



Knowledge and Practices of Indigenous Populations on COVID-19 in the Republic of Congo: Case of the Sangha Department, 2021

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Abstract

Introduction: COVID-19, which originated in China, has changed the global epidemiological landscape by increasing morbidity and mortality. The difficulties of indigenous populations in coping with this pandemic are evident. This study aimed to assess the knowledge and practices of the indigenous populations of the Sangha on COVID-19.

Methodology: This is a community-based analytical CAP study that took place from May 10th to August 10th, 2021 among the indigenous people of the Sangha Department in the Republic of Congo. A two-stage cluster survey was conducted and the SCHWARTZ formula was used to obtain a sample of 427 subjects. Data were entered and processed in Excel 2020 and analyzed using Epi-Info version 7.2.6 software. To assess knowledge and practices on COVID-19, a point score was assigned to the different responses: 0 to 4= Very negative, 5 to 8= Negative, 9 to 12= Positive, 13 to 16= Very positive. The odds ratios and their 95% Confidence Intervals (CI) were used to quantify the strength of the relationship. The test was significant if the p-value was less than 0.05.

Results: The mean age of the respondents was 35.1 ± 13.92 years. The sex ratio of men to women was 1.16. The predominant level of knowledge was very negative (37.5%). The level of majority practices was negative (38%). Finally, only the level of knowledge was significantly associated with prevention practices [OR=7.5; CI 95% = (4.5-12.3), P<0.05].

Conclusion: This study shows that the level of knowledge was associated with prevention practices, but was overall low among indigenous peoples. It shows that these populations can take ownership of prevention measures and actively participate in the fight against coronavirus.

Keywords: COVID-19; Knowledge and practices; Indigenous; Sangha, Congo

Introduction

COVID-19, which came from China in late 2019, has worsened the global epidemiological landscape by causing millions of cases and thousands of deaths worldwide. Faced with the rapid spread and increase in cases worldwide, the WHO has declared this disease as a pandemic and therefore, a major public health problem worldwide [1]. This worsens the precarious situation in which most indigenous peoples were already living. The United Nations system and governments must continue to make efforts to better protect these peoples.

The vulnerability of these populations to communicable diseases had already been highlighted during the influenza A (H1N1) pandemic in 2009. The mortality of this flu was 3 to 6 times higher than that of non-indigenous populations in the Americas [2]. This reflects the potential difficulties that these populations may have in controlling COVID-19.

The coronavirus is new, and the search for solutions to this disease remains a long time coming. Prevention and control efforts for COVID-19 currently rely on public health measures such as vaccination, physical distancing, mask wearing, and frequent hand washing with soap and water, and use of antiseptic solutions. The lack of resources makes it difficult for populations in precarious socio-economic situations, in which most indigenous people live. Compliance with prevention measures is difficult to implement in indigenous communities [3].

The situation of indigenous populations in the Republic of Congo is generally similar to what is observed elsewhere. Thus, in the face of the epidemiological threat of COVID-19, this work has

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set itself the objective of studying the knowledge and practices of indigenous people on COVID-19, in order to inform the choices on specific prevention measures aimed at reducing inequalities in the fight against this pandemic.

Methodology

Type and period of study

This is a cross-sectional, community-based, analytical CAP study that took place from May 10th to August 10th, 2021, i.e. duration of 3 months.

Study frame work

The study took place in the Sangha Department, specifically in Ouesso and Mokeko, in the households of indigenous populations (Figure 1).

This is one of the three departments of the Republic of Congo where indigenous populations are concentrated. It borders Cameroon and Gabon to the north and southwest respectively. To the east and south, it is separated by the other Congolese departments of Likouala and Cuvette Ouest.

Study population

Target population: The target population of our study is the indigenous populations residing in Ouesso and Mokeko.

Selection criteria: a) Inclusion: Participants who had been living in Ouesso or Mokeko for at least 6 months and who agreed to participate in the study were included in our study.

b) Non-inclusion: The study did not include all those who were absent when the interviewer visited and those whose physical or mental state did not allow them to respond to the study.

Selection of households: In each concession, the interviewer first identified the households. The households were numbered on a list and one was drawn at random.

Selection of individuals: Within each household, numbers were assigned to individuals who met the inclusion criteria. A number was drawn at random and the corresponding person was surveyed.

Sampling

Type of sampling: A two-stage cluster survey was conducted. The department of Sangha was chosen because it is one of the geographic areas with the most indigenous people in the Republic of Congo after Lekoumou and Likouala. Among the two (02) large localities of the Sangha (Ouesso and Sembe), we selected Ouesso by random draw. In Ouesso, which has six (06) neighborhoods or geographic areas considered as clusters, we selected two (02) at random, including the neighborhoods of Ouesso (which bears the same name as the city) and Mokeko. Within these clusters, we included all eligible individuals for this study. In the end, we used exhaustiveness to constitute our sample whose minimum size is estimated below.

Sample size: We calculated our sample size to determine the minimum to be achieved using Daniel SCHWARTZ's formula:

$$N \geq Z^2 \alpha / 2 \times p \times (1-p) / d^2$$

- N: Minimum sample size.
- $Z\alpha/2$: Confidence level (the standard value of the 95% confidence level will be 1.96)
- p : Proportion of indigenous people's knowledge of

COVID-19 in Ouesso or Mokéko; it is 50% (because we do not have the proportion).

- d: Margin of error of 5% (0.05).

We had $N \geq 386$ individuals, which mean that our minimum sample size is 386 natives.

During the course of our survey, we reached a sample size of 427, which we considered our final sample size.

Data collection tools and procedure

We used an anonymous questionnaire embedded in the Kobo application for data collection. Structured individual interviews were conducted with the respondents.

Data entry and data analysis

Data were entered and processed on Excel 2020 and then analyzed using Epi-Info version 7.2.6 software. For qualitative variables, frequencies were calculated with their 95% confidence intervals. A comparison of proportions was made using Pearson's Chi-square test or Fisher's test, depending on their applicability. The calculation of means with their standard deviation was performed for quantitative variables. To evaluate the knowledge and practices on COVID-19, a point score was assigned to the different answers: 0 to 4= Very negative, 5 to 8= Negative, 9 to 12= Positive, 13 to 16= Very positive.

Limitations of the study

The inequalities faced by indigenous populations, all else being equal, their entrenched way of life, and the difficulties of age accuracy (as many do not have civil status documents and do not recognize their birth years) guided the quantitative nature of this study. Instead of a complementary socio-anthropological approach to better understand the opinions and perceptions of indigenous populations on COVID-19, which could have allowed for a better understanding of their behaviors towards this pandemic. The use of non-indigenous interviewers in the administration of the questionnaire tended to increase the risk and effect of social desirability, especially since they appeared as face-to-face assessors. A telephone or online survey could have avoided this bias. Despite these limitations, the methods used allowed us to highlight an assessment of the knowledge, attitudes and practices of the indigenous people on the pandemic in COVID-19.

Results

Socio-demographic characteristics

The average age of the persons surveyed was 35.1 ± 13.92 years and the extremes were 15 and 80 years. The median age was 32 years. The most represented age group was 18 to 39 years. Men represented more than half of the respondents, 53.9%, with a sex ratio of 1.16. People living in couples represented 66.74% of the surveyed population. More than half of the people surveyed (70.26%) had no education. The unemployed predominated, representing 53.16% of the study population, while the others had precarious jobs in survival agriculture (38.87%) or in small businesses (7.97%) (Table 1).

Indigenous peoples' knowledge's of COVID-19

A total of 71.4% of the respondents said they defined COVID-19 as a disease, 17.80% did not know how to define it, and 10.77% said it was a curse.

53.62% of autochthones attributed the causes of COVID-19 to microbes. 33.95% did not know what it was, and 12.43% said it was caused by a Bad Spell. Regarding the mode of transmission, 54.80%

Table 1: Socio-demographic characteristics of the indigenous of Ouesso and Mokeko, 2021.

| Socio Demographic Characteristics | Indigenous (N=427) | |
|-----------------------------------|--------------------|-------|
| | n | % |
| Average age (SD) | 35.1 (13.92) | |
| Median age (Q1; Q3) | 32 (24; 42) | |
| Age (min; max) | 15; 80 | |
| Age Class | | |
| 18-39 | 306 | 71.6 |
| 40-80 | 121 | 28.4 |
| Sex | | |
| Men | 230 | 53.9 |
| Female | 197 | 46.1 |
| Level of Study | | |
| None | 300 | 70.26 |
| Primary | 127 | 29.74 |
| Marital Status | | |
| In couple | 285 | 66.74 |
| Lives alone | 142 | 33.26 |
| Socio-Professional Status | | |
| Unemployed | 227 | 53.16 |
| Food agriculture | 166 | 38.87 |
| Small business | 34 | 7.97 |



Figure 1: Study frame work.

of the participants stated that the mode of transmission was contact, 35.36% attributed it to witchcraft, and 9.84% offered no answer (Table 2).

Nearly 40.98% of natives reported knowledge of only one sign of the disease. Knowledge of two, three and four signs of COVID-19 was reported by 17.10, 21.54 and 11.01 respectively. Most natives had an insufficient level of knowledge and only 4.2% had a "Very good" level of knowledge (Table 3).

The majority of respondents used the following sources of information: Radio (75.9%), television (30.42%), the street (29.5%), sensitization by community outreach workers (18.9%) and health centers (7.3%) (Figure 2).

Practice of preventive measures against COVID-19

The most commonly reported methods of protection were hand washing (77.8%), which was most often done with soap and water

Table 2: Indigenous peoples' knowledge's of COVID-19 people surveyed.

| Knowledge's | People surveyed (N=427) | |
|-------------------------------|-------------------------|-------|
| | n | % |
| Definition of COVID-19 | | |
| Disease | 305 | 71.43 |
| Don't know | 76 | 17.80 |
| Bad luck | 46 | 10.77 |
| Causes of COVID-19 | | |
| Microbe | 229 | 53.62 |
| Don't know | 145 | 33.95 |
| Bad luck | 53 | 12.43 |
| Mode of Transmission | | |
| Contact | 234 | 54.80 |
| witchcraft | 151 | 35.36 |
| Don't know | 42 | 9.84 |
| Signs of the COVID-19 | | |
| 1 sign | 175 | 40.98 |
| 2 signs | 73 | 17.10 |
| 3 signs | 92 | 21.54 |
| More than 4 signs | 47 | 11.01 |
| Don't know | 40 | 9.37 |

Table 3: Level of knowledge of the COVID-19.

| Level of Knowledge | Points | Persons % |
|--------------------|--------|-----------|
| Very negative | 0-4 | 37.5 |
| Negative | 5-8 | 32.1 |
| Positive | 9-12 | 26.2 |
| Very positive | 13-16 | 4.2 |

(59.5%), followed by wearing a mask (67.9%) and physical distancing (14.4%).

In this survey, participants could report several methods of protection that they use.

The practice of prevention of respiratory contamination risks showed that 50.5% of respondents reported coughing or sneezing into the crook of their elbow. Among the 86.2% of the natives who mentioned wearing a mask, 78.3% put it on when going out (Table 4).

It appears that 49.6% have good practices and 50.4% have bad practices (Table 5).

Socio-demographic characteristics and knowledge levels about COVID-19

People aged 18 to 39 had a better knowledge level (74.6%) than others (25.4%). Similarly, men had better knowledge (50.8%) than women (49.2%). The "literate" level of education, the Mbindjo and Mokeko health areas, and employment were significantly associated with "satisfactory" level of knowledge (P<0.05) on the COVID-19. (Table 6).

Factors associated with the prevention of COVID-19

It was found that only people with a satisfactory level of knowledge were more likely to apply the preventive measures against COVID-19 [OR=7.5; CI 95% = (4.5-12.3), P<0.05] (Table 7).

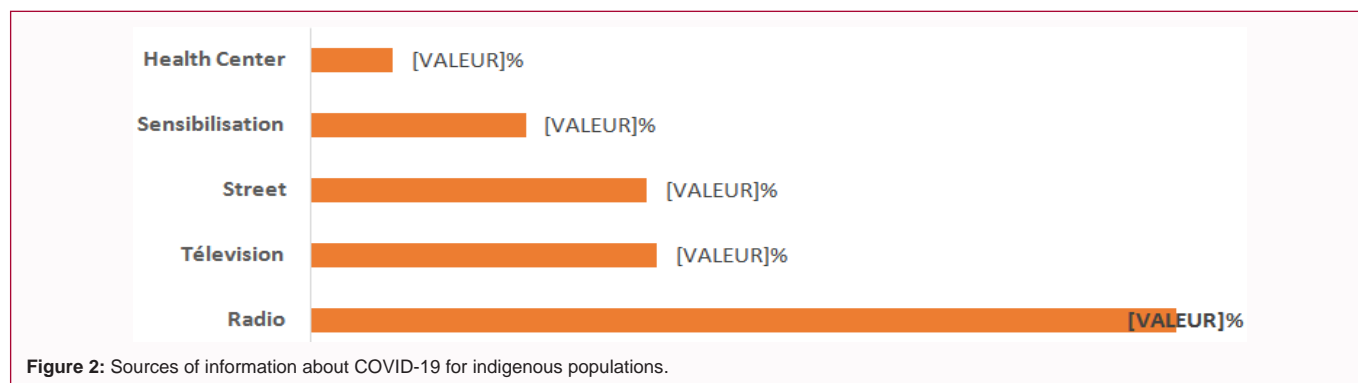


Table 4: COVID-19 prevention practices.

| Practices | Persons surveyed (N=427) | |
|--------------------------------------------------|--------------------------|------|
| | n | % |
| Protection Method | | |
| Hand washing | 330 | 77.8 |
| Port du masque | 288 | 67.9 |
| Physical distance | 61 | 14.4 |
| Hand Washing | | |
| Yes | 256 | 60.0 |
| No | 171 | 40.0 |
| Hand Washing Method | | |
| Water and soap | 254 | 59.5 |
| Hydro alcoholic gel | 173 | 40.5 |
| Cough/Sneeze into the Crook of your Elbow | | |
| Yes | 215 | 50.5 |
| No | 212 | 49.5 |
| Wearing a Protective Mask | | |
| Yes | 368 | 86.2 |
| No | 59 | 13.8 |
| Moment of Wearing the mask | | |
| Exit | 334 | 78.3 |
| Talk | 85 | 20.0 |
| Never | 8 | 1.7 |

Table 5: Level of COVID-19 prevention practices.

| Levels of practices | Points | % |
|---------------------|--------|----|
| Very negative | 0-4 | 31 |
| Negative | 5-8 | 38 |
| Positive | 9-12 | 26 |
| Very positive | 13-16 | 5 |

Discussion

The objective of this study was to assess the knowledge and practices of the indigenous populations of Congo on COVID-19.

Socio-demographic characteristics

This study shows that the most represented age group was 18 to 39 (71.6%). It should be noted that the ages of indigenous people in the Republic of Congo are often difficult to know precisely, especially when births occur outside of public health facilities. However, these

Table 6: Socio-demographic characteristics and knowledge about COVID-19.

| Variables | Level of knowledge | | | | OR (CI 95%) | p |
|----------------------------|--------------------|-------|-------------|-------|---------------|----------|
| | Satisfied | | Unsatisfied | | | |
| | N | % | N | % | | |
| Age Class | | | | | | |
| 18-39 | 97 | 74.6 | 212 | 71.4 | 1.2 (0.7-1.9) | |
| 40-80 | 33 | 25.4 | 85 | 28.6 | 1 | 0.49153 |
| Sex | | | | | | |
| Men | 66 | 50.8 | 164 | 55.2 | 0.8 (0.6-1.3) | |
| Female | 64 | 49.2 | 133 | 44.8 | 1 | 0.39601 |
| Study Level | | | | | | |
| Primary | 44 | 36.7 | 83 | 21 | 1.6 (1.0-2.4) | |
| None | 76 | 63.3 | 224 | 73 | 1 | 0.010711 |
| Marital Status | | | | | | |
| In couple | 98 | 63.63 | 101 | 37 | 0.7 (0.4-1.1) | 0.1513 |
| Alone | 56 | 36.37 | 172 | 63 | 0.8 (0.4-1.9) | 0.6679 |
| Aires de Sante | | | | | | |
| Mbindjo | 52 | 40 | 60 | 20.2 | 4.1 (2.3-7.0) | 0.0000 |
| Mokeko | 50 | 38.5 | 106 | 35.7 | 2.2 (1.3-3.8) | 0.0033 |
| Nzalangoye | 28 | 21.5 | 131 | 44.1 | 1 | 0.00000 |
| Professional Status | | | | | | |
| Employment | 88 | 53.66 | 112 | 42.59 | 2.9 (1.9-4.7) | |
| Unemployment | 76 | 46.34 | 151 | 57.41 | 1 | 0.00000 |

Table 7: Factors associated with the prevention of COVID-19.

| Variables | Prevention of COVID-19 | | | | OR (IC 95%) | p |
|---------------------------|------------------------|------|-----|------|-----------------|---------|
| | Yes | | No | | | |
| | N= | % | N= | % | | |
| Level of Knowledge | | | | | | |
| Satisfied | 105 | 80.8 | 25 | 11.6 | 7.5 (4.5 -12.3) | |
| Not satisfied | 107 | 36.0 | 190 | 64.0 | 1 | 0.00000 |

ages reflect the youthfulness of the general population in Congo. Most participants were male (53.9%) with a sex ratio of 1.16. Men, who often hide behind women in this community, were more accessible to interviews. These results corroborate the male predominance previously observed in a national survey on COVID-19 in Congo [4]. In contrast, the opposite results were found among students at the Institut Supérieur des Techniques Médicales in Lubumbashi, DRC [5] and among non-indigenous populations in Cameroon on

COVID-19 [6].

Our study shows that most of the respondents had no level of education (70.26%). This finding reflects the difficulties of integration into the education system experienced by the indigenous peoples of Congo. While most Congolese populations have a level of education between secondary school and higher education (38.5%) [4]. These results are in line, albeit to a lesser extent, with those obtained in the departments of Mayo-Sava and Mayo-Tsanaga, in the far north of Cameroon, where 75.1% of the people had no education at all [6]. Access to education, which is often not free in Congo as in Africa, is not adapted to the indigenous populations, who should benefit from subsidies to reduce these serious inequalities. This social divide is also evident in terms of socio-professional status, where practically all the respondents were in precarious situations, as 53.16% were unemployed, and 38.87% and 7.97% lived from agricultural activities and small-scale trade, respectively. This socio-economic vulnerability is not specific to the indigenous people in our study, as it has also been highlighted in Canada [7]. Living in a couple was 66.74% and living alone 33.26%. The financial constraints that condition the formalization of unions through marriage explained our choice not to privilege the marital situation.

Knowledge of indigenous populations on COVID-19

Since the arrival of this new pandemic, knowledge about this disease has been progressively developing according to the evolution of scientific research.

In our study, 71.43% of the indigenous people knew about COVID-19 as a disease; 17.80% were unaware of this disease and 10.77% defined it as a bad spell. Positive and very positive levels of knowledge were only 26.2% and 4.2% respectively. The diversity and low frequencies of knowledge levels about COVID-19 reveal the importance of tailoring prevention messages to these communities. The results of our study are lower than those found in the general population where 96.8% of people knew that coronavirus is a disease [4], and in DRC or even Cameroon where 99.6% (5) and 98% (6) respectively recognized COVID-19 as a disease.

The erroneous answers observed such as bad luck (12.43%) or ignorance of COVID-19 (33.95%), explain the difficulties that the participants in this study had in knowing the modes of transmission and the causes of this disease, which is nevertheless one of the most mediatized health problems in a short time in the history of public health. For in the period of high transmissibility of SARS-CoV-2, contact (54.80%), witchcraft (35.36%), and ignorance (9.84%) were respectively declared as modes of transmission of COVID-19 by the natives. These results have contrary trends to those observed in the general population in the Republic of Congo where only 10.4% of individuals were unaware of the modes of COVID-19 contamination [4].

The analysis of the knowledge of the signs of the coronavirus reveals a major deficit of information on this disease, because most of the people declared to know only one sign (40.98%). The weight of the accumulation of vulnerabilities could explain this situation of knowledge which is lower than that reported in the general population where 62.8% of the inhabitants of the national territory of Congo, knew at least three signs evocative of COVID-19 among which fever and cough [4].

The disparities observed with our results could probably be explained by the poor access of the natives to scientific information

sources. Radio (75.9%) and television (30.4%), being the most followed, had not improved the levels of knowledge about COVID-19. Thus, it seems necessary to strengthen awareness among this at-risk population to improve their level of knowledge so that they have responsible attitudes and practices in the face of the COVID-19 pandemic. The Ministry of Health and Population should therefore strengthen awareness efforts in appropriate languages through channels accessible to indigenous populations. This is to counteract the under-information and misinformation that limit public health actions in the fight against this pandemic [8].

Our study shows that respondents with a satisfactory level of knowledge had a higher probability of applying preventive measures against COVID-19 [OR=7.5; CI 95% = (4.5-12.3), P<0.05]. Several studies on coronavirus have also demonstrated this correlation, such as a study of 3037 publications on sub-Saharan Africa where all the research showed positive effects of knowledge on prevention of COVID-19. This association is also reported by Leye M. and Bao-Liang Z. respectively in Senegal in the city of Dakar and in China [9,10].

Prevention practices for COVID-19

In order to deal with SARS-CoV-2, awareness must be based on strict compliance with protective measures for all segments of the population, especially the most disadvantaged, including the indigenous population. In terms of practices, the study revealed that 77.8% of respondents practiced hand washing, 67.9% wore masks and 14.4% used physical distancing. The concomitant use of these practices is necessary to avoid contaminating and being contaminated by COVID-19. These results reflect the ability of indigenous peoples to take ownership of prevention measures and thus actively participate in the fight against the coronavirus. The effects of past experiences with Ebola awareness in our study areas, where these groups were targets of communication due to their proximity to forests as well as their dietary lifestyle favoring bush meat, could explain this.

In addition, some indigenous prevention practices in this study were more satisfactory than those observed in other studies. For example, among religious and traditional healers in Gondar (northwestern Ethiopia), only 65.5% had correctly practiced hand washing and 17.8% had correctly used face masks [11]. The recent realization of our study in a context of intensified communication on mandatory vaccination and compliance with barrier measures through the media in Congo, could explain this difference.

Also, compared to the results obtained for the general population, the use of masks was more common among the indigenous population (77.8%) than among the "Bantu", also called non-indigenous (76%). The free distribution of masks to indigenous people could explain this difference. On the other hand, among the Bantus, hand washing (78%) and the practice of social distancing (67.1%) were more frequent [4]. Studies conducted in Dakar showed more satisfactory results with higher frequencies of mask wearing (93.8%) and hand washing with soap and water (77.8%) [3].

The gesture of coughing into the crook of the elbow to reduce the risk of spreading SARS-CoV-2 was cited by 50.5% of Aboriginal people. This is one of the respiratory hygiene practices considered as a basic measure to be applied by all and at all times, in the absence of a handkerchief [12]. Targeted information, education and communication actions on anti-COVID-19 hygiene measures, as well as the continuation of the distribution of individual prevention

consumables among indigenous peoples, deserve to be implemented.

In general, the anti-COVID-19 prevention practices among indigenous people need to be improved, as the predominant levels of practice were "very negative" (31%) and "negative" (38%) respectively. In spite of this, the statements show that 49.6% had good practices. It therefore seems appropriate to involve indigenous communities directly in the prevention of COVID through community actions.

Conclusion

This study shows that the level of knowledge was associated with prevention practices, but it was globally low among indigenous peoples. However, it shows that these populations can take ownership of prevention measures and actively participate in the fight against coronavirus. Recognition of the risks and vulnerabilities of these peoples would facilitate their participation in targeted responses to the pandemic. Community sensitization strategies on good prevention practices and free distribution of means of control must be intensified in order not to aggravate the vulnerability of these populations, but rather to make them real actors in the fight against COVID-19.

References

- Hager E, Odetokun IA, Bolarinwa O, Zainab A, Okechukwu O, Al-Mustapha AI. Knowledge, attitude, and perceptions towards the 2019 Coronavirus pandemic: A bi-national survey in Africa. *PLOS ONE*. 2020;15(7):0236918.
- La Ruche G, Tarantola A, Barboza P, Vaillant L, Gueguen J, Gastellu-Etchegorry M, et al. The 2009 pandemic H1N1 influenza and indigenous populations of the Americas and the Pacific. *Euro Surveill*. 2009;14(42):19366.
- World Health Organization. Coronavirus Disease (COVID-19) technical guidance: Infection prevention and control/WASH. 2020.
- UNICEF Congo. Étude sur les connaissances, perceptions, attitudes et pratiques des populations face à la COVID-19 en République du Congo. 2020.
- Ngoyi JM, Kabamba LN, Tambwe PN, Mutombo JT, Katanga LM, Muganza RB, et al. Connaissances, attitudes et pratiques liées au SRAS-COV-2 (COVID-19) chez les étudiants de l'Institut Supérieur des Techniques Médicales de Lubumbashi. 2020.
- Essouga J, Pendjo A, Tchamba M, Skjonsberg M. Enquête CAP (Connaissances, attitudes et pratiques) sur le Coronavirus (COVID-19) dans les départements du Mayo-Sava et du Mayo-Tsanaga Région de l'Extrême-Nord Cameroun. *Croix-Rouge Camerounaise*; 2020.
- Mosby I, Swidrovich J. L'expérimentation médicale et les causes de la réticence à la vaccination contre la COVID-19 chez les peuples autochtones du Canada. *CMAJ*. 2021;193(23):E892-4.
- World Health Organization. Infodemic management: A key component of the COVID-19 global response. *Weekly Epidemiological Record*. 2020;95(16):145-8.
- Leye MMM, Keita IM, Bassoum O. Knowledge, attitudes and practices of the population of Dakar region on the COVID-19. *Sante Publique*. 2020;32(5):549-61.
- Zhong BL, Luo W, Li HM, Zhang QQ, Liu XG, Li WT, et al. Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: A quick online cross-sectional survey. *Int J Biol Sci*. 2020;16(10):1745-52.
- Asmelash D, Fasil A, Tegegne Y, Akalu TY, Ferede HA, Aynalem GL. Knowledge, attitudes and practices toward prevention and early detection of COVID-19 and associated factors among religious clerics and traditional healers in Gondar Town, Northwest Ethiopia: A community-based study. *Risk Manag Healthc Policy*. 2020;13:2239-50.
- INSPQ. COVID-19 : Mesures sanitaires recommandées pour la population générale. 2020.