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Yaovi TOSSOU (✉ [tossouyaovi@yahoo.fr](mailto:tossouyaovi@yahoo.fr))

University of Lomé

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## Research Article

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# **Effect of COVID-19 on the risk of household demand for health care in Togo**

**Corresponding authors name, address, country, e-mail address, ORCID details:**

**Presented by:**

**TOSSOU Yaovi**

*Doctorate in economics (PhD)  
Assistant -Researcher*

*Member of the Research in Economic Analysis of Public Policies (ANEPP) (FASEG/University of Lomé)*

*E-mail: [tossouyaovi@yahoo.fr](mailto:tossouyaovi@yahoo.fr)*

**Address:** *01BP1515 Lomé-Togo*

*Phone: 00228 91 27 94 84*

*[ORCID identifier is 0000-0002-9244-9387](https://orcid.org/0000-0002-9244-9387)*

## **Abstract**

**Background:** Barriers on the demand side of the health care system are as important as supply side factors in deterring patients from obtaining effective treatment during COVID-19. Developing countries, including Togo, have focused on reducing the risk of health care use during this period by ensuring basic health care services, as an important policy to improve health outcomes and meet international obligations to make health services accessible.

**Methods:** The data used come from a national household survey conducted from 8 to 17 July 2020 covering all 44 districts of Togo's 6 health regions. In each district capital, a minimum of 30 households were included by a systematic random draw at two levels (district then household). On the basis of these data, the multinomial regression model is used to identify the risk factors for the demand for health care services during COVID-19.

**Results:** A total of 1946 (with a response rate of 98.3%) participants were included in the study. The conclusion on households over 60 years of age indicates that the relative risk ratio (RRR=23.97; 95% CI = 0.93; 615.38) allows households to practice self-medication instead of modern care structures. The multinomial model revealed that the relative risk ratio of activities before COVID-19 (RRR=4.879; 95% CI=1.018; 23.38) allows households to maintain their choice of self-medication and (RRR=3.139; 95% CI=0.91; 0.829) to prefer public health centre. As an educated head of household (RRR=0.192; 95% CI = 0.017, 2.113) he prefers the choice of private health centre during COVID-19.

**Conclusions:** This study found that the majority (30.49%) of patients sought health care. The analysis shows that the loss of employment, pre-COVID-19 activities in households and regions not infected by the pandemic allow households to remain in the choice of health care demand (self-medication and public hospitals) despite the impacts of COVID-19. On the other hand, the level of higher education and age determine an alternative choice of health care provision by households. Therefore, policy makers need to put a particular emphasis on social policies to address household health shocks.

**Keywords:** COVID-19, Pandemics, health care, Multinomial logit model.

## **Background**

The COVID-19 pandemic is occurring in the context of a global economic crisis, which highlights the health challenges and socio-economic factors facing the most vulnerable people in our communities. The demand for health care is characterized by the level of an individual's actual consumption in the event of illness. This health care consumption differs according to factors of health care demand such as income, cost of care, education, social norms and traditions, and the quality and adequacy of the services provided [1; 2]. It is in a multidimensional perspective that an individual who makes a decision to go to a health facility in case of illness/injury with regard to health care. Developing countries have been promoting the use of health care as an important policy to improve and meet international obligations to make health services more accessible. However, many policy initiatives focus on research to improve physical access rather than the pattern of use of health care services.

Thus, in the face of the multiple measures related to COVID-19, the demand for health care is likely to be reduced. This could have devastating consequences on the health status of the population. These reductions can result from a range of factors on the supply and demand sides. With this pandemic, most health personnel are being reassigned to respond to COVID-19 emergencies, resulting in a shortfall in the health care provider to meet the population's demand for care. Similarly, health facilities may be closed or have limited hours, and disruptions in the supply chain may limit the availability of needed health products. And as demand factors, the implementation of social distancing policies and orders to stay at home limit the movement of the population. This allows households not to choose health facilities because of fears of COVID-19 and financial constraints that limit their ability to pay for care. Thus, [2] indicates that the consequences of social distancing measures and employment restrictions have had a much greater impact on several sectors in terms of health care demand. According to [4, 5], the COVID-19 pandemic had impacts on income flows in the economy through reduced hours of work or closure. This has led to a variation in household incomes that is not conducive to a demand for health care during the pandemic.

However, the socio-economic status of households is one of the determining factors in the choice of health care services in the event of illness. It is affected by factors in terms of demand and supply of health care. In terms of demand, many results show differences in the demand for care by households. These socio-economic factors are often assessed according to income, occupation, level of education, health insurance coverage, age, place of residence, etc. These socio-economic factors are often assessed according to the level of income, occupation, level

of education, health insurance coverage, age, place of residence, etc. Some results show that disadvantaged socio-economic backgrounds are more likely to be non-users of health care by households during the COVID-19 pandemic. Several studies have shown that economic variables such as household income and price influence health care decision-making, [6; 7] revealing that price, income, and the distance between health centre and the home are important determinants in the choice of households to use health care services. In addition, [8; 9; 10, 11] have highlighted the importance of quality of care in promoting choice of health care services. More specifically, [12, 13, 14] classified the factors influencing the demand for health care services into three categories: predisposing factors (social characteristics), enabling factors (access to health care), and care needs (characteristics of perceived illness).

Furthermore, in the context of COVID-19, [15], find that the effect of physical remoteness measures, particularly among people with chronic diseases, distracts them from using health care services. In addition, [15] expressed concerns about access to health care. They find that non-use of health care increases the risk of illness or death in households, not only because of COVID-19 but also because of other health-related problems. In addition, they may exacerbate problems such as asthma, access to medication and wider access to care, [16] find that containment procedures are a barrier to health care use because many fear hospitalization. [17], shows that gender is one of the determinants of health care use during COVID-19. Hence the importance of adopting a health equity perspective to address the health inequalities that men face during pandemics.

On the other hand, the supply side approach to health care is characterized by the availability and characteristics of health services which influence demand for health care, in other words, the non-existence of the supply of care and its inadequacy determine the demand for care by households during COVID-19. As assumed by classical economics, supply therefore creates its own demand. The choice of households to seek care depends primarily on the efficiency and quality of health care providers, waiting times, and the cost of services.

The COVID-19 pandemic threatens to disrupt essential health services due to supply and demand barriers, As a result, child and maternal mortality could increase over the next 12 months, Maintaining essential health services during the COVID-19 pandemic is crucial to prevent adverse consequences and protect the progress made in recent years in reducing mortality. The COVID-19 pandemic results in mortality and morbidity directly attributable to it. It also poses a significant risk to other preventable and treatable diseases if the delivery of essential health services is disrupted.

Since the start of COVID-19 in Togo, policy makers and health care providers have been concerned about the drop in hospital attendance in the majority of cases. Initially, this sharp decline may have been attributed to the deprogramming of non-urgent care, which the majority of households suffer from all the time. Then, the confinement, coupled with the fear of contamination in public hospitals, may have dissuaded many people from not coming forward in case of illness. Not to mention the care and overburdening of health care providers who mobilised in large numbers for the sole cause of COVID-19. The consequences of such a situation could be dramatic in terms of public health.

Such a disruption could be caused by both supply and demand factors. In Togo, on the supply side, staff providing essential health services are mostly redirected to other health facilities to meet the requirements of COVID-19, and many health workers could become ill or die. Finally, global supply chains for supplies and equipment may be disrupted due to the shift in production to COVID-19-related supplies. All of these lead to decreases in the production of raw materials and significant delays in delivery times due to transport and movement restrictions decreed by policy makers. In Togo, during the pandemic, many vaccination programme for children and pregnant women were suspended, with repercussions on household health status. In addition, households have difficulty in going to health centre in case of illness for fear of being infected. This mistrust among households increases the morbidity rate in the face of difficulties in accessing the various health services. In addition, the rate of accessibility in Togo in health structures is very high in public health centre followed by private health services despite a good number of households that do self-medication/traditional care. With this pandemic, most households with no financial means and out of fear of going to public health centre that house people with COVID-19 prefer self-medication. All this is due to direct and indirect costs related to the demand for care in private health centre. Hence the low demand in both public and private health facilities. The scale of COVID-19, limits the care of patients suffering from non-communicable diseases by health care providers in health services. This raises a serious public health problem, as there is no reason why health problems should have decreased to the extent of the withdrawal of care observed during this pandemic. The main risk for households is that their health status will deteriorate. However, an increase in late hospitalization among patients is noted as a risk to their health status and excess mortality due to postponements of care and consultations with health personnel.

Faced with these problems of household health status, they seek low-cost health care and health centre that do not house COVID-19 patient. Since, empirically, certain socio-economic factors

are correlated with household demand for care, they are forced to make a choice among health care providers. With regard to the ownership of health care facilities, available data show a major use of health care by both the public and private sectors. For example, the use of health care has diversified in Togo during this pandemic, as some individuals have opted for public sector health facilities, others have chosen private health facilities, while a significant proportion of households have opted for self-medication. From all of the above, there is a need to find some answers to the problems raised, hence the following research question: What is the choice of health care providers made by households in the use of health care during COVID-19?

The general objective of this study is to analyze the effect of COVID-19 on the socio-economic factors that determine the choice of health care providers. Specifically, it aims to:

Identify socio-economic factors of health care demand during COVID-19.

-• Analyze the effect of COVID-19 on the choice of health care providers during COVID-19.

The results can contribute to a better understanding of this pandemic and trigger actions to reduce the mortality rate not due to COVID-19 in Togo. In light of the above, this study examined the factors that determine the choice of health care provider during COVID-19. The outline of this paper is structured as follows: First we will present a methodological approach, followed by the data used. Then the descriptive analysis of the variables, the results obtained and the discussion of the results. Finally a conclusion and policy implications.

## **Methods**

### **Theoretical framework**

In order to understand the motivations of households to use health care services during the COVID-19 pandemic, several methodological approaches were used. Based on two traditional neoclassical theories of household behavior and the principle of optimization to explain the demand for health care [18; 19; 20]. This demand for health care enables households to maximize utility and well-being. This allows households to choose whether or not to seek health care services during this period. The neoclassical economic theory of the rational consumer and the limited maximization of utility is the cornerstone of modern health care demand analysis. In this paradigm it is assumed that individuals derive their direct utility from health care services. The model is based on the idea that an individual chooses the outcome that maximizes the utility of their choice [20].

This article uses a modified version of the model in [21] in which an individual's utility maximizing behavior is embedded in health. The form of the utility function of the Rosenzweig-Schultz model for a period is:

$$U = U(X, Y, H) \quad (1)$$

Where, X is a good that produces the utility U of an individual but does not have a direct effect on his or her reproductive health status; Y is a good that is related to the utility of an individual and also affects health; H is the health status of an individual, This model is developed to explain the factors that go into determining the use of health care services, From this model, it appears that there is an influence between individual factors and health system factors.

### **Model specification:**

In this paper, we assume a heterogeneous group of households, which is a decision due to mistrust of the health care structures, especially the public health centre that house patients with COVID-19, This choice is made based on quantitative choice models, In this paper, we assume a heterogeneous group of households  $N$  which consists of  $n$  household types or patient groups. Let A be the patient group which is structured as follows: ... ..  $i = 1, 2, 3, \dots, n$ ,

We assume that during this period of COVID-19, in the event of illness, a household would seek help from a health care provider in a health care facility characterized by many providers. The household is assumed to choose medical care from four types of health care providers from a set E, defined by  $j = 1, 2, 3$  with:

✓  $E_1$  Self-treatment (including traditional medical treatment);

✓  $E_2$  : Public hospitals

✓  $E_3$  : Private hospitals (including mission hospitals)

The probability that a particular alternative will be chosen is equal to the probability that this choice gives the greatest utility among all the alternatives. Thus, the maximum expected utility of each treatment option for households is conditioned by the characteristics of the health care services associated with each treatment option  $E_1, E_2, E_3$ . and the socio-economic characteristics of the household or the patient who has made the choice in one of the health care structures.



A health care provider is characterized by a system V set of health services and access variables, with  $V = (v_1, \dots, v_d)$ . For a patient, the usefulness of going to a health care facility requires a choice among health care providers during this pandemic. The benefits of each health care provider are determined by the interaction between the characteristics of the health care provider and those perceived by the patient.

The presentation of household characteristics is described as follows:

X denotes the individual characteristics of households with  $X = (x_1, x_2, x_3 \dots \dots \dots x_q)$ ;

Y presents the characteristics of the health status of households that at these times of the COVID-19 pandemic have a real need to be seen or not to be seen in a health care facility, with  $Y = (y_1, y_2, y_3 \dots \dots \dots y_r)$ ;

Individuals within the household need a defined utility function within the framework of health care providers, which is conditioned by socio-economic factors that determine health care use with a health care provider. This choice of health care provider enables the household to maximize utility through the quality of health care. Thus, we have:  $U_j(X_i, Y_i, V_i) = \max(u_{i1}, u_{i2}, u_{i3}, u_{i4})$  (2)

Where  $u_{ij} = \alpha_j X_i + \beta_j Y_i + \varphi_j V_j$

The parameters  $\alpha_j, \beta_j$ , and  $\varphi_j$  are vectors of the main variables  $X_i, Y_i$ , and  $V_i$

From equation 2, the first two parameters are individual characteristics and the last one specifies the choice of health care provider. In the model logit an increase in the variable  $X_i$  of an individual i, will change the utility of each household when choosing a care provider j, On the other hand, an increase in the variable  $V_j$  in the use of health care j, will change the utility of household i when the choice of care provider is made.

These parameters are estimated by applying logit and multinomial model estimation techniques. Thus, equation 2 is written as:

$$U_{ij} = \alpha_j X_i + \beta_j Y_i + \varphi_j V_j + \varepsilon_{ij} \quad (3)$$

A household will choose provider  $j = m$  if and only if it offers the highest level of utility among all available choices. Thus, if  $F_i$  is a random variable whose value ( $j=1, 2, 3, 4, 5$ ) indicates the choice of provider made by households i, the probability that person i will choose alternative m is:

$$P_r(F_i = m) = P_r(U_{im} < U_{ij}) \text{ with } j = 1,2,3 \text{ or } j \neq m \quad (4)$$

$$\text{So } P_r(U_{im} + \varepsilon_{im} > u_{ij} + \varepsilon_{ij}) \text{ and } P_r(\widetilde{\varepsilon}_{ij} - \varepsilon_{im} < u_{im} + u_{ij})$$

for  $j = 1, 2, 3$ , with  $j \neq m$ , McFadden [27] has shown that if the three error terms  $\varepsilon_{ij}$  are independent and identically distributed, then with Weibull the distribution becomes  $F(\varepsilon_{ij}) = \exp[\exp(-\varepsilon_{ij})]$ ,

$$\text{then } P_r(F_i = m) = \frac{\exp(U_{im})}{\sum_{j=1}^3 \exp(U_{ij})} \quad (5)$$

The most widely used qualitative choice model is logit and since the patient's alternative choices are more than two, a multinomial logit model was adopted for this paper, Each of the N observations on the dependent variable  $F_i$  ( $i=1, \dots, n$ ) is treated as a single draw of a multinomial distribution with three outcomes, Defining a dummy variable  $\delta_{ij} = 1$  if household  $i$  has made choice  $j$  and  $\delta_{ij} = 0$  otherwise,  $j = 1, \dots, 3$ , The likelihood function is then :  $\text{Log}L = \sum_{i=1}^m \sum_{j=i}^3 \delta_{ij} \text{Pr}(F_i = j)$  (6)

Based on the application of the multinomial logit model, the probability that a household will go to hospital and choose a health care staff relative to the self-medication or traditional option can be expressed as follows:

$$\ln(P_r(E_2)/P_r(E_1)) = \widehat{\theta}_2 + \widehat{\alpha}_2 X_i + \widehat{\beta}_2 Y_i + \widehat{\varphi}_i V_2 \quad (7)$$

$$\ln(P_r(E_3)/P_r(E_2)) = \widehat{\theta}_3 + \widehat{\alpha}_3 X_i + \widehat{\beta}_3 Y_i + \widehat{\varphi}_i V_5 \quad (8)$$

$$\ln(P_r(E_3)/P_r(E_1)) = \widehat{\theta}_5 + \widehat{\alpha}_5 X_i + \widehat{\beta}_5 Y_i + \widehat{\varphi}_i V_5 \quad (9)$$

The variables X, Y and V are specified as follows : X is household characteristics (is a vector of individual characteristics such as age, severity of illness, education, gender, religion, etc.), Y is a characteristic of disease perception (is a random variable, which represents unobserved individual characteristics such as severity and complexity of illness that may affect the marginality of providers' productivity relative to self-care); V is a characteristic of health services (is a vector of the characteristics of  $j$  in relation to individual  $i$ , these included proximity to health centre, probability of being seen by a doctor, quality of service etc.).

In this study, the multinomial logit model is used because we have assumed that the alternative options provide choices, have different attributes and can be considered mutually exclusive.

This is consistent with almost all studies that focus on provider choice, they use the multinomial logit method.

### **Data source**

Empirical studies on the demand for health care are based on household data. This survey provides data to optimize the response measures against the spread of COVID-19 implemented by the Togolese state. This data collection on the prospects for the response to the COVID-19 pandemic in Togo is descriptive and analytical and is conducted on the acceptability, feasibility and practicability of measures to combat the spread of COVID-19 in Togo. The target population is the Togolese population living in urban areas. The target population is the Togolese population living in urban areas. The households surveyed are made up of all the people living in the chief towns of the health districts. The selection of households is exhaustive and is carried out among the populations of the forty-four (44) districts of the six (6) health regions of Togo. This will ensure comparability between the health regions. The analysis of these provide useful information on health care demand per household during this COVID-19 pandemic. All of these will help to understand the implications of health care use during the COVID-19 pandemic.

### **Analysis of variable descriptions:**

#### **The dependent variable:**

It is the choice of health care providers. Alternative health care providers are: health care providers in public health centre, health care providers in private health centre and self-medication or doing it on the household do not carry out consultations in modern health care centre. The selection of the health care provider during this period of the COVID-19 is done in three steps, namely

- ✓ 1 = if no modern health care provider has been consulted by the household or self-treatment,
- ✓ 2 = if the household was consulted by a public health care provider
- ✓ 3 = if the household was consulted by a private health care provider.

#### **Lists of independent variables used**

The independent variables include household socio-economic factors and are shown in the table 1.

**Analysis of the characteristics of health care use due to COVID-19,**

The results of the surveys reveal that of the 30.49% of households that were consulted sick during COVID-19, 61.41% of households practiced self-medication, 21.20% used private health centre against a small proportion of 17.39% who used public health care structures. This low proportion of the use of public health centre can be explained by the fact that COVID-19 patients are housed in these health centre. Hence the high risk for households to make use of them.

Table 1 presents descriptive statistics of variables related to the risks of household demand for health care during COVID-19. Analysis of the table reveals that approximately 56.3% of the households surveyed were women who took the risk of seeking health care compared to 43.6% of men. Of these households, 19.3% have no education, 23.2% have a primary school education and 12.2% of these households that have reached the higher level have used health care. On the other hand, the majority of surveyed households with a secondary level (45.3%) were able to use health care during COVID-19,

About 97.44% of respondents who did not receive family benefits claimed to use health facilities during the pandemic, compared to 2.56% who received family providers used health care in Togo. This is in line with the general perception of the negative impacts of this health crisis of the COVID-19 crisis on the risk of household demand for health care. In addition, the statistics highlight the behavior of households with regard to the demand for health care following the loss of their jobs during this pandemic. For example, 18.18% of households that lost their jobs were able to use health care centre whose incomes were affected by the Covid-19 on the demand for health care. In addition, the remittance programme for the most vulnerable households was only accessible to a small proportion of beneficiaries. Of this proportion, 94.2% of the surveyed households receiving these cash transfers used health care when they were ill.

**Table 1: Descriptive analyses of variables according to health care use during COVID-19.**

**Choice of health care providers during COVID-19 by level of education**

The analyses in this table 2 show that most households reduce the risk of becoming contaminated in public health facilities by opting for self-medication as the level of education increases. So this frequency table below shows that more than half of the 26 (72.22%)

households with no education level prefer self-medication during the COVID-19 pandemic, while this proportion is 5 (13.89%) for both public and private health care providers. This low proportion is explained by the fact that public health facilities are sheltered by patients with COVID-19. Nevertheless, 27 (54%) of primary level patients opt for self-medication compared to 13 (26%) in private health centre and 10 (20%) in public health centre. In addition, with a higher level of education the proportion is high 19 (65.52%) for self-medication, 4 (13.79%) prefer private health centre and 6 (20.69%) use public health providers. This high proportion of self-medication may be due to the loss of employment of households during the COVID-19 pandemic and the risk that these individuals may be contaminated.

## **Table 2: Choice of health care providers during COVID-19 by education**

### **Choice of health care providers during COVID-19 according to certain social protection characteristics.**

In Table 3, households were allocated according to the risk of choice of health care providers during COVID-19 via certain variables such as loss of income, health insurance and family benefit. The results survey reveals that households with employment accounting for 81 (65.85%) have a higher proportion of self-medication per risk of being contaminated by COVID-19. On the other hand, in the same situation, 21 (17.07%) of employed households have a preference for using public and private health centre in the event of illness. In addition, the analysis shows that households with social protection such as health insurance and family benefits have a high proportion of self-medication. This proportion is respectively 17 (54.84%) for health insurance and 2 (50.00%) for health care providers. On the other hand, on behalf of the health insurance, 3 (54.84%) of households with insurance choose private health centre compared with 11 (35.48%) for public centre. With regard to the choice of health care providers, households' preferences seem to shift from self-medication in public to private health care facilities in terms of the level of employment, health insurance and social benefits.

**Table 3: Choice of health care providers during COVID-19 according to social protection characteristics.**

**Results :**

The Multinomial logit model (table 4) is used to estimate the risk of choice of care providers when the household wants to seek care or not during this COVID-19 pandemic.<sup>19</sup> The Multinomial logit model is used to estimate the risk of choice of care providers when the household wants to seek care or not. The variables used are derived from work [12, 13, 14] which classified socio-economic factors that influence the demand for health care services into three categories: predisposing factors, enabling factors, and severity of illness, The results are presented in Table 4.

Relative risk ratios (RRR) determined from multinomial logit regression indicate the risk that individuals face when choosing a survival strategy relative to the choice of the reference modality. The aim is therefore to compare relative risk ratios of, for example, using one type of care rather than another. Thus, the household is considered to remain in its strategy if  $RRR > 1$  and to choose the reference modality if  $RRR < 1$ . Thus, the statistical significance of the coefficients of certain explanatory variables enables us to identify the variables which explain the choice of households to use a given care structure compared to the reference health structure (public hospital). Generally speaking, the results indicate that households prefer private hospitals to public hospitals, since for many explanatory variables the relative risk ratio is less than 1.

Age is positively related to the demand for public health services and private sector hospitals. On the other hand, the coefficient of the relative risk ratio is significant and greater than 1. Age is also found to be a factor in explaining the choice of health care use by households during the pandemic. Indeed, compared to young households aged between 18-34, individuals aged 60 and over take the risk of remaining in their choice of self-medication in favor of private hospitals. This implies that as their age increases, they tend to self-medicate because they are limited by measures of the response to COVID-19 such as social distancing, inter-city travel, and mask purchase. This reduces health care costs if they agree to use the health centre. However, older people prefer modern health facilities because of their state of health. This continued self-medication by older people can be explained by the fact that specialized services

are housed in public hospitals. However, during this health crisis, public hospitals are overwhelmed by patients with COVID-19.

On the other hand, when referring to household size, the coefficient of the risk ratio is significant and less than 1, implying that the size of the household determines the choice made per household during COVID-19. It appears that the latter influences the risk taking of modern (private) care more than public care. The preference for those households with more than 6 children may be explained by the fact that these households are no longer able to control in case of illness, hence the use of modern health care.

In terms of the choice of health care providers, the educational level of households is also positively related to the demand for care. The coefficient of the education level variable is significant and the relative risk ratio is less than 1. This implies that during the COVID-19 pandemic, individuals with a high level of education prefer to use private health centre rather than self-medication or a public health centre, all of which removes them from the risk of contamination if they were to use these health centre. Indeed, it appears that the higher the level of education of individuals, the more they have a preference for private hospitals instead of self-medication and public hospitals. Also, households with a higher level of education tend to maintain their habit of using private health care during the pandemic period. In all cases, the relationships were significant at 1%. This implies that educated households tend to use private hospitals more than other health centre. This observed result is due to the perceived quality of care as well as the availability of specialized services provided by private hospitals. Finally, during this COVID-19, it is observed that the choice of private health centre was influenced by the level of education of the households, but it influences the choice of a private facility.

Regarding the perception of the effects of the response measures at the household level, the results reveal that households that experienced a moderate and severe effect from Covid-19 preferred an alternative to using a private health centre rather than self-medicating or using public health facilities. This is because the coefficient of moderate and severe effects is significant and less than 1. All in all, the impact of Covid-19 affected the choice of health care providers when households fell ill during COVID-19. Therefore these households are at high risk of using public hospitals, which in most cases house public health centre.

Furthermore, the coefficient of the relative risk ratio of household activities before COVID-19 is significant and greater than 1 in the choice of health care provision such as self-medication

and household use of public health care. Those households that lost their jobs to remain in the choice of food consumption rather than eating as usual.

The results also indicate that individuals residing in the Plateaux, Centrale and Kara region prefer to choose self-medication. On the other hand, households living in the Central, Kara and Savane region remain in their choice of using public health centre compared to the Maritime or Lomé Commune region, where the relative risk ratio coefficients are greater than 1, as these households did not want to change their choice of health care provision during the pandemic. These results can be explained by the fact that these regions are not infected by COVID-19 so that policy makers can implement response measures in these regions such as distancing, intra-urban movement.

**Table 4: Analysis of the choice of health care provider during COVID-19.**

**Discussion**

The results of this study show that 61.70% of households used self-medication, 20.74% in private health centre and 17.55% in public health centre during the pandemic. This result shows the low demand for modern health services among the households surveyed, especially the public health facilities that house patients with COVID-19 or households fearing the risk of contamination, hence the low use of health care. This implies, however, that a significant number of households do not benefit from health care services, and they prefer self-medication for fear of being infected with COVID-19. The low demand for care observed by households may be due to community health or other prepayment schemes.

Multinomial logit regression analysis revealed that households with a higher level of education increase the likelihood of choosing a modern health care facility than households with no education. This is explained by the fact that educated people have better information about modern health care facilities. In order to respect the barrier measures and the social distancing required during this period, the behavior and attitudes adopted by households towards COVID-19 had economic impacts on the demand for health care. For these households experienced economic shocks on their living conditions. This health crisis and its corollaries affect the loss of employment of households, making it difficult for them to seek care in case of illness. Household job losses that have an impact on the use of health care are due to curfews and the cessation of business and administrative activities. Currently, prohibitions and limitations imposed to combat COVID-19 affect the choice of health care providers. Specifically, the results show that 15.4% of households face problems in accessing health facilities and these



households are obliged to purchase alcohol gels and face masks as protective measures. Furthermore, the pandemic has already had a catastrophic impact on the most vulnerable households. In addition, the pandemic has already had a catastrophic impact on the most vulnerable households. These households have a deteriorating health status in the event of illness and are exposed to higher health risks. As a result, they face a greater limitation in access to basic health care.

With regard to the substitution of COVID-19 control products, there is an increase in user fees in private health facilities due to mistrust in public health centre. All this reduces the likelihood of using health care at the modern health care provider compared to self-treatment. This could be explained by the fact that the risk of health care demand is affected by the impact of COVID-19 on household income-generating activities, job loss and household education levels. For example, the United Nations (UN, 2020) estimates that the reduction/loss of household income due to COVID-19 and the reduction in essential health expenditures could wipe out the progress in mortality reduction over the past three years. In Togo, the most cited effect of the pandemic is the reduction or closure of commercial activities due to restrictions by policy makers. Similar effects of the pandemic on sources of income were reported by households. For example, the total loss of jobs as the economic consequences of the pandemic was reported by households, with 14.16 per cent losing their jobs during the COVID-19 pandemic. The most cited effect of the pandemic was the reduction or closure of business activities due to restrictions by policy makers. These disruptions to income-generating activities induced by COVID-19 have been observed in several reports and studies [22]. All of these have pronounced effects on the demand for health care.

**Conclusions:**

The use of basic health services during COVID-19 is one of the key factors promoting better health of populations. The literature indicates that analysis of the determinants of health care demand is extremely important for the formulation of policies and strategies in the health sector but also for ensuring effective use of health care services. This study analyses the effect of COVID-19 on the risk of health care demand among households in Togo. The results show a deterioration in household demand for health care during the COVID-19 pandemic. In addition, socio-economic characteristics such as loss of employment, level of education, place of residence, health insurance and social protection are important factors in the risk of household demand for health care during this COVID-19 pandemic in modern health care settings.

Based on the findings, this paper suggests the following strategies to help stabilize the proportion of household health care accessibility during the COVID-19 pandemic: First, policy makers need to implement structural changes in social protection mechanisms to facilitate access to care for households regardless of the choice of health care provider. Second, there is a need to broaden the coverage of health insurance and family benefits, especially for low-income people and households working in the informal sectors. A better understanding of the determinants of health care demand makes it possible to introduce and implement appropriate incentive systems. All this helps to encourage better use of health care services during pandemics.

## **The Declarations sub-sections:**

### **Ethics approval and consent to participate**

Ethical approval was obtained from the “Comité de Bioéthique de Recherche en Santé” (Bioethics Committee for Health Research) from the Togo Ministry of Health (No. 004/2020/CBRS). Potential participants were informed about the study purpose and procedures, potential risks and protections. Those willing to participate were invited to sign a consent form prior to participation. The African Centre for Research in Epidemiology and Public Health, provided ethical clearance for household surveys. All participants in surveys provided informed, signed consent. In every household, the interviewer explained the purpose of the questionnaire and study and asked whether the respondent was interested in hearing more and, may be, in participating. If the respondent agreed to participate in the survey, the interviewer collected his written informed consent. A copy of the informed consent is kept for the integrity of the research. The information collected in the survey was solely used for research purposes and never have the name and residence of the respondents been disclosed to a third person.

The written consent of respondents is sought and obtained if they are over 18 years of age. For minors between the ages of 10 and 17, written consent from parents or legal representatives is sought and obtained in addition to the subject's assent prior to the administration of any questionnaire.

### **Please provide a statement to confirm that all methods were carried out in accordance with relevant guidelines and regulations:**

I confirm with this note that all the information and methods given have been applied in accordance with the directives and regulations or All protocols are carried out in accordance with relevant guidelines and regulations.'

### **Retrospective ethical approval**

This study was approved by the ethics committee before the study began. In addition, the protocol and amendments are submitted to the Bioethics Committee for Health Research (CBRS) for its opinion on the conduct of the study. The ethics committee can thus carry out field visits to check whether the ethical rules of the study are respected

### **Consent for publication**

Not required.

### **Availability of data and material**

The datasets used and/or analyzed in this study are available from the Bioethics Committee for Health Research (CBRS) from the Togo Ministry of Health (CBRS No004/2020/CBRS) upon reasonable request. Data to support the findings in this article are available from CBRS and may be obtained with written permission. These sites allow you to contact the CBRS to make a request for available databases. In addition, for the declaration of data availability, you can contact the Professor Didier Koumavi EKOUEVI or Bioethics Committee for Health Research (CBRS) to obtain data and materials.

### **Competing interests**

The author declares that he/she has no competing interests.

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### **Authors' contributions**

Y.T: designing and planning of study, data analysis, and manuscript preparation. The author read and approved the final manuscript.

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### **Authors' information**

I am the only author on this manuscript. Please find my information above

### **Abbreviations**

UNOPS: United Nations Office for Project Services

COVID-19: Coronavirus disease 2019

WHO: World Health Organization

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