

Knowledge, perception and practices of wearing a mask against Covid-19 in the population of Brazzaville, from March to December 2020

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Abstract- Introduction

After the first case on March 14, 2020, in Republic of Congo, the responsibility of the population in the prevention of Covid-19, goes through the understanding of the factors of the bad wearing of the mask. Our survey aimed at analyzing the explanatory factors of the poor wearing of masks in the prevention of Covid-19.

Methodology

This study descriptive cross-sectional was conducted in the city of Brazzaville and Data collection was conducted from December 28 to January 22, 2021. The study population consisted of people wearing masks to prevent Covid-19. Verbal informed consent for participation in the study was obtained from respondents prior to the collection of information.

Results

The majority of the respondents said that the purchase of the mask is within the reach of everyone (75.17%), the medical mask is used by 383 individuals or (53.12%) and the cloth mask by 324 individuals or (44.94%). The wearing of the mask is not dangerous (66.71%) and the main reason for wearing the mask was to protect against coronavirus for 92.23% individuals. The ideal condition for wearing the mask was in front of an audience for 94.87% of individuals interviewed. Up to 403 individuals (55.89%) applied mask recycling.

Discussion

In our study, the majority of individuals who agreed to take the survey were men, which may be due to the fact that the survey was conducted in the street, as men are more likely to stop in the street to answer a question than women. Good knowledge about modes of transmission and types of masks can be traced back to the various community awareness campaigns in official and local languages.

Although there is a significant proportion of individuals who knew how to wear their mask from nose to mouth, some individuals revealed that the mask is worn only at the mouth (1.53%).

Conclusion

Mask use continues to expand at a rapid pace until early 2021. While the Congolese government has chosen to impose masks on the general public in their streets, in public spaces, it is now instituted as a "basic rule" in closed and shared spaces.

I. INTRODUCTION

On December 31, 2019, the World Health Organization (WHO) was alerted to cases of pneumonia of unknown origin occurring in Wuhan, Hubei Province, China (Ge et al. 2020 ; She et al. 2020). On January 7, 2020, these pneumonia cases were classified as related to a newly emerged coronavirus, SARS-CoV-2 (Zheng 2020). Because of its magnitude, this new coronavirus was declared a public health emergency of international concern (Durrheim et al. 2020). In March 2020, this disease became a pandemic (Cucinotta and Vanelli 2020), then the WHO declared Europe as the epicenter of the pandemic (Worobey et al. 2020). The Republic of Congo notified its first case of 2019 coronavirus disease (Covid-19), on March 14, 2020, one month after the first case in Africa was confirmed in Egypt (Lone and Ahmad 2020). The state of health emergency throughout the territory was declared on March 30, 2020 following the decree number 2020 of March 30, 2020 (Ministry of Tourism and Environment 2020). After the declaration of the first case on March 14, 2020, the number of people affected by Covid-19 also rapidly increased to 8419 cumulative cases as of February 10, 2021 (Ministry of Health, Population 2021).

A study conducted by Le Dang et al (2004) reported that the use of face masks had an important role in controlling the transmission of SARS-COV (Le et al. 2004). Because SARS-COV is a disease with similar transmission to Covid-19, mask wearing is an ideal solution for the response against Covid-19 (Howard et al. 2021).

Similarly, masks have been recommended to the Congolese population to prevent the spread of Covid-19 (Howard et al. 2021), as they are intended to prevent the projection of upper airway

secretions or saliva that may contain transmissible infectious agents when the wearer exhales. Its real application has many difficulties. A recent study conducted at the Departmental Health Directorate of Brazzaville, reports that 60% of the Congolese population does not properly wear the mask as recommended by the government.

Widespread wearing of masks should be encouraged and made mandatory in all public spaces in Africa (Feng et al. 2020). Masks should also be made available free or at a low, controlled price (Howard et al. 2021). The CDC now recommended a "face mask" in public spaces (Honein et al. 2020). In this context, strict measures for the use of face masks have emerged in several African countries.

The responsibility of the population in the prevention of Covid-19, goes through the understanding of the factors of the bad wearing of the mask, the sensitization and finally the respect of the guidelines. However, the population is not always aware of the existence of Covid-19 and therefore of the preventive measures, particularly the proper use of masks. Therefore, its application is not always effective. However, knowledge and communication on the proper use of masks is poorly documented in Congo. Hence the need to document the explanatory factors of the poor wearing of masks in the prevention of Covid-19 among the population of Brazzaville. It is for this reason that we will undertake this work. Its goal will be to identify the bottlenecks of the correct wearing of the mask in the prevention of Covid-19 in order to improve in a relevant way the attitudes of the populations of Brazzaville on the wearing of the mask and why not potentially beyond.

The fight against Covid-19 is confronted with a negative opinion on the reality of the disease. Indeed, many people think that this disease does not exist. In doing so, they display attitudes that are resistant to the correct wearing of the mask. Some people put the mask on their neck, not protecting their airways. The people of Brazzaville do not wear masks as recommended by the government. Therefore, the problem of wearing masks is acute. What are the factors of the poor wearing of masks to protect oneself from Covid-19 in Brazzaville in 2020? Our survey aimed at analyzing the explanatory factors of the poor wearing of masks in the prevention of Covid-19 in the population of Brazzaville in 2020.

II. METHODOLOGY

This was a descriptive cross-sectional study. This study was conducted in the city of Brazzaville (capital of the Republic of Congo) in four districts, namely Makélékélé (1), Ouenzé (5), Talangai (6) and Mfilou (7). The study took place from April 10, 2020 to January 31, 2021. Data collection was conducted from December 28 to January 22, 2021.

The study population consisted of people wearing masks in the different districts of Brazzaville to prevent Covid-19. The people who were included will meet the following criteria:

- Have given informed consent (written)
- Have worn the mask continuously for at least 6 hours
- Have worn the surgical or homemade fabric mask.

Individuals who gave informed consent, but were subsequently unavailable to participate in the survey. This was a non-probability method. The study population was selected by simple random draw. The sampling technique consisted of

consecutive recruitment to individuals meeting the inclusion criteria, residing in Brazzaville (Makélékélé, Ouenzé, Talangai and Mfilou) and consenting to participate in the study.

We determined the sample size with the prevalence of 50% because we did not find any prevalence in the literature. Thus, the sample size was determined by the Schwartz formula, with the risk of error $\alpha = 0.05$, for a confidence interval (95% CI) as well as the constant value $Z\alpha = 1.96$ according to the normal distribution table. The prevalence was estimated to be 50%.

The formula is applied: $N = (Z\alpha \cdot P \cdot q) / E$, on a $N = (1.96)^2 \times 0.5 \times 0.5 / (0.05)^2$

$$N = 3.8416 \times 0.5 \times 0.5 / 0.0025$$

$$N = 3.8416 \times 0.25 / 0.0025$$

$$N = 0.9604 / 0.0025$$

$$N = 384.16$$

$$P = 50 / 100 = 0.5$$

$$q = 1 - 0.5 = 0.5$$

$$N = 384.16 = 384$$

Multiplying the sample size by the cluster effect, using cluster sampling, we have: $N \times D = 384 \times 2 = 768$

To improve non-response and/or registration errors, 5% was added to the sample.

$$N + 5\% = 768 + 38.4 = 806.4 = 806$$

The study variables were: gender - age - education level - occupation - type of masks - discomfort setting - duration of mask wearing - importance of mask wearing - knowledge about the importance of mask wearing - knowledge about Covid-19 - mode of virus transmission - mask removal - occurrence of headache - choking. Data were collected from a pre-designed paper questionnaire that was tested before the survey began. This questionnaire will be anonymous. The interviewers were trained to fill in the questionnaire. The data were entered and stored in the Epi-Info software, version 7.2. This software was also used for analysis. The quantitative variables were represented as mean and + or - standard deviation with extreme values. On the other hand, the qualitative variables were represented in the form of numbers and percentages. The interview was conducted in a friendly environment and respected confidentiality. The respondent was made to feel confident and informed of the purpose of the study and its implications. In case of difficulties in understanding the terms, they could be translated into the local language for a better understanding.

III. ETHICAL CONSIDERATIONS

The study was approved by the CIESPAC Scientific Ethics Committee. Verbal informed consent for participation in the study was obtained from respondents prior to the collection of information. The information collected was anonymous and uncorrelated. It was stored on a computerized medium that guaranteed the security and confidentiality of the data. Administrative authorization was obtained from the CIESPAC management and from the Brazzaville departmental health office.

IV. RESULTS

The distribution of the study population by gender, males were in the majority (57.98%) to participate in the survey. Single individuals were the most important while the most observed level of study was university. A total of 453 (62.83%) individuals were unemployed (**Table 1**).

Regarding the history related to respiratory diseases, 12.21% mentioned the presence of asthma in their history while only 9.57% presented the other respiratory diseases (**Table 2**). There were 717 (99.45%) who had ever heard of Covid-19. The modes of transmission and types of protective masks for Covid-19 were widely known in the study population, 94.04% and 94.17% positive responses respectively (**Table 3**).

The majority of the respondents said that the purchase of the mask is within the reach of everyone (75.17%), the medical mask is used by 383 individuals or (53.12%) and the cloth mask by 324 individuals or (44.94%). When asked how to put on the mask, 706 (97.92%) individuals answered from nose to mouth, only 530 (73.51%) threw away the mask after use (**Table 4**).

The wearing of the mask is not dangerous (66.71%) and the main reason for wearing the mask was to protect against coronavirus for 92.23% individuals. The ideal condition for wearing the mask was in front of an audience for 94.87% of individuals interviewed. The maximum time for wearing the mask was one day for 291 individuals (40.36%). Up to 403 individuals (55.89%) applied mask recycling. There were 384 individuals (53.26%) who were unaware of the consequences of wearing masks, but 444 (61.58%) felt that wearing masks did not provide sufficient oxygenation. The majority did not wear a mask during their activity 595 (82.52%) (**Table 5**).

Regarding the measures taken by the government, (78.22%) agreed with the measure of wearing a mask to control the coronavirus, and made use of the barrier measures issued by the government (78.22%). There were 52.70% of individuals who thought that the control of coronavirus is not controlled (**Table 6**). Up to 337 (46.74%) stated that there were consequences after wearing the mask, 423 (58.67%) responded positively about having difficulty breathing with the mask and the subsequent discomfort (41.75%) and choking (38.83%) (**Table 7**).

The table below reveals that respondents relied on the wearing of masks as a means of protection at home, particularly to avoid contaminating the family (54.23%), effective means of protection with regard to the family (74.76%), requirement of the wearing of masks for visitors (55.48%) and finally the respect of those around them for the wearing of masks (61.17%) (Table 8).

V. DISCUSSION

The response to the coronavirus pandemic throughout the world is not only at the hospital level. Prevention plays a major role and is largely based on the implementation of barrier measures: social distancing, use of soap or hydroalcoholic gel, decontamination of surfaces, confinement, and wearing of masks. The use of masks continues to spread at a rapid pace. The consumer mask, now a key element in the prevention of Covid-19, has become an everyday object. The correct wearing of the mask is a guarantee of its effectiveness.

In our study, the majority of individuals who agreed to take the survey were men, which may be due to the fact that the survey was conducted in the street, as men are more likely to stop in the street to answer a question than women. Most did not have a respiratory history, which is relatively encouraging, one study found that Covid-19 is more common and severe in people with chronic lung disease (Schultze et al. 2020).

After more than 11 months of the pandemic, that there are still individuals, we have great doubt. This result does not reflect the environmental reality, where all strategies have been implemented to popularize, and communicate about the pandemic. We believe that there was a negligent impulse in the way this question was answered, for those who answered that they had never heard of Covid-19. Good knowledge about modes of transmission and types of masks can be traced back to the various community awareness campaigns in official and local languages.

There are different types of masks, related to distinct uses (Howard et al. 2021). While they are very effective in preventing airborne and droplet transmission risks, they are quite uncomfortable to wear lengthwise (Esposito et al. 2020). Fabric mask use was considerable in our population. The fabric mask, despite its lesser effectiveness, is now emphasized because it is reusable, and therefore able to withstand a crisis situation that is likely to last. Although there is a significant proportion of individuals who knew how to wear their mask from nose to mouth, some individuals revealed that the mask is worn only at the mouth (1.53%). When improperly positioned, a mask loses all utility (Matuschek et al. 2020).

The use of the mask, whether disposable or reusable, is the same. Indeed, the purpose of the mask is to trap as much as possible the projection of secretions from the upper airways or saliva that may contain transmissible infectious agents. Studies have shown that it is important to wear a mask in crowded places such as shops or transport (Feng et al. 2020). In our study, a small proportion of individuals (2.92%) responded that mask wearing occurred in a meeting. Wearing a mask in a confined space remains a measure that should provide safety for all individuals in that space. For optimal use, a surgical or consumer mask should be changed every 3 hours or as soon as it becomes wet (Chua et al. 2020). Indeed, the moisture of the breath accumulated several hours on the fabric makes it less filtering and thus less effective. In addition, a humid fabric "can cause a respiratory resistance which pushes to touch it, to reposition it" to regain comfort, and thus multiplies the risks of contamination by contact.

Wearing a mask not only limits contagion by retaining the particles emitted by the wearer, but also protects those around him. Since some people carrying the virus are asymptomatic, the generalized wearing of masks considerably reduces the risk of contagion (Howard et al. 2021). The mask appears to be an element that protects the person's environment, and is therefore an altruistic object, but it is also an individual protection (Chua et al. 2020). Levers to facilitate and encourage adherence to mask wearing have been identified:

- The effectiveness of the mask against the epidemic (Howard et al. 2021), which, according to the respondents, allows them to protect themselves and others;
- The symbolic nature of the mask, which reminds us that we are living in a period of health crisis and that it is therefore necessary to apply barrier measures;

- The mandatory nature of the measure, including for the minority of people who do not wish to wear one;
 - The quality of the mask: comfort, price and the absence of undesirable effects due to the components of the mask.
 Obstacles to the generalization of and compliance with the wearing of masks were also noted:
 - Physical discomfort (choking, shortness of breath, itching.) and habit changes (physical habituation, gestures to learn and respect...) (Di Renzo et al. 2020). In the end, these pitfalls are more related to the discomfort caused by wearing the mask than to major impeding factors;
 - Duration of mask effectiveness (Howard et al. 2021): those who wear masks to date do so for short periods of time;
 - The effectiveness of wearing the mask remains questionable and therefore remains to be demonstrated: many participants believe that the protection provided by the mask is partial;
 The gestures relating to the use and fitting of the mask on the face seem to be generally well known by the participants, given the current level of communication on the response to the epidemic. However, their systematic application is lacking, in particular knowing how to position the mask so that it covers the nose up to the bottom of the chin and to continue practicing the distance;

VI. CONCLUSION

Mask use continues to expand at a rapid pace until early 2021. While the Congolese government has chosen to impose masks on the general public in their streets, in public spaces, it is now instituted as a "basic rule" in closed and shared spaces, such as administrative offices. For it to be effective, it must be worn according to the rules of the art.

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Table 1 : Characteristics of the surveyed population

| Variables | | n(%) | IC, 95% |
|-----------------------|----------|--------------|-------------|
| Gender | Female | 303 (42,02%) | 38.47-45.66 |
| | Male | 418 (57,98%) | 54.34-61.53 |
| Marital status | 1 | 468 (64.91%) | 61.36-68.31 |
| | 2 | 46 (6.38%) | 4.82-8.41 |
| | 3 | 175 (24,27%) | 21.28-27.53 |
| | 4 | 19 (2.64%) | 1.69-4.08 |

| | | | |
|---------------------------|----------|--------------|-------------|
| | 5 | 13 (1,80%) | 1.06-3.06 |
| Level of education | 1 | 43 (5.96%) | 4.46-7.94 |
| | 2 | 278 (38.56%) | 35.07-42.16 |
| | 3 | 350 (48.54%) | 44.91-52.19 |
| | 4 | 47 (6.52%) | 4.94-8.56 |
| | 5 | 3 (0.42%)* | 0.14-1.22 |
| Profession | 1 | 453 (62.83%) | 59.24-66,28 |
| | 2 | 138 (19.14%) | 16.43-22.17 |
| | 3 | 106 (14.70%) | 12.30-17.47 |
| | 4 | 24 (3.33%) | 2.25-4.91 |

Table 2 : Characteristics on respiratory disease history

| Variables | | n (%) | IC, 95% |
|-----------------------------------|-----|--------------|----------------|
| Asthma | Yes | 88 (12.21%) | 10.01- 14.80 |
| | No | 633 (87.79%) | 85.20-89.99 |
| Other respiratory diseases | Yes | 69 (9.57%) | 7.63-11.94 |
| | No | 652 (90.43%) | 88.06- 92.37 |

Table 3 : Characteristics of the population regarding their knowledge of COVID-19

| Variables | | n (%) | IC, 95% |
|--|-----|--------------|----------------|
| Have heard of COVID-19 | Yes | 717 (99.45%) | 98.58-99.78 |
| | No | 4 (0.55%) | 0.22-1.42 |
| Knowledge of modes of transmission | Yes | 678 (94.04%) | 92.06-95.54 |
| | No | 43 (5.96%) | 4.46-7.94 |
| Knowledge of the types of masks to protect against COVID-19 | Yes | 679 (94.17%) | 92.22-95.66 |
| | No | 42 (5.83%) | 4.34-7.78 |

Table 4: Characteristics related to the protective mask

| Variables | | n (%) | IC. 95% |
|---|--------------------|--------------|----------------|
| The mask can be purchased by anyone | Yes | 542 (75.17%) | 71.89-78.19 |
| | No | 179 (24.83%) | 21.81-28.11 |
| The type of mask used | Fabric | 324 (44.94%) | 41.34-48.59 |
| | Respirator | 14 (1.94%) | 1.16-3.23 |
| | Medical | 383 (53.12%) | 49.47-56.74 |
| How to put on the mask | From nose to mouth | 706 (97.92%) | 96.60-98.74 |
| | Mouth only | 11 (1.53%) | 0.85-2.71 |
| | To the chin | 4 (0.55%) | 0.22-1.42 |
| What do you do when the mask is no longer needed or useful? | You throw it away | 530 (73.51%) | 70.17-76.60 |
| | You clean it | 79 (10.96%) | 8.88-13.45 |
| | You burn it | 112 (15.53%) | 13.07-18.36 |

Table 5 : Characteristics related to mask wearing conditions

| Variables | | n (%) | IC. 95% |
|-----------------------------|--|--------------|----------------|
| Wearing a mask is dangerous | Yes | 240 (33.29%) | 36.30-43.42 |
| | No | 481 (66.71%) | 56.58-63.70 |
| Reasons to wear a mask | Protection against coronavirus | 665 (92.23%) | 90.05- 93.97 |
| | No contamination of other respiratory diseases | 38 (5.27%) | 3.86-7.15 |
| | To escape from odours | 18 (2.50%) | 1.58-3.91 |
| When to wear the mask | In front of an audience | 684 (94.87%) | 93.01-96.25 |

| | | | |
|--|---|--------------|-------------|
| | In the bedroom | 16 (2.22%) | 1.37-3.57 |
| | At a meeting | 21 (2.92%) | 1.69-4.08 |
| Wearing a mask is : | Not useful for protection against the coronavirus | 85 (11.79%) | 9.64-14.35 |
| | Not able to protect effectively against the virus | 192 (26.63%) | 23.53-29.97 |
| | does not allow sufficient oxygenation | 444 (61.58%) | 57.98-65.06 |
| The maximum time for wearing the mask | 2 hours | 36 (4.99%) | 3.63-6.84 |
| | 3 hours | 128 (17.75%) | 3,63-6,84 |
| | 4 hour | 266 (36.89%) | 33.45-40.48 |
| | 1 day | 291 (40.36%) | 36.84-43.98 |
| Wearing the mask is recycled | Yes | 403 (55.89%) | 52.25-59.48 |
| | No | 318 (44.11%) | 40.52-47.75 |
| Consequences after wearing the mask | Yes | 337 (46.74%) | 43.13-50.39 |
| | No | 384 (53.26%) | 49,61-56.87 |
| During your activity, you wear the mask over your nose and mouth | Yes | 126 (17.48%) | 14.88-20.42 |
| | No | 595 (82.52%) | 79.58-85.12 |

Table 6 : Characteristics related to mask compliance

| Variables | | n (%) | IC. 95% |
|--|-----|--------------|--------------|
| In accordance with the government's mask measure to combat the coronavirus | Yes | 564 (78.22%) | 75.07-81.08 |
| | No | 157 (21.78%) | 18,92-24,9 |
| Use of the government's barrier measures | Yes | 564 (78.22%) | 75.07- 81.08 |
| | No | 157 (21.78%) | 18.92-24.93 |
| The fight against the coronavirus is controlled | Yes | 341 (47.30%) | 43.68-50.94 |
| | No | 380 (52.70%) | 49.06-56.32 |

Tableau 7 :

| Variables | | n(%) | IC. 95% |
|---|---------------------|--------------|-------------|
| Are there any consequences after wearing the mask | No | 384 (53.26%) | 49.61-56.87 |
| | Yes | 337 (46.74%) | 43.13-50.39 |
| Difficulty breathing with the mask on | Yes | 423 (58.67%) | 37.79-44.96 |
| | No | 298 (41.33%) | 37.79-44.96 |
| Feeling when wearing the mask | Choking | 280 (38.83%) | 35.35-42.44 |
| | Shortness of breath | 76 (10.54%) | 8.50-13,00 |
| | Slowed breathing | 53 (7.35%) | 5.66-9.49 |
| | Headache | 11 (1.53%) | 0.85-2.71 |
| | Discomfort | 301 (41.75%) | 38.20-45.38 |

Table 8 : Characteristics of mask use in the home

| Variables | | n (%) | IC. 95% |
|--|-----|--------------|-------------|
| If you have clinical signs of COVID-19, wearing a mask will prevent your family from becoming infected | Yes | 391 (54.23%) | 50.58-57.83 |
| | No | 330 (45.77%) | 42.17-49.42 |
| Wearing a mask is an effective way to protect your family from COVID-19 | Yes | 539 (74.76%) | 71.46-77.79 |
| | No | 182 (25.24%) | 22.21-28.54 |
| At home, the wearing of a mask is required for visitorsPeople around you must also wear a mask | Yes | 400 (55.48%) | 51.83-59.07 |
| | No | 321 (44.52%) | 40.93-48.17 |
| People around you must also wear a mask | Yes | 441 (61.17%) | 57.56-64.65 |
| | No | 280 (38.83%) | 35.35-42.44 |

