

Article

## Coronavirus-19 in the Democratic Republic of Congo: Public views, attitudes, and beliefs in an unaffected area: the case of the city of Mbuji-Mayi

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### Abstract:

**Background:** The coronavirus disease (COVID-19) pandemic is rapidly spreading across the world. In Democratic Republic of Congo (DRC), 11 out of 26 provinces have been affected on 19 June 2020. The purpose of this study was to assess the public views, attitudes and beliefs related to the COVID-19 pandemic among the population of an unaffected city.

**Methods:** This is a descriptive observational study conducted in an unaffected city using a questionnaire.

**Findings:** A total of 769 people participated. The average age was 36 ±14 years. The sex ratio (male: female) was 1.6. The majority of respondents (97%) is aware of the existence of the COVID-19 pandemic, it is well informed about the signs of the disease, its severity and barrier measures, however few of them have adopted the change in habit and behavior in respect of the barrier measures. Lack of water for handwashing is the most common difficulty in complying with barrier measures (71%). The COVID-19 is considered as an artificial virus designed to reduce the world population by 26%, God's punishment (22%). Only 36% of the participants are in favor of vaccination against COVID-19. Vaccine is, a western conspiracy to spread COVID-19 in Africa (38%), testing it on Africans (35%), sterilize Africans' people (12%).

**Conclusions:** Cities not yet affected by COVID-19 in DRC are aware of the existence of the disease, but insufficiently prepared to deal with it. It is important to increase awareness on barrier measures, combating false information, and improving regular water supply for regular handwashing.

**Keywords:** COVID-19. Public views. Attitudes. Beliefs. Unaffected area. Democratic Republic of Congo.

## 1 Introduction

Coronavirus disease 2019 (abbreviated "COVID-19") is an emerging respiratory disease that is caused by a novel coronavirus called coronavirus SARS-CoV-2 and was first detected in December 2019 in Wuhan, China. The disease is highly infectious, and its main clinical symptoms include fever, dry cough, fatigue, myalgia, and dyspnea [1]. By the end of January 2020, the World Health Organization (WHO) reported a total of 7818 confirmed cases worldwide and declared the outbreak a public health emergency of international concern. Given the alarming level of spread and severity of the disease, this is how on 11 March 2020 according to the WHO, the COVID-19 epidemic is becoming a pandemic and calls for essential protection measures against the new coronavirus against the saturation of hospital places in intensive care and the strengthening of preventive hygiene (suppression of physical contact, kissing and shaking hands, end of gatherings and large demonstrations as well as non-essential travel, promotion of handwashing, implementation of quarantine etc.) [2]. In total, about 200 countries and territories are affected by this global health crisis, with outbreaks of more than 50,000 confirmed cases in countries in Asia, Europe, the United States and Oceania. In Africa, the first case of COVID-19 was confirmed on 14 February 2020 in Egypt [3]. In Sub-Saharan Africa, the first case was reported in Nigeria on the 27th of February [4,5]. Most cases confirmed in Africa during the first week were imported from either Asia or Europe. Local transmission followed late resulting in a rapid increase in cases. The WHO has warned that potentially 190,000 deaths could occur in Africa if pandemic measures fail. As the disease has spread to almost all African states, the predominant risk factors for spread have been the degree of exposure, poor health systems, and the dense population found in urban centers [6].

The Democratic Republic of Congo (DRC) on Tuesday (March 10, 2020) recorded its first case of new coronavirus, becoming the eleventh African country affected by Covid-19 after Egypt, Algeria, Tunisia, Nigeria, Morocco, South Africa, Senegal, Togo, Cameroon and Burkina Faso [2,7]. Since then, the disease has spread to other provinces of the country. As of June 19, 2020, the Ministry of Health has recorded 5671 confirmed cases, including 125 deaths and 807 recoveries. Most cases are concentrated in the capital Kinshasa (5074 cases), other cases having been documented in the provinces of Congo-central (270 cases), Haut-Katanga (152 cases), Sud-Kivu (108 cases), Nord-Kivu (56 cases), Tshopo (3 cases), Kwilu (3 cases), Ituri (2 cases), Haut-Lomami (1 case), Kwango (1 case) and Equateur (1 case). In total, 11 of 26 affected provinces [8].

The isolation of the capital Kinshasa since March 24, 2020, the epicentre of COVID-19 pandemic, has so far protected provinces that have increased their vigilance to prevent suspected cases from being infiltrated [7].

Mbujimayi, capital of Eastern Kasai Province, is a city located in the central-East of the country (see Figure 1 below) which has not yet been affected by COVID-19. However, 19 people were quarantined in a local medical facility following their contacts with a woman from Belgium who had been in the city since 20 March and died a few days later of coronavirus in Kinshasa. According to the investigation, she died of another disease and not COVID-19. Samples of the 19 suspected cases were tested negative at the National Institute of Biomedical Research (INRB) [9].

The city of Mbujimayi presents a worrying health and economic situation. In terms of health, it has 10 health zones divided into 167 health areas with 577 operational medical facilities. There are places to pinpoint gaps in the medical field such as: the dilapidation of health infrastructure; the equipment has been dilapidated; a malfunction in sanitary hygiene; then on-viability of the structures' establishments; the misallocation of care facilities. On the economic front, the city of Mbujimayi

suffers excruciatingly from the inadequacies of certain fundamentals, including basic infrastructure. To this day, it remains essentially extroverted, i.e. dependent on the outside world for its supply of commodities as well as certain materials and inputs necessary for its production apparatus. The few economic operators present are more in clothing, food, diamond, pharmacy, cell phones etc. [10].

This study aimed to determine, through a descriptive survey of the population of the city of Mbuji mayi, factors that could be considered to improve the fight against Covid-19 in this part of the DRC. The purpose of this survey was to assess the knowledge, public views, attitudes and beliefs related to the COVID-19 pandemic among the population of Mbuji mayi.

## 2 Method

### 2.1 Study Context

This study was conducted in Mbuji mayi, which is the capital city of the province of Eastern Kasai in the DRC (Figure 1). Moreover, it is the third-largest city in terms of population, after Lubumbashi and Kinshasa. Mbuji mayi's 2020 population is now estimated to be 2,525,263 (Mbuji mayi-population.data-2020), with an area of 135.12 km<sup>2</sup> and a population density of 12,441 inhabitants/km<sup>2</sup>.

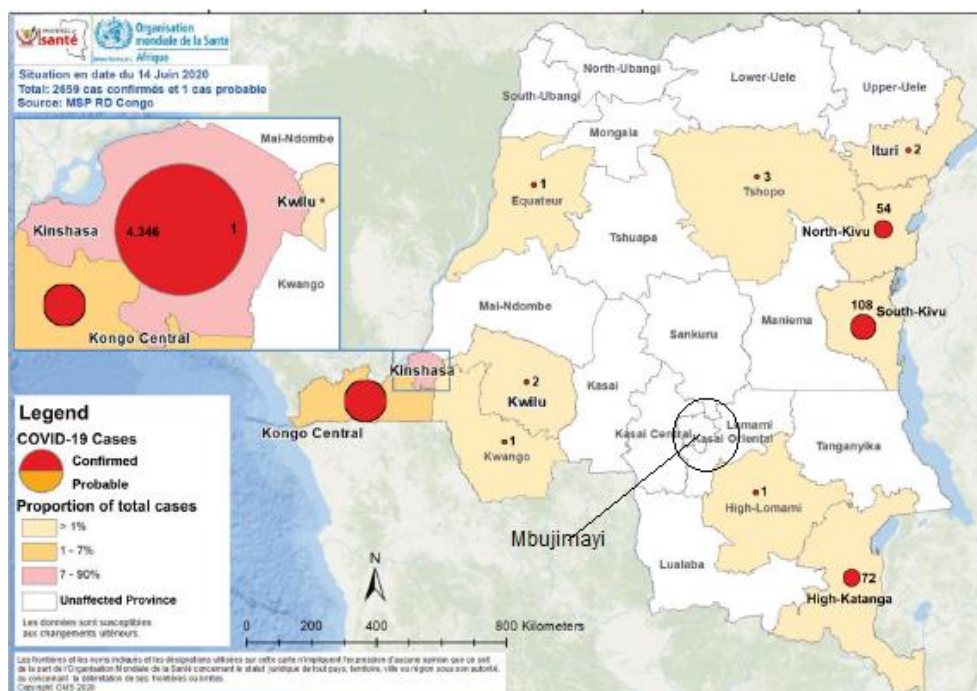


Figure 1. Breakdown of COVID-19 cases in DRC, the 11 provinces that reported cases on 14 June 2020, [7]

The DRC, which has a population of 99.9 million [11] and more than 500,000 refugees from neighboring countries, recorded the first confirmed case of COVID-19 in Kinshasa on 10 March 2020 [8]. In response to this worrying situation, the Government activated a Public Health Emergency Operations Centre (COU-SP) for coordination, preparation, and response to COVID-19. It aims to "interrupt the transmission of COVID-19 and minimize its health and socio-economic impact." A series of national measures were announced on 18 March 2020, including banning gatherings of more than 20 people in public places; The suspension of cults and sports activities; closure of schools, universities, restaurants, bars, etc., as well as restrictions on the movement of people (suspension of

flights from at-risk countries and transit countries), and border surveillance devices. These measures were accompanied by a strong awareness of barrier gestures such as handwashing with soap or hydroalcoholic gel, the physical distancing of at least 1.5 meters, wearing a mask etc. On 24 March, the Head of State declared a state of emergency, as well as the isolation of Kinshasa with the suspension of travel within the country [8]. The disease has spread to other provinces of the country, in total, 11 of 26 affected provinces as of June 19, 2020 [8]. Mbuji-Mayi is a city which has not yet been affected by COVID-19.

## 2.2 *Study design*

It is a cross-sectional study conducted in a Congolese city not yet affected by the pandemic at COVID-19 to assess the public views, attitudes and beliefs related to the COVID-19 pandemic. The survey took place from 17 April to 11 May 2020.

## 2.3 *Population and sample*

Random sampling was carried out in each commune and in each commune, we sorted every other avenue to interview the passers-by on the selected avenues. The investigations were carried out by 3 doctors and 2 medical students who had received a briefing on COVID-19 and the barrier measures, including handwashing, wearing a face mask and physical distancing. The investigators were divided one person per municipalities for the 5 of the city of Mbuji-Mayi (Bipemba, Dibindi, Diulu, Kanshi and Muya).

Included in this study were anyone 18 years of age or older and freely consenting to participate in the survey. Questionnaires excluded were those with less than 50% questions answered.

## 2.4 *Determining sample size*

The sample size was calculated using Epi Info Software (Version: 7.2.2.16) using a population survey in STATCALC. For a population of Mbuji-Mayi estimated at 2.500.000 inhabitants [11], a confidence interval of 95%, and expected prevalence of 50%(no previous study found)with a margin of error at 5% and a power at 2.0, we have a sample size of 768 people, which was divided into 154 people per commune. We had rounded to 160 people per commune for a total sample of 800 people for the 5 municipalities of the city of Mbuji-Mayi.

## 2.5 *Study settings and operational definitions*

The survey questionnaire was the data collection tool. It was designed by a team from the Faculty of Medicine at the University of Mbuji-Mayi and was validated on a pilot study of 30 people. The questionnaire looked at socio-demographic data (age, gender, province of origin, education level, work activity, etc.), attitudes and knowledge about coronavirus (definition of coronavirus 2019, symptoms or signs of COVID-19, barrier gestures, etc.), and finally about fears and beliefs about coronavirus.

Responses to the questionnaire were provided by passers-by. Only closed questions have been asked, either with one-time choices (e.g. does this coronavirus situation make you worried? yes/no) or multiple-choice (e.g. What do you think coronavirus is?).

The definitions operations have been adapted from WHO resources [2]. Coronavirus was defined as a natural virus-type microbe recently discovered in China. Signs or symptoms were fever, fatigue, dry

cough, for some patients: nasal congestion, runny nose, sore throat, or diarrhea. Risk factors were diabetes mellitus, high blood pressure, asthma, obesity, or any other chronic diseases such as kidney or heart failure. These risk factors were considered as well as by the declaration of the participants. Barrier gestures included regular handwashing with soap or ash, respecting a physical distance of at least 1.5 meters, avoiding shaking hands or other physical contacts, coughing, or sneezing in the elbows, and wearing a face mask in public or when showing signs.

#### *2.6 Data collection, management, and statistical analysis*

The data were collected during a face-to-face interview by trained and experienced interviewers. During this fieldwork, each investigator had a bottle of hydro-alcoholic gel for hand disinfection, they were required to wear the facial mask and observed a physical distance of 1.5 meters between investigators and interviewees during the entire interview.

The data collected was on paper questionnaires, then transcribed daily into an online google forms form to centralize the collected data. At the end of the survey, the data was extracted into a google sheets Excel file.

Statistical analysis of the collected data was done using epi Info<sup>TM</sup>7 (USA, CDC Atlanta, 2010) version 7.2. The data were, depending on the case, represented by the median or average and their confidence interval at 95%, for the numerical parameters and by the absolute or relative frequencies for the characteristic parameters. Qualitative variables were compared using the chi-squared test or fisher's exact test, as appropriate. The p-values < 0.05 are considered statistically significant.

#### *2.7 Ethical Approval*

The study protocol had been reviewed and approved by the Ethics Committee of the Medical Faculty at the University of Mbuji mayi (Fac-Méd / UM / CE / 003/2020). Informed consent was included at the beginning of the survey questionnaire. The questionnaire was anonymous and used for scientific purposes and the participant was free to participate or not and at any time during the questionnaire, he could stop his participation. The recording of the responses to the questionnaire did not contain any information that could identify the doctors interviewed, unless one of the questions was asked explicitly and they were free to fill in or not. If the interviewee has completed the questionnaire and has given his identity and contact details, he was assured that no information concerning his identity could be recorded in connection with his responses. There is no way to match the identities of the respondents with their responses on the questionnaire.

### **3 Results**

#### *1.1. Description of the study population*

This survey was carried out from 17 April to 11 May 2020 among 802 participants, 769 responses were recorded. The response rate was 96% (769/802). The average age was 36 ±14 years giving the majority (92%) was under 60 years old and only 8% were 60 years of age or older. The sex ratio (male: female) was 1.6. Most of the participants were married (57%), more than half (55%) had a university or higher education. Most participants lived in a household of more than 3 people (79%). In the month prior to the survey, 26% of participants were in contact with a person from areas already reported by WHO as already affected by COVID-19 (Locally in Kinshasa or Europe and China), and during the same period of the month prior to the survey participants would have developed the following symptoms without

any severity: fever (14%), Dry cough (9%), muscle pain (11%), fatigue (19%), throat irritation (6%), vomiting (3%), runny nose (6%), diarrhea (5%), however, the majority had no symptoms (62%). A minority reported having a family member living in Kinshasa or abroad had COVID-19 and 22% of participants lost a family member abroad who died of COVID-19. A minority of participants (23%) reported carrying a chronic disease listed as co-morbidity associated with COVID-19: diabetes mellitus (5%), high blood pressure (9%), obesity (3%), asthma (2%), other chronic diseases such as heart disease, kidney failure, etc. (3%) and the rest of participants (77%) had no co-morbidity. Co-morbidities were more common among people aged 60 and over (68%, 44/65) compared to those under 60 years of age (19%, 133/703), (Chi-square = 79.8, degree of freedom=1, p=0.0000).

### 1.2. Attitude et connaissance des enquêtés sur COVID-19

Half of participants first heard about Coronavirus 2019 in January 2020 and the source of information is the radio and/or television (67%), followed by social networks (Facebook, WhatsApp) in 22%, word of mouth (9%) and via a church (1%). Table 1 describes attitudes and knowledge about Coronavirus-2019. When asked "what is coronavirus 2019", 62% of participants answered that it is a natural virus, while for 26% of participants it is an artificial virus created in laboratories to reduce the world population.

TABLE 1. ATTITUDES AND KNOWLEDGE ABOUT CORONAVIRUS-2019

Parameters	N=769	%
<b>Knowledge of the signs of COVID-19</b>		
- Fever	641	83
- Fatigue	503	65
- Dry cough	633	82
- Throat irritation	398	52
- Difficulty breathing	642	83
<b>Knowledge of barrier measures against COVID-19</b>		
- Regular handwashing with soap or ash	646	84
- Physical distancing	546	71
- Wearing a face mask	469	61
- Staying at home	508	66
- Traditional treatment Prophylaxis	84	11
- Chloroquine prophylaxis	103	13
<b>Changes in habits since the beginning of the COVID-19 pandemic</b>		
- Regular handwashing with soap or ash	277	36
- Physical distancing	292	38
- Wearing a face mask	208	27
- Staying at home	354	46
- No change	484	63
<b>Hard-to-comply barrier measures</b>		
- Regular handwashing with soap or ash	534	69
- Physical distancing	408	53
- Wearing a face mask	501	65
- Staying at home	477	62
<b>Obstacle to compliance with barrier measures</b>		
- Water deficiency for hand washing	546	71
- Obligation to go out every day to support the family	632	82
- Entourage indifferent to barrier measures	215	28

### 1.3. Fears and beliefs

The results show that 97% of the participants believe in the real existence of COVID-19 and among them 66% fear that the disease will kill, while 24% fear because there is no treatment. Participants remain worried in 97% of the cases of the Coronavirus pandemic. However, 82% remain confident and optimistic about the favorable outcome of COVID-19 in Africa. The personal conviction of the participants towards COVID-19 shows that those who are convinced that it is a biological weapon (17%), a Western conspiracy for the depopulation of Africa (12%), a divine punishment (22%), witchcraft (2%), the hot climate protects against COVID-19 (55%). Also, 84% are convinced that the barrier measures are effective, and that half think that the authorities are well prepared to deal with COVID-19 and have taken the measures on time.

Regarding the possibility of vaccination against COVID-19, only 36% of the participants are in favor and 64% who oppose it. Among the reasons put forward by those who are against the possibility of vaccination, we note the following reasons: the testing of the anti-COVID-19 vaccine on Africans (35%), conspiracy to spread COVID-19 in Africa (38%), sterilize the African people (12%).

## 2. Discussion

The DRC declared its first case of COVID-19 on 10 March 2020 [2], since then, the disease has spread to other provinces of the country. In total, 11 of 26 affected provinces as of June 19, 2020 [8]. Mbuji mayi, the capital of Eastern Kasai Province is a city that has not yet been affected by COVID-19. This study was conducted among 769 people living in Mbuji mayi through a questionnaire. The objective was to assess the knowledge, public views, attitudes, and beliefs among population to determine the factors and strategies that could be considered to improve the fight against Covid-19 in this part of the DRC. The results of this study show that the population is aware of the existence of the COVID-19 pandemic, it is well informed about the signs of the disease, its severity and barrier measures, however few of them have adopted the change in habit and behavior in respect of the barrier measures. There is also false information and beliefs about COVID-19 in the community. These data show that the population of this unaffected region is insufficiently prepared to deal with COVID-19.

The participation rate was 96% (769/802) slightly higher than other surveys on COVID-19 [12,13], however, this study is a face-to-face survey whereas in similar studies they were online questionnaires via the internet. The average age of participants was  $36\pm 14$  years and mostly under 60 (92%) and male predominance (61%). These results correspond to the 25-54 age group that constitutes most of the population in the DRC [14]. In a study conducted in Kinshasa/DRC among patients affected by COVID-19, the average age was 34 years, with a predominance of the male sex (61%) [15]. Since the beginning of the pandemic, the World Health Organization was very concerned and feared chaos and is a time bomb of the pandemic at COVID-19 in Africa [16,17]. Yet, almost six months later, even though the number of cases continues to rise, it has still not exploded [2]. The death rate from COVID-19 is too low compared to developed countries [18]. One of the factors that could explain the absence of the chaos that has been predicted could be the young age of the African population [19]. Indeed, advanced age is one of the risk factors for poor prognosis in patients with COVID-19 [20]. The results of this study, as well as those of other studies [19], show that the average age in sub-Saharan Africa is less than 65 years (age at risk of COVID-19) [8]. As for the other different risk factors for bad prognostic of COVID-19 reported in the literature [8,20,21], including diabetes, asthma, obesity, chronic diseases (high blood pressure, kidney or heart failure, etc.), this study shows that a minority of

participants(23%) reported carrying a chronic disease listed as co-morbidity associated with COVID-19, including diabetes mellitus (5%), high blood pressure (9%), obesity (3%), asthma (2%), other chronic diseases such as heart disease, kidney failure (3%) and the rest of participants (77%) had no co-morbidity. Also, participants 60 years of age or older have more risk factors than those under 60 years of age ( $p < 0.05$ ). This confirms what is described in the literature that risk factors are more common in people 65 years of age or older [13,20,22–25].

In terms of the level of knowledge and attitudes about COVID-19, the majority of participants has informed on the signs of the disease and the barrier measures (see table 1) (> 50%) and 67% could define coronavirus 2019 as a natural virus. A study conducted in Ethiopia showed that the population has good information about the new pandemic with 83% of people who know the symptoms of COVID-19 [12]. This shows that the local media have done a good job because most of the population has good information about the symptoms of the disease, barrier gestures via radio or television news (see Table 1). However, this study also shows that there is persistence of false information and beliefs about Covid-19 in the community despite the awareness. A minority thinking that COVID-19 is an artificial virus created in laboratories to reduce the world's population. Other false information and beliefs encountered in this study that makes respondents reluctant to the possibility of an anti-COVID-19 vaccination: the new coronavirus 19 is a biological weapon (17%), a western conspiracy for the depopulation of Africa (12%), a divine punishment (22%), witchcraft (2%), the hot climate protects against COVID-19 (55%). Since the beginning of the pandemic in December 2019, many voices have been raised, especially via social networks for the misinformation of the population and so there is a lot of false information circulating, and WHO has been working on this since the beginning of the pandemic to denounce this false information and provide the right information to the population [2]. Unfortunately, there are still victims of this false information. In addition to the persistence of false information and beliefs, this study shows that very few respondents have changed habits and behavior since the onset of the pandemic. False information could explain this weakness in the application of barrier measures, however, there are also socio-economic difficulties including an entourage that does not respect the barrier measures, the lack of water for regular handwashing, the family pressure forcing people to leave their homes every day to find food. Other authors have also mentioned the lack of water and soap for regular handwashing being a difficulty in limited resources countries [3,26,27], socioeconomic difficulties [28], and the non-compliance with government measures, which is reported in the media [16,29]. All this false information reported in this study is listed on the WHO website [2,18] and relayed by the DRC's Covid-19 response team [8]. These false beliefs about the pandemic are most of the time responsible for a release of compliance with barrier measures [29].

In terms of fears and beliefs, 97% of the participants believe in the real existence of COVID-19 pandemic and remain worried. Among them 66% fear that the disease will kill, while 24% fear because there is no treatment. The fear and concern of the population about COVID-19 pandemic is sufficiently reported in several studies [28,30]. Despite the fear, this study showed that 82% remain confident and optimistic about the favorable outcome of COVID-19 in Africa. In difficult situations, it is sometimes rare to find people who keep hope. This is the case of a study conducted in the United Kingdom among health care workers, which shows that caregivers had feelings of despair, helplessness in the face of the uncertainty associated with the pandemic [31]. This could be explained by the fact that they are health personnel who face the realities of COVID-19 every day in their work with an appreciated knowledge of the situation whereas in our study, they are mostly non-medical



staff with vague knowledge of the disease and who have never been confronted with patients with COVID-19 in severe states. Other studies found similar results to ours and showing that participants held positive feelings of hope [32].

Finally, this study shows that most participants are not in favor of the possibility of vaccination against coronavirus-2019 (64%). This could be explained by the propaganda of false information (WHO), and it is visible in the responses of the vaccine refusal. Among the reasons put forward by those who are against the possibility of vaccination, we note the following reasons: the testing of the anti-COVID-19 vaccine on Africans (35%), conspiracy to spread COVID-19 in Africa (38%), sterilize the African people (12%). This goes back to the study by Emily Harrison et al. which suggests the need to re-imagine communication strategies to regain the trust of the population and communities concerned with vaccination [33].

This study could present a motivational bias of social desirability. This bias refers to the fact that the respondent will try to give the interviewer a positive image of himself. Indeed, this is a study where the interviewer is in a face-to-face relationship with the interviewee where he asks the questions and records the answers. Also, it was a closed questionnaire, the questions and the list of proposals to be submitted to the participant are fixed in advance and the interviewee did not have much freedom to express themselves, since they must comply with the pre-established assertions.

The results of this study provided a good understanding of the factors that stand in the way of community preparedness for the possible spread of the pandemic in provinces not yet affected by COVID-19. Although the government has already done all it can medically and sensitized, some gaps need to be improved. The involvement of civil society organizations (churches, non-governmental organizations, student clubs, etc.) in raising awareness would be an opportunity, the adaptation of the awareness message not only to popularize the barrier measures, but to raise awareness of the importance of these measures and to combat false information and beliefs and replace them with the right information. Advocacy would also be needed with the political and administrative authorities to resolve the problem of water deficiency during this period of the COVID-19 pandemic.

### 3. Conclusion

The results of this study show that in the cities not yet affected by COVID-19 in the DRC, the population is informed about the disease and the barrier measures, however, the persistence of false information and rumors about COVID-19 has had a very negative impact, resulting in the relaxation of the observance of barrier gestures. The lack of water for handwashing is the major difficulty that has been reported. It is important to increase awareness on barrier measures, combating false information about COVID-19, and improving regular water supply for regular handwashing.

**Author Contributions:** B.M.M. initiated and coordinated the study until the publication, correction and finalization of the manuscript. He is the main author of the study, of the questionnaire design. S.L.D. contributed to the data collection, drafting the article and in the correction. D.K.M., E.L.K., R.C.M., and T.B.M. all contributed to the data collection and interpretation until their publication. G.T.D. participated in the proofreading and certain practical orientations, he brought important criticisms for improving the content and form the guidance and support for publication. All authors also declare that they have read and approved the final version of the manuscript.

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