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## Association Between Face Masks Use and Occupation in Cameroon: Perceived Susceptibility to COVID-19 and Physician's Roles

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## ABSTRACT

**Introduction:** Face masks use among Cameroonians is a new behavior. Many citizens have adopted face masks as a step to prevent the spread of COVID-19. Individuals might use face masks because of their profession, risk perception, and social status. This study aims at evaluating the relation between occupation and face masks use in COVID-19 setting in Cameroon. Our study hypothesizes that face masks use is not associated with occupation in Cameroon.

**Methods:** A survey was conducted from May 13 to June 3, 2020, among Cameroonians ranging from ages 15 to 66+. Participants answered questions regarding face mask use, occupation, perceived susceptibility to COVID-19, and physicians' guidance. A binary logistic regression analysis was used to examine the association between face masks use and occupation.

**Results:** A total of 1,525 persons responded to the survey among 837 males and 688 females. After adjustment, face masks use was not associated with the occupation. Guidance provided by physicians were positively associated with face masks use (OR=2.06, 95%CI:1.48-2.85). Face masks use was also associated with reported answers on whether: face masks protect against COVID-19 (OR=10.48, 95%CI: 7.20-15.25), ability to easily access physician's guidance about COVID-19 on social media (OR=2.70, 95%CI: 1.94-3.75), and the belief that Africans are naturally resistant to COVID-19 (OR=1.73, 95% CI: 1.13-2.65).

**Conclusions:** Our study provides evidence that face masks use in COVID-19 setting in Cameroon is not associated with occupation. However, physicians' role has an impact on people's behavior. The association between face masks use and the belief that Africans are naturally resistant to COVID-19 points to low perceived susceptibility that needs to be addressed by health professionals and competent civil authorities.

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## 1. INTRODUCTION

SARS-CoV-2, which causes COVID-19 can spread through direct contact with infected objects or from person to person when a sick individual sneeze, breathes, talks, or coughs [1, 2]. The perception of risk or susceptibility to diseases is generally associated with preventive measures [3, 4]. During the influenza season and periods of respiratory infectious disease outbreaks, many people in Asian countries wear face masks intending to prevent disease spread as face masks can reduce the spread of respiratory infections [5-8]. In states that are often affected by seasonal respiratory infectious disease, wearing face masks can also be associated with professional activities or occupations. Individuals in some professions (i.e., healthcare) might be more inclined or even required to use face masks at their workplace and in public [5, 8]. In an attempt to prevent COVID-19, face masks can be used to stop infected persons from spreading the virus to healthy persons [8]. The type of cover plays a vital role in this situation. Cloth masks mainly prevent a person from spreading the disease through respiratory droplets. In contrast, surgical masks can prevent the spread of the infection and protect the mask user from being infected [9, 10].

As COVID-19 continues to spread in Cameroon, it is essential to note that face masks use is not a widespread behavior among Cameroonians. It is crucial to determine what groups in the population are less likely to wear face masks to direct more efforts and resources towards

engaging these groups. This study aims at examining the association between occupation and face masks use in COVID-19 setting in Cameroon. To that end, the study also evaluates the general public's belief about face masks, their perceived susceptibility to COVID-19, and the role of health professionals in addressing the ongoing pandemic.

### 1.1. SOCIAL MEDIA AND HEALTH PROFESSIONAL'S ROLE

Social media, which is a medium for communication, sharing ideas, and real-time collaboration between persons, has become central in the way people and societies relate [11, 12]. In Cameroon, social media sites like Facebook, WhatsApp, and YouTube are essential channels of information. In the world at large and Cameroon in particular, the use of social media has increased in past decades thanks to smartphones [11, 13-15]. Even state media channels, like the Cameroon Radio Television (CRTV), have recently incorporated social media in their strategy to reach a larger group of Cameroonians. Social media is particularly useful for physicians and other health professionals to get updated or engage with the public and other colleagues as they use it to convey health information, promote healthy behaviors, and boost good health outcomes [11, 16, 17]. In the context of COVID-19, many Cameroonians may begin to utilize social media more frequently as a source of information about the disease. Social media represent an essential component for health professionals in their fight against COVID-19, fake news, and in their role as health educators [11, 18].

## 2. METHODS

### 2.1. STUDY SETTINGS

Cameroon is a West-Central African country, which is often referred to as miniaturized Africa. Thanks to its diversity in terms of ethnicity, climate, landscape, flora and fauna, religion, and languages to mention but a few [19]. Cameroon's population is very young with a rapid growth rate, similar to the rate observed in Sub-Saharan Africa, with more people living in urban areas and less in rural [19]. As of Friday, July 20, 2020, Cameroon's population was 26,545,863 with a birth and a death rate below the sub-regions average [19, 20].

### 2.2. COVID-19 TREND IN CAMEROON

The first COVID-19 case in Cameroon was confirmed on March 6, 2020, and as of July 20, 2020, Cameroon had 16,157 confirmed cases of COVID-19 with a total death toll of 373 and 13,728 recoveries [21, 22]. Although case and death rates in Africa are still low compared to North America and Europe [23], Cameroon presents some alarming figures. Cameroon is now catching up with Algeria, which had one of the most elevated infection rates in Africa between March and April 2020; Cameroon also has more cases than Congo Kinshasa, Kenya, Angola and Cote d'Ivoire [23]. A study by Akawa Exodus et al., suggests that there is still a great need to educate the Cameroonian public regarding Coronavirus's ways of transmission and how to prevent and manage contamination [24].

### 2.3. POPULATION CHARACTERISTICS AND DATA COLLECTION

An anonymous survey was administered to Cameroonians and people living in Cameroon from May 13 to June 3, 2020, in three Cameroonian cities: Douala, Nkongsamba, and Yaoundé. Respondents self-identified either as male or female. The respondents' total number was 1,525, with ages ranging from 15 to 66+ years old. The optimal sample size was calculated using Sample Size Calculator 2004 version powered by Raosoft, Inc. The calculation was based on the 2020 population of Cameroon [25]. The obtained sample was constituted of participants that fully answered the questionnaire. All participants fully answered the questionnaire; hence no missing data was observed. Due to physical distancing measures, the questionnaire was answered by respondents and directly recorded on the questionnaire form by the interviewers. The questionnaire was first designed in French and then translated into English. It was administered either in French or English to accommodate both English and French-speaking Cameroonians.

### 2.4. STUDY DESIGN AND VARIABLES

This is a cross-sectional study design. Demographic variables include age in years categorized as 15-25, 26-35, 36-45, 46-55, 56-65, 66+, and sex classified as male and female. Other variables are based on questions including occupation in 3 categories, which are education as high school students and college students, employees or people with fixed income, and self-employed or people without a fixed income. The use of face masks against COVID-19, the belief about face masks capability to protect against COVID-19, the usefulness of physicians guidance, the ability to obtain health information about COVID-19 posted on social media by physicians, the trust in information provided by Cameroon government on COVID-19, the perceived susceptibility, and the use of African tisanes to treat or prevent COVID-19. The variables used for this study are recorded in Table 1.

Sex
Age
Occupation
Do you use a face mask as protection against COVID-19? Coded as "usefm"
Do you believe wearing a face mask provides protection against COVID-19? Coded as "fmprotect"
Do you easily find information from physicians about COVID-19 on social media? Coded as "easyinfo"
Do information and guidance from physicians help you to protect yourself and others against COVID-19? Coded as "infohelp"

### 2.5. STATISTICAL ANALYSIS

The prevalence of face mask use in the population was evaluated, and frequency tables were generated for each variable in Table 1. It treated face mask use as the primary variable and the other variables from Table 1 as outcome variables. An unadjusted binary logistic regression was used to evaluate the association between face mask use and occupation. A stepwise selection procedure was performed with face mask use as the dependent variable and subsequently adding the independent variables age, sex, fmprotect, easyinfo, infohelp, afriresist. The Hosmer and Lemeshow Goodness-of-Fit Test were used to determine the best model fit [26]. The generalized regression formula can be specified as follows:

$$\text{logit} \left( \frac{p}{1-p} \right) = a + \sum_{i=1}^7 \beta_i X_i$$

Where  $p$  is the probability of using a face mask,  $a$  is the intercept of the model,  $\beta_i$  is the coefficient of the  $i^{\text{th}}$  independent variable and  $X_i$  is the  $i^{\text{th}}$  independent variable. The analysis was performed using the SAS version 3.8 edition, 2012-2018 SAS Institute inc., Cary, NC, USA.3.

### 3. RESULTS

A total of 1,525 participants responded to the survey. Among them, 837 were males, and 688 were females. 46.82% of the respondents were aged 15-25, 30.10% were aged 26-35, 13.18% aged 36-45, 5.97% aged 46-55, 2.82% aged 56-65 and 1.11% aged 66+. These proportions are similar to the age distribution in Cameroon's general population [27]. 409(26.82%) of respondents that are college students reported using a face mask as a protection measure against COVID-19, 95(6.23) reported the same among people with fixed incomes, 184(12.07) among high school students, and 604(39.61) among self-employed. A total of 233(15.28) respondents in all categories did not use face masks as protection against COVID-19, while a total of 1282(84.72) respondents reported using face masks as protection strategy against COVID-19 (Table 2).

**Table 2. Descriptive statistics (n=1,525)**

Sex	Face masks use	
	No (%)	Yes (%)
Male	121 (7.93)	716 (46.95)
Female	112 (7.34)	576 (37.77)
Age	Face masks use	
	No (%)	Yes (%)
15-25	126 (8.26)	588 (38.56)
26-35	62 (4.07)	397 (26.03)
36-45	25 (1.64)	176 (11.54)
46-55	10 (0.66)	81 (5.31)
Occupation	Face masks use	
	No (%)	Yes (%)
College	97 (6.36)	409 (26.82)
High school	44 (2.89)	184 (12.07)
Employee	15 (0.98)	95 (6.23)
Self-employed	77 (5.05)	604 (39.61)
Does physician's guidance and information help protect against COVID-19?	Face masks use	
	No (%)	Yes (%)
No	99 (6.49)	134 (8.79)
Yes	276 (18.10)	1016 (66.62)
Are Africans naturally resistant to COVID-19?	Face masks use	
	No (%)	Yes (%)
No	44 (2.89)	134 (8.79)
Yes	276 (18.10)	1127 (73.90)
Do you believe using face masks protects against COVID-19?	Face masks use	
	No (%)	Yes (%)
No	194 (12.72)	39 (2.56)
Yes	407 (26.69)	885 (58.03)
Is it easy to access physician's guidance and information about COVID-19 on social media?	Face masks use	
	No (%)	Yes (%)
No	104 (6.82)	129 (8.46)
Yes	313 (20.52)	979 (64.20)

Among respondents that use face masks, 276(18.10) thought that the guidance and health information shared by physicians did not help them prevent COVID-19, and 1016(66.62) thought the guidance and health information from physicians did help. 313(20.52) respondents using

face masks reported that they do not have easy access to health information and guidance shared by physician on social media and 979(64.20) who use face masks reported that they have an easy access to the guidance and information shared by physicians on social media. Among the same category of face mask users, 407(26.69) did not believe face masks offer protection against COVID-19, while 885(58.03) respondents believed that face masks protect. 165(10.82) did not think that Africans have a natural resistance to COVID-19, while 1127(73.90) did find that Africans have a natural strength to COVID-19 (Table 2).

A positive association was observed between college students and wearing face masks (OR=1.85, 95%CI: 1.34-2.57) as well as high school students and wearing face masks (OR=1.93, 95%CI: 1.29-2.90) (Table 3) though the difference between education (high school and college), employee and self-employed is not particularly meaningful. After adjusting for infohelp, afriresist, fmprotect, and easyinfo, no occupation category was significantly associated with face masks use (Table 4). Guidance and information provided by physicians on social media were positively associated with face masks use (OR=2.06, 95%CI:1.48-2.85). The belief that face masks protect against COVID-19 was also positively associated with face masks use (OR=10.48, 95%CI: 7.20-15.25), same with the ability to easily access guidance and information provided by physicians about COVID-19 on social media (OR=2.70, 95%CI: 1.94-3.75). The belief that Africans are naturally resistant to COVID-19 was also associated with face masks use (OR=1.73, 95%CI: 1.13-2.65) (Table 4).

**Table 3. Unadjusted model**

	OR	95% CI	P-value
Self-employed			
College	1.85	(1.34-2.57)	0.04
Employee	1.23	(0.68-2.24)	0.25
Highschool	1.93	(1.29-2.90)	0.05

### 4. DISCUSSION

To our knowledge, this is the first attempt to assess the association between face masks use and occupation in Cameroon in the context of COVID-19. This study found that face masks use in Cameroon is not significantly associated with occupation, which confirms our original hypothesis. On April 13, 2020, Cameroon's government made the use of face masks in public an obligation, although the Cameroon ministry of public health still maintains that people without COVID-19 symptoms do not need to wear face masks [28]. Enforcement of the government's order might partly explain the adoption of the new behavior regardless of occupation. The positive association between face masks use and the guidance and information provided by physicians about COVID-19 on social media (OR=2.06, 95%CI:1.48-2.85), indicates that physicians and health professionals have been creative in

reaching out to the public. In recent years, WhatsApp, Facebook, and YouTube, have been key in shaping the ways physicians and health professionals process and disseminate health information to the public, including in Cameroon [29-33].

**Table 4. Adjusted model**

	OR	95% CI	P-value
<b>Self-employed</b>			
<b>College</b>	1.91	(1.33-2.76)	0.11
<b>Employee</b>	1.56	(0.80-3.02)	0.97
<b>Highschool</b>	1.92	(1.21-3.03)	0.20
<b>infohelp</b>	2.06	(1.48-2.85)	0.0001
<b>afriresist</b>	1.73	(1.13-2.65)	0.01
<b>fmprotect</b>	10.48	(7.20-15.25)	0.0001
<b>easyinfo</b>	2.70	(1.94-3.75)	0.0001

There are divergent views regarding the efficacy of face masks and recommendations from international bodies and countries [34-37]. Some recent studies have indicated that face masks use by the general public is vital in preventing influenza, coronaviruses and COVID-19 [38-41]. In the context of COVID-19, a right proportion of our respondents that use face masks reported that they quickly access guidance and information provided by physicians about COVID-19 on social media (979 respondents (64.20)) and find the guidance to be helpful (1,016 respondents (66.62)). This suggests that physicians and health professionals have been instrumental in informing the public and shaping the discussion around COVID-19 in Cameroon. (1,016 respondents (89.29)), in this study, reported that they believed Africans are naturally resistant to COVID-19. These persons might mean they do not think Africans can quickly get infected or that Africans will not easily die from COVID-19 if they are infected. This scenario indicates that the perceived susceptibility to COVID-19 among Cameroon's general public is shallow. The belief that Africans are naturally resistant to COVID-19 was positively associated with face masks use OR=1.73(1.13-2.65) in this study. This counterintuitive association might be due to factors that need more investigation.

#### 4.1. RECOMMENDATIONS

Health professionals need to improve the quality of information they disseminate. With the help of government, health professionals need to increase Cameroonians' awareness about the danger posed by the pandemic. Health professionals need to provide the public with science-driven and quality information as a way of raising their perceived susceptibility to COVID-19. It is crucial that the government of Cameroon – through the ministry of public health – directs more resources towards programs to help health professionals address the COVID-19 pandemic on print and social media. This might help tackle fake news and increase people awareness about the pandemic.

This study presents some limitations. Given the fact that the interviewers recorded answers from respondents, misclassification might have occurred. The analysis does not evaluate the behaviour (wearing of a mask) prospectively hence the effect cannot be measured over time. This study cannot be a basis to determine a cause-effect relationship between face masks use and the other variables. Future studies might need to include other specific professions in evaluating the relationship between face masks wearing and occupation.

## 5. CONCLUSIONS

Wearing a face mask in the context of COVID-19 is not associated with occupation in Cameroon which is consistent with our hypothesis. A detailed analysis of specific types of professions might be needed. Health professionals are making a difference in informing and educating the general public, primarily through social media, but more needs to be done in terms of quality. The low perceived susceptibility of Cameroon's general public vis-a-vis COVID-19 is worrying. As health educators, health professionals may need to focus on raising awareness among Cameroonians across the board.

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