19. Eboko Fred, Schlimmer Sina (2020) COVID-19: l'Afrique face à une crise mondiale. *Politique étrangère* pp. 123-134.
20. Hardy É J, Flori P (2021) Spécificités épidémiologiques de la COVID-19 en Afrique: préoccupation de santé publique actuelle ou future? In *Annales Pharmaceutiques Françaises* 79(2): 216-226.
21. Khamis F, Badahdah A, Al Mahyijari N, Al Lawati F, Al Noamani J, et al. (2022) Attitudes Towards COVID-19 Vaccine: A Survey of Health Care Workers in Oman. *J Epidemiol Glob Health* 12(1): 1-6.
22. Hien H (2020) La résilience des systèmes de santé: enjeux de la COVID-19 en Afrique subsaharienne. *Santé Publique* 32(2): 145-147.
23. Migliani R (2021) La pandémie de Covid-19, spécificités en Afrique. *Herodote* 183(4): 85-97.
24. Vidal L, Eboko F, Williamson D (2020) Le catastrophisme annoncé, reflet de notre vision de l'Afrique. *Le Monde Afrique* 9.
25. Heikel J (2021) Pandémie à coronavirus Covid-19: l'exception africaine? *Revue française de socio-Economie* pp. 165-171.
26. Reinert P, Soubeyrand B, Gauchoux R (2003) Évaluation de 35 années de vaccination rougeole-oreillons-rubéole en France. *Archives de pédiatrie* 10(11): 948-954.
27. Cutts FT, Dabis F (1994) Contrôle de la rougeole dans les pays en développement. *Cahiers d'études et de recherches francophones/Santé* 4(3): 163-171.
28. Sarlangue J (2022) Histoire des vaccinations, de la variole à la Covid-19. *Perfectionnement en Pédiatrie* 1-12.
29. Koné N, Bougoudogo F (2011) Evaluation de l'efficacité des JNV organisées dans le District de Bamako dans le cadre de l'accélération de l'éradication de la poliomyélite 1997-2009.
30. Kaboré S, Bérenger Y L, Kaboré, Saïde Yacine YA, Ouédraogo, et al. (2020) collaborateurs. Introduction of inactivated polio vaccine in the Center East region of Burkina Faso in 2018: lessons learned. *International Invention of Scientific Journal* 4(4).
31. Carranza O, Babici D, Waheed S, Yousuf F (2022) Neurologic Sequela of COVID-19: Guillain-Barré Syndrome Following Johnson & Johnson COVID-19 Vaccination. *Cureus* 14(4): e24252.
32. Márquez Loza AM, Holroyd KB, Johnson SA, Pilgrim DM, Amato AA (2021) Guillain-Barré syndrome in the placebo and active arms of a COVID-19 vaccine clinical trial: temporal associations do not imply causality. *Neurology* 96(22): 1052-1054.

