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Evaluation of the impact of social safety net program on health care utilization in Togo

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Abstract

Background The use of health care services by the most vulnerable households in low-and middle-income countries is a major challenge. This includes ensuring access to health services and protecting households from the financial risks of unaffordable medical care. In 2008, Togo put in place a social safety net program which aims to help vulnerable households benefit from cash transfers, free health care services, donated bed nets and food supplements.

Methods The data come from recent national household surveys in Togo. These are the 2018 Harmonized Household Living Conditions Survey (EHCVM). The sample size of the EHCVM survey is 6171 households. Using propensity scores (PSM) and the endogenous switching regression (ESR) model, we find that basic social nets have little direct effect on health care utilization.

Results These results show that households that are beneficiaries of the social safety nets would have had less -80.52% (-0.413/0.5129) use of health care services than if they had not participated in the social safety nets. These results show the indirect effect of the mitigation of social safety nets by policy makers to avoid hunger, malnutrition, poverty, unemployment. All of these strengthen the health status of households by avoiding certain diseases that may lead them to use health care services.

Conclusion This paper provides new evidence on the impact of social safety net programs on household health care utilization. Given the voluntary nature of participation in social safety nets by households, we exploit the uneven deployment of the program in rural areas as a natural experiment to explore causal inference. However, they do ensure good health status of households through different transmission channels, which reduces health care utilization. Policy makers should be encouraged to expand this program to other non-beneficiary groups.

Keywords Social safety net, Health care utilization, Endogenous switching regression (ESR)

Introduction

Financial constraints are one of the main causes of health care utilization and impoverishment of the poor in developing countries [1]. Lack of financial protection prevents households from accessing necessary health care and exposes them to financial hardship following payment for health care [2]. The health of individuals has received much attention in all developing countries. Improving household health in low-income countries is a challenge because of nutrition problems and poor health care services. Improving population health and reducing mortality rates are among the Sustainable Development Goals (SDGs).

Social safety nets in developing countries are a set of multiple social assistance programs designed to support vulnerable populations. They are composed of numerous programs run by different government agencies that provide assistance according to the particular needs of the individual. Beegle et al. [3] The fact that these programs have become part of the development strategies of

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most of these countries shows that they are now a part of the development strategies of most of these countries. Many of the safety net programs target the health status of the population. The opportunity objective of social safety nets is the improve the access of poor people and people in a situation of food insecurity to cash transfer programs, food kits and health problems. Typically, the outcomes of interest associated with this objective are investments in education, nutrition, and health care, as well as increased household income.

In Togo, the improvement of the living conditions of vulnerable populations continues with the implementation of basic social nets. Among the basic health social safety net programs such as free household care programs, the use of impregnated mosquito net donations, food supplements for malnourished children are essential elements to help households improve their health status and avoid catastrophic health expenses. Despite improved access to basic health services in Togo, the country remains far from what is needed to achieve the Sustainable Development Goals (SDGs). The results of the 2015 health map show that healthcare is provided by the public (59%) and private (41%) sectors. These results have evolved in 2020, from 60% for the public sector and 40% for the private sector (Annual report, 2021). The private sector is liberal, dynamic and mainly concentrated in the major urban centers, mainly Lomé, where demand for healthcare is more solvent.

Market failures are generally cited as the main economic justification for this situation. In addition, the consumption of certain goods creates positive externalities that justify their subsidization, in order to maximize their use by the population. For this reason, the implementation of social safety net program generally aims to increase the demand for preventive health services such as free health care, the use of health care and the reduction of certain medical costs for vulnerable households, as these program generate positive spillover effects. All these elements also help households to overcome the various barriers to accessing social services. First, health care costs are often high for poor households, and it is these high costs that may cause them to delay seeking care when they are ill. Thus, the various social safety net programs can increase the use of health care and improve the health status of these households. Moreover, when a person suffers from negative health events such as chronic diseases, their medical expenses increased considerably [4]. To cover the costs of health care, poor households may reduce their consumption and investments, and sell some of their assets. There is evidence that even a short-term health event can push some households into long-term poverty [5]. Health insurance, which is a component of basic household social safety nets, reduces out-of-pocket expenditures, including catastrophic health expenditures [6, 7].

To address the mitigation of health expenditures and avoid mortality, the Togolese policy maker has implemented programs to increase the health care utilization of beneficiaries and ensure their health status. This requires that they receive free health care services, donations of impregnated mosquito nets and food supplements for malnourished children. In Togo, available data shows a total of 12 active social safety net programs in 2018, most of which adopt a categorical targeting approach. These social safety nets are mostly food programs, cash transfers and a life cycle for children and households.

Our paper contributes to the existing literature in several ways. First, we not only examine the impact of basic social safety nets on health care utilization, but we also explore more specifically the analysis of the decomposition of the impact of basic social nets according to household subgroup membership. This is important because these analyses allow us to see the real impact of these social nets according to the most vulnerable health care settings. Therefore, the results are instructive in terms of whether different social safety net programs help households to improve the quality of care that can lead to real gains in population health. Second, we use an endogenous switching regression estimation approach that solves the endogeneity problem of unobservable variables. Third, our estimates show that the introduction of basic social safety nets appears to reduce the likelihood that households will seek health care services while reducing the use of informal care (self-medication and traditional care). This is because these nets have helped to improve the health status of households through food supplements, mosquito net donations and disease prevention through vaccinations. This has reduced their use of health care. Further subgroup decomposition analyses suggest an increase in health care use by low-income households that did not benefit from these social safety nets. To some extent, social safety net programs make important and necessary changes to the current health care system, and improve the efficiency of the health care system by directing patients to basic health care facilities and helping them to obtain more convenient and less expensive health services.

Faced with these problems of child health status and in order to seek a better standard of living and low-cost health care for children, it is important to identify the transmission channels that influence these social safety net programs. Given that empirically, certain socio-economic factors are correlated with participation in a social safety net program, they are therefore bound to make a choice conditional on whether or not children participate

in social safety nets. From all the above, there is a need to find answers to the problems raised, hence the following research question: What is the impact of social safety nets on household health care utilization in Togo?

The general objective of this study is to analyze the impact of social safety nets on household health care utilization in Togo. Specifically, it aims to:

- Identify the determinants of demand for social safety nets on household health care utilization in Togo.
- To analyze the impact of basic social safety nets on household health care utilization in Togo.

The results can help improve children's vulnerability, have an effective health stock and trigger actions to reduce the infant mortality rate. In light of the above, this study examined the factors that determine participation in social safety net programs and its impact on household health care utilization in Togo. 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.

Literature review

Social safety nets are comprehensive systems of social protection designed to provide financial support and services to individuals and families experiencing economic hardships, aiming primarily to alleviate poverty and enhance economic stability. These systems include various programs such as cash transfers, food assistance, housing support, and social insurance schemes. According to [7], social safety nets are essential in preventing individuals from falling into extreme poverty by offering a financial cushion during times of economic distress or personal crises. In sub-Saharan Africa, cash transfer programs are distinguished by their focus on extremely poor and labor-constrained households (those unable to work, e.g. the elderly and severely disabled), as well as "soft" conditions, i.e. no sanctions for non-compliance and low levels of monitoring due to the costs associated with monitoring and enforcement [8]. An empirical study of twelve cases shows that social safety net policies are the result of complex interactions between groups of political actors (international and national), but these are not sufficiently documented [9]. Research on social protection in Sahelian West Sahelian West Africa has focused more on health coverage [10]. Very little research has been carried out on social safety nets, because they are very recent in this region [9].

The results of [11], in Côte d'Ivoire indicate that social safety nets have a positive impact on the socio-economic conditions of beneficiary populations. They enable households to make productive investments for their future, but also to invest in human capital through access to health, education and quality housing. However, these programs could have a negative impact on inclusion and solidarity if, for example, the beneficiary selection process were perceived as ill-defined and inequitable, or when poverty rates are high [12]. The beneficiary selection process must discourage stereotyping and resentment among non-recipients. Social nets can influence community perceptions, and these interventions can also lead to political mobilization by bringing the state closer to beneficiaries [13]. Della et al. [14] finds that poverty targeting has proved beneficial to communities, creating positive economic spin-offs even for non-beneficiaries. On the other hand, targeted programs can also reconfigure social relations, by conveying a social stigma that divides communities. Drawing on rich qualitative data from a cash transfer program in Chad, we explore the economic and social implications of targeting in cash transfer programs in contexts of widespread poverty. We find significant positive economic effects on non-recipients. Social protection gives households the ability to resist the temptation to resort to desperate solutions and to become less vulnerable in the future. In addition, the social safety nets that make up social health protection prevent households from becoming impoverished as a result of catastrophic health expenses, and therefore enable them to preserve their productive assets [15]. Social safety nets are non-contributory transfer programs targeted in one way or another at poor or vulnerable populations [16]. They aim to stimulate household consumption of essential commodities and services, either directly or through a substitution effect. The poor and vulnerable populations they target are groups of people unable to meet their own basic needs, or at risk of falling into poverty as a result of exogenous shocks or socio-economic problems such as age, illness or disability.

In Senegal, social safety nets, which are components of social assistance programs, and active labor market programs play an important role in improving labor productivity. An important role in improving labor productivity. When these programs focus on education (school scholarship programs or school feeding programs), they help to improve the future productivity of beneficiaries by increasing the number of years of education and performance [17]. According to [16], "social safety net systems are generally made up of several program that are woven together and that, ideally, complement each other and other public or social policies". Thus, the typology of social safety nets is made up of social safety nets in kind (food transfers, input transfers and non-food transfers, etc.); monetary (cash transfers, subsidies, etc.) and social

protection (health insurance, etc.). In a social protection system, health insurance, cash transfers, are the components that facilitate the use of healthcare services by households. By extending the scope of social safety nets to social protection, the work of [18] shows that the latter has a positive impact on reducing vulnerability and health status. According to [19], in order to reduce healthcare use more effectively, it is necessary to make extensive use of social safety nets in both the short and long term. Neves et al. [20], for example, concludes that, in the event of multiple crises, social transfers in cash or in kind can help to address social risks and reduce the economic vulnerability of households. Thus, we can say that in Ethiopia, the community health insurance program to improve the use of healthcare. Ramey (2020) discusses how unemployment insurance programs, for example, provide essential income support to displaced workers, helping to sustain spending and economic activity.

In this study, health insurance increased the use of healthcare. This is consistent with the results of the study conducted in Burkina Faso, in the district of Nuna, where the level of use of health services was lower than average where the level of use of health services was higher in the insured groups [21]. Community health insurance motivates participants to make greater use of community health services. Low-income households were less likely to use healthcare than higher-income households [22]. Previous studies have found a positive relationship between health insurance and healthcare utilization [22].

As a social protection program such as social safety nets and cash transfers, [23] argue that health insurance coverage does not affect the use of healthcare. Furthermore, they find that individuals reduce the use of health services because this health insurance program did not cover medicines and the perceived quality of services was very low. McKellar et al. [24] and Limwattananon [25] find negative effects of health insurance coverage (a component of social safety nets) on out-of-pocket spending and negative effects on infant mortality rates. This can be explained by the fact that, once covered, people become aware of their additional healthcare needs and protect themselves against possible illness, leading to a reduction in healthcare services. Thus, [26], have shown that micro health insurance has contributed to the financial protection of its beneficiaries, reducing catastrophic health expenditure and reducing the use of health care services. Anderson et al. [27] only conclude that not having insurance leads to a significant reduction in the number of emergency department visits, and hospital admissions for inpatients. In addition, [28] have shown the effectiveness of cash transfer policies as one of the elements in the composition of social safety nets in improving children's health, reducing the risk of morbidity, improving nutrition, and reducing the use of health services due to an improvement in their health status.

In the literature, we can see that targeted household safety nets strengthen social cohesion by addressing distributional inequalities in society through poverty reduction and improved access to basic services for marginalized groups [29]. For example, some studies in Latin America and sub-Saharan Africa have shown that targeted cash transfers can increase social capital through greater participation in family and community activities [29]. In Kenya, findings across studies by researchers have linked greater community participation and consequent social capital to the ability of transfer recipients to share food and repay loans [30]. Similarly, a study in Zambia found positive effects on the social position of remittance recipients within communities, as other members were more willing to lend them money in the knowledge that they were better able to repay [31]. Devereux and Nzabamwita [32] assessed the impact of social protection programs on poverty reduction and food security in Sub-Saharan Africa. Devereux employed a comparative analysis of social protection programs across several African countries, using secondary data from national surveys and program evaluation.

Finally, several factors at the community level may moderate the impacts of cash transfer on morbidity and health-seeking behaviours. These include availability and quality of healthcare facilities [33], environmental factors such as access to clean water [34], the infectious environment and other factors. Relatedly, where supply-side conditions are poor, interventions to incentivize healthcare demand may be harmful. One initiative to incentivize institutional delivery in India led to overcrowded health facilities with overstretched healthcare workers resulting in increased perinatal mortality rates [35].

Brief history of social safety net programs in Togo

The use of the health care system is a real problem for most of the population, especially the poor. Many of the health policies put in place by policy makers do not promote more efficient use. This is in order to reduce the financial risks associated with large out-of-pocket payments for health care. To improve access to health care for the vulnerable population, the government has implemented the social safety nets Program. This program has been deployed in areas where the population has difficulties in accessing different components of the basic social safety nets. One of the objectives of the basic social safety nets in the area of health is to improve access to health care by extending free health care services to the most vulnerable population and by extending insurance coverage. Launched a few years ago to provide disadvantaged communities with better access to basic socio-economic

infrastructure and social security mechanisms, the Social Safety Nets and Basic Services (SSBS) project has far exceeded its initial objectives. The program, financed by the World Bank, has already benefited 195,871 people, instead of the 130,000 initially planned [36]. In Togo, the social safety net program (cash transfers, healthcare, school meals) benefit the population, with 92,345 beneficiaries having access to these social safety nets (Report EHCVM, 2018). In addition, 9,345 people benefited from cash transfers (Report EHCVM, 2018). Given the undeniable socio-economic impact of the social safety nets and basic services on Togolese households, the main expected results are to ensure that poor communities have better access to basic social and collective infrastructure (primary education, healthcare, water, sanitation) and to social protection, to integrate them into the development process and to prevent poverty from gaining ground in rural, semi-urban and urban areas.

Today, social protection programs are mainly funded by international agencies, but the Togolese government is increasingly seeking to finance these programs nationally. Thus, in order to ensure the scalability and sustainability of these programs, resource mobilization is the primary challenge facing social protection in Togo. To take account of financial constraints and rationalize resources, it seems crucial to prioritize and therefore make political choices by targeting assistance to certain people in order to maximize the effects of the programs. In the longer term, it aims to meet the country's social protection challenges. This involves the extension of cash transfers combined with accompanying measures; national financing of cash transfers and basic accompanying measures for beneficiaries (one beneficiary per household); technical assistance and studies to support the structuring and strengthening of the social protection system, particularly its ability to respond to shocks.

Methodology

Propensity score approach

A propensity score matching (PSM) statistical approach would be used to evaluate the impact of social safety net program on health care utilization in Togo. Propensity score matching (PSM) is one of the multivariate methods that can be used to construct matched treatment and control samples that have similar distributions on many covariates [37–39]. The statistical comparison group is constructed on the basis of a model of the probability of participating in propensity score treatment using observed characteristics. Propensity scores are used to estimate treatment effects. The most common treatment effects adopted in the literature include: the average treatment effect (ATE), which is the average treatment effect for the whole sample; the average treatment effect on treated individuals (ATT), which is the participation effect, and the average treatment effect on untreated individuals (ATU), which is the non-participation effect.

In theory, individuals are expected to decide to participate in the program when the expected (but unobserved) utility of participation $\left(D_1^*\right)$ is greater than the utility of non−participation $\left(D_0^*\right)$. Participation in the program is observable as a dichotomous choice: $D = 1$ if $D_1^* > D_0^*$ and $D = 0$ if $D_1^* < D_0^*$, which is modelled as follows:

$$D_i^* = Z_i\beta + \varepsilon_i \text{with } D_i = 1 \text{ if } D_1^* > D_0^*, \tag{1}$$

otherwise $D_i = 0$

où Z is a matrix of explanatory variables, β is a vector of parameters to be estimated and ε_i is a vector representing the normally distributed error term with mean zero and variance σ_ε^2.

Endogenous switching regression

The difference in outcomes between adopters and non-adopters may be due not only to observable heterogeneity, but also to unobserved heterogeneity due not only to observable heterogeneity, but also to unobserved heterogeneity. For this reason, we use endogenous change regression (ESR) to account for both observable and unobservable endogeneity in the adoption decision by simultaneously estimating the adoption function (equation) and the endogenous change function (equation) by simultaneously estimating the adoption function (Eq. (1)) and the outcome equation of interest for each group. According to [40] and [41], the ESR can be estimated as follows:

$$\text{Regime } 1\left(\text{beneficiary}\right) : y_1 = X_1 w_1 + \epsilon_1 \; if \; D = 1 \tag{2}$$

$$\text{Regime } 0\left(\text{Non beneficiary}\right) : y_0 = X_0 w_0 + \epsilon_0 \; if \; D = 0 \tag{3}$$

where y_i is a vector of dependent variables representing outcomes for adopters (y_1) and non-adopters (y_0), Xi is a matrix of explanatory variables, x_i is a vector of parameters to be estimated, and ϵ_1, and ϵ_0 are error terms.

Following the work of [42] we assume a normal joint distribution for the error terms in the equations below with zero mean and the variance–covariance matrix (Ω) to control for selection bias in Eq. 8 as:

$$\Omega = cov(\varepsilon_i, \varepsilon_1, \varepsilon_0) = \begin{pmatrix} \sigma_{\epsilon 0}^2 & \sigma_{\epsilon 1 \epsilon 0} & \sigma_{\epsilon 0 \varepsilon} \\ \sigma_{\epsilon 1 \epsilon 0} & \sigma_{\epsilon 1}^2 & \sigma_{\epsilon 1 \varepsilon} \\ \sigma_{\epsilon 0 \varepsilon} & \sigma_{\epsilon 1 \varepsilon} & \sigma_{\epsilon}^2 \end{pmatrix} \tag{4}$$

where; $\sigma_1^2 = \text{var}(\varepsilon_1)$; $\sigma_{\epsilon 0}^2 = var(\varepsilon_0)$; $\sigma_\epsilon^2 = var(\mu_i)$; $\sigma_{\epsilon 1 \epsilon 0} = cov(\varepsilon_1, \varepsilon_0)$; $\sigma_{1\epsilon} = cov(\mu_i, \varepsilon_1)$; $\sigma_{0\mu} = cov(\varepsilon_0, \mu_i)$ σ^2 represents the variance of the error term and represent a variance of the error terms, $\sigma_{\varepsilon 0}^2$ and $\sigma_{\epsilon 1}^2$ also represent the

error terms of these equations. According to [43]. When there are unobserved factors associated with selection bias, it is likely that the correlation between the error terms in Eq. 4 and Eq. 8a for beneficiaries ($\sigma_{1\epsilon}$) and 8b for non-beneficiaries ($\sigma_{0\mu}$) for households gives rise to an endogenous switching regression (ESR), which implies that $\sigma_{B\mu} \neq \sigma_{1\epsilon} \neq 0$. In this case, when $\sigma_{0\epsilon} = \sigma_{0\epsilon} = 0$ there is therefore an exogenous switching regression (ESR). Thus, following the work of [44] we assume $\sigma^2 = 1$, since α in Eqs. 4 is estimable only up to the scalar product. Moreover, $\sigma_{\epsilon 1\epsilon 0} = 0$; since π_1 and π_0 are never observed.

The ESR can be used to compare the actual outcomes expected of adopters (7) and non-adopters (8), and to study hypothetical counterfactual cases where non-adopters have adopted (9) and adopters have not (10), as follows:

$$E(Y_1|D=1) = \omega_1 X_1 + \lambda_1 \sigma_{\epsilon 1 \varepsilon} \quad (5)$$

$$E(Y_0|D=0) = \omega_0 X_0 + \lambda_{0i} \sigma_{\epsilon 1 \varepsilon} \quad (6)$$

$$E(Y_0|D=1) = \omega_0 X_1 + \lambda_1 \sigma_{\epsilon 1 \varepsilon} \quad (7)$$

$$E(Y_1|D=0) = \omega_1 X_0 + \lambda_0 \sigma_{\epsilon 1 \varepsilon} \quad (8)$$

Finally, we calculate the average treatment effect on treated patients (ATT) as the difference between (5) and (8) and the average treatment effect on non-adopters (ATU) as the difference between (7) and (6). We also calculate the effect of baseline heterogeneity for the group of adopters (BH1) as the difference between (5) and (7), and for the group of non-adopters (BH2) as the difference between (8) and (6).

Source of data

Empirical studies on the demand for health care are based on data collected from households. The data come from recent national household surveys in Togo. These are the 2018 Harmonized Household Living Conditions Survey (EHCVM). These are surveys on welfare issues in Togo. These surveys were conducted by the National Institute of Statistics and Economic and Demographic Studies (INSEED). The sample size of the EHCVM survey is 6171 households, including 2270 urban households and 3901 rural households. These different surveys cover information such as health expenditure, education expenditure, income sources, socio-demographic information, housing characteristics and access to basic infrastructure, food and non-food expenditure.

Description of variables

The explained variable

Social safety nets refer to publicly funded non-contributory transfers of resources (cash or in-kind) to poor or vulnerable individuals or households with the aim of helping them in some way to lift themselves out of vulnerability [16]. We can then define the explained variable as follows:

The variable explained is a component of the social safety nets in the participation of the different programs. Thus, we consider free health care programs, the use of impregnated mosquito net donations and food supplements for malnourished children. This allows us to identify households that participate in social safety net programs or not. This allows us to define a dichotomous variable indicating the decision of households to participate or not in basic social safety nets through the following procedure:

$B_i = 1$ if households participate in at least one social safety net program

$B_i = 0$ This is the case if households do not participate in any social safety net program

Explanation and measurement of certain key variables

- **Social safety**

Social safety nets are measured in different ways in the literature. Devereux and Sabates-Wheeler [45] identify three main orientations for social safety nets: protective, by helping to alleviate the deprivations faced by individuals; preventive, by seeking to prevent individuals from future deprivations; and promotive, by helping to increase individuals' real incomes and capabilities. Freeland and Cherrier [9] show that the most common justification for social safety nets is that they are useful within poverty reduction and risk management strategies. According to [16] social safety nets refer to publicly funded non-contributory resource transfers (cash or in-kind) to poor or vulnerable individuals or households with the aim of helping them in some way to lift themselves out of vulnerability. In this study, social safety nets are measured as one of the program (e.g. cash transfer, school feeding, health care, social protection) that a household or one of its members has received from the public authorities over the last 12 months.

- **Health services**

Ann Aday et al. [46] uses Andersen's model of health behaviour as a conventional tool for studies on the use of health services. This model postulates that health service use is a function of three sets of factors, namely predisposing factors, enabling factors and need factors [47]. In this study, four dummy variables are used to capture the

Table 1 Definition of variables

Variables	variable description	Operationalization	Signe attendu
Dependent variables			
Social nets	One a participant has benefited from at least one social net program in the last 12 months	No = 0; Yes = 1	
Explanatory variables			
Age	Age of the head of household	discrete	-
Genre	Gender of household	0 = male; 1 = female	+
place of residence	The household resides in an area	0 = urbain; 1 = rural	
Health services	The household has used health services in the last 12 months	No = 0; Yes = 1	-
Lomé	The household lives in Lomé region	No = 0; Yes = 1	+
Maritime Region	The household lives in the maritime region	No = 0; Yes = 1	+
Région des Plateaux	The household lives in the plateaux region	No = 0; Yes = 1	+
Région Centrale	The household lives in the Centrale region	No = 0; Yes = 1	+
Région de Kara	The household lives in the Kara region	No = 0; Yes = 1	+
Régions des savanes	The household lives in the Savanes region	No = 0; Yes = 1	+
Primary education	The household has primary education	No = 0; Yes = 1	-
Secondary education	The household has socondary education	No = 0; Yes = 1	+
higher education	The household has higher education	No = 0; Yes = 1	+
Protection against malaria	The household is protected against malaria	No = 0; Yes = 1	-
Health problems	The household had a health problem requiring hospitalization in the last 12 months	No = 0; Yes = 1	+
Agriculture	The household works in the agricultural sector	No = 0; Yes = 1	-
Agriculture + breeding	The household works in the agricultural and breeding sector	No = 0; Yes = 1	-

health services used by households. These are health services assisted by health professionals (doctors, assistants, nurses and midwives) that took place in a health facility (private or public). The variables are coded 1 if the household used a health service in a health establishment; otherwise the variable is coded 0.

The explanatory variables

The explanatory variables used in this article include socio-economic variables. They were selected on the basis of existing literature on social nets and health care utilization. These variables are listed in the following Table 1.

Result

Descriptive analysis of the difference test

The difference test was used to compare the means of these two groups in order to infer a relationship between the treatment group and the control group. A difference test on the observable characteristics of the socio-economic factors was performed to see the similarity between the two groups (control group and treatment group). Table 2 shows that the two groups are identical according to a number of characteristics observed in individuals when they enrol in a social safety net program, such as distance, insurance coverage, agriculture, gender and place of residence. However, there were significant differences, particularly with regard to certain variables such as age, level of education and health services. The results show a greater use of health services by treated groups, i.e. individuals who have benefited from social safety nets. These results only reflect averages and do not show the actual effect of social safety nets on healthcare use. The fact that there are still differences

Table 2 Test de différence entre les groupes sur les caractéristiques observables

Variables	Control group	Treatment group	Difference test between the two groups
Age	44.28	44.72	−1.0765
Distance	1.260	1.214	1.697**
Insurance cover	0.410	0.480	5.14***
Agriculture	1.532	1.520	2.28**
Social protection	0.872	0.922	−6.248***
Gender	0.269	0.256	1.035
Education	1.030	0.945	3.616***
Place of residence	0.603	0.694	−7.052***
Health service	0.161	0.192	−2.868***

Standard deviations in brackets *** $p<0.01$, ** $p<0.05$, * $p<0.1$

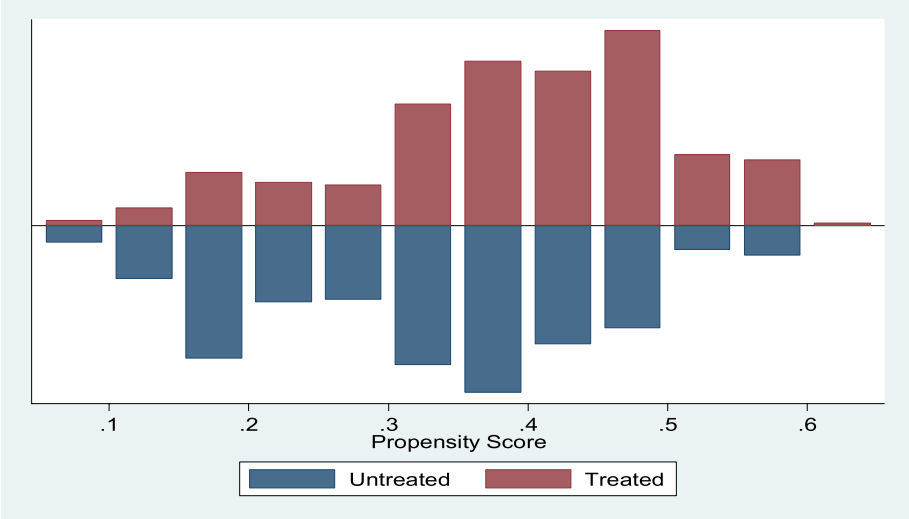

Fig. 1 Distribution of propensity scores between the two groups

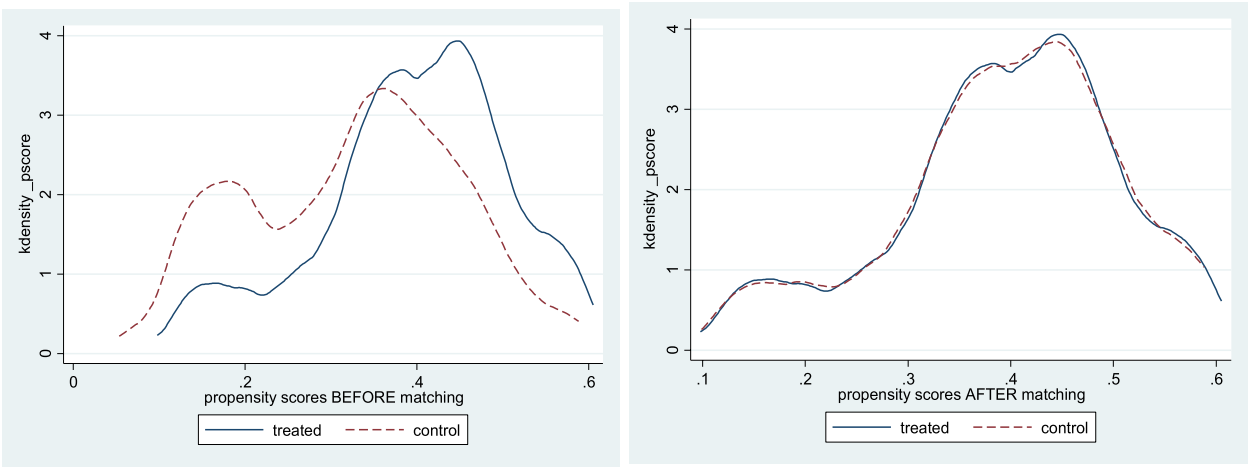

Fig. 2 Analysis of households with and without social safety nets in using health care before and after treatment

between the observable characteristics of the two groups biases this result. Matching by propensity scores is therefore relevant, as it will enable more robust results to be obtained by neutralising the biases.

Distribution of propensity scores between the two groups

The Fig. 1 shows that the results of the common support propensity score distributions are defined on the interval [0.1; 0.75]. Analysis of this graph shows that the propensity scores have an overlapping distribution in the common support region for the treatment and control groups. This overlay shows that each treated individual (basic social net recipient) can be matched to at least one control individual. However, the smallest values of the propensity scores are around 0.1. The matching procedure will use very little data due to the lack of information in this area.

Analysis of the distribution of propensity scores before and after matching

The Fig. 2 analyses a kernel density plot that estimates the underlying distributions of propensity scores before and after treatment or matching. Before matching, there is a substantial difference in the distributions of the two groups. But after matching, the distributions of the propensity scores are almost identical. The analysis of this figure shows the evolution of households receiving and not receiving basic social safety nets. Before the treatment, we see that the curve for households not receiving basic social safety nets (the control group) is skewed

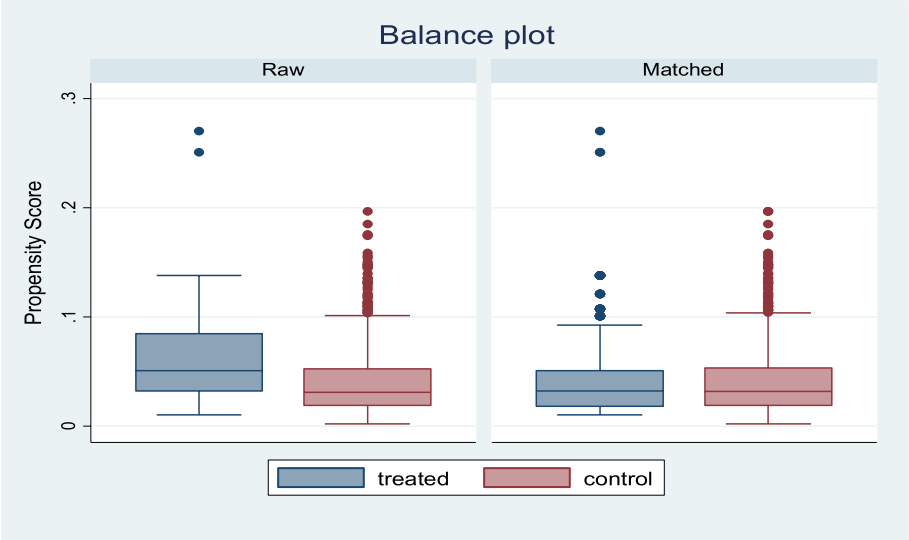

Fig. 3 Test for covariate balance

to the right compared to the control group. This shows that they have a high chance of benefiting from the basic social safety nets to reduce health care utilization. After treatment, there is no difference between the treatment and control groups. The two curves are merged and similar. It can be said that the matching between the beneficiary and non-beneficiary households of the basic social safety nets has been successfully completed.

Test for covariate balance

On the Fig. 3, we focused on the quality of its results by showing the proofs of the balancing test, the different matching algorithms and the quality of the matching. For the actual balancing, we performed several iterations to estimate the propensity score. We note that after matching, the individuals are more identical and similar.

Variance inflation factor test (VIF)

During the regression analysis, the VIF indicates that the factors are not correlated with each other (multi-colinearity), which could not influence the other factors and reduce the reliability of the model. A check of the variance inflation factor (VIF) for certain variables showed that the data are free of multicollinearity, with VIF values between 1.04 and 3.44, which is well below the VIF threshold of 10 [48]. Thus on the Table 3, we see that the average VIF, which is equal to 6.61, is less than 10. There is therefore no high degree of multi-colinearity.

Sensitivity analysis

Ichino et al. [49] have outlined and briefly proposed sensitivity analysis for propensity score matching estimators.

Table 3 Variance inflation factor (VIF)

Variable	VIF	1/VIF
social safety nets	1.08	0.9249
Marital status	1.95	0.5138
Age	3.44	0.2821
Age	2 .81	0.3558
Lome	0.505	1.98
Maritime	1.84	0.5425
Plateaux	1.66	0.6021
Centrale	1.59	0.6274
Savanes	1.74	0.5742
Female gender	1.76	0.5681
Household size	1.63	0.6143
Malaria protection	1.04	0.9611
Health problems	1.04	0.9635
Agriculture	1.26	0.7936
Agriculture + breeding	1.97	0.5075
Service	2.14	0.4672
Trade	1.45	0.6907
Primaire education	1.59	0.6292
Secondaire education	2.07	0.4837
Distance	1.12	0.8942
Mean VIF	**6.61**	

One of the central assumptions of the analysis is that the treatment assignment is inconsistent with the set of covariates W, i.e. this assumption no longer holds.

In table 4, the robustness of the nearest-neighbor correspondence is estimated at 0.052. This could be produced in particular by the characteristics of the covariates used

Table 4 Analysis of different estimation methods

Caracteristic	Effectif		Characteristic Effect in % of estimation methods		
			Neighborhood method		Simulation analysis
Health care utilization	**Treated**	**Control**	ATT: Analystical standard errors	ATT: Boostrapped standard errors	ATT
	513	2300	0,052** (0,021)	0,052** (0,029)	0,062** (0,028)

Standard deviations in brackets *** $p<0.01$, ** $p<0.05$, * $p<0.1$

to simulate U (access to care) rather than ATT. However, sensitivity conclusions follow from a simulation exercise. Through the estimates, the variable access to healthcare is suggested in discussions as the search for confounding factors. This potential confounding factor is expected to be a real baseline estimate, and one that can be associated with a large selection as well as their effects.

Through our results, U is explained at 4.83% of the reference estimate (0.062—0.059) / 0.062 = 0.0483). This is a confounding factor that must have a very large effect on outcome and treatment selection. More specifically, U must increase the relative probability of having above-average (T = 1) of a higher factor. The presence of these factors among the unobservable factors that confound similar characteristics can be considered implausible at a current parameter (where the set of corresponding variables W is quite rich). All in all, we can say that the exercises of these simple simulations support the robustness of the corresponding estimate, as the health care access factor is a confounding factor that has a positive impact on health care utilization.

Analyses of the results of estimating the propensity score using probit regression

The results of the probit model for the PSM method are presented in Table 5. As indicated, the main objective of this article is to analyze the impact of social safety nets on health care utilization. The Wald chi2 test shows that the explanatory variables are jointly statistically significant (p-value = 0.000). The model is therefore significant overall. These results indicate a strong association between the use of health care and the adoption of social safety nets, underlining the importance of participatory methods. The coefficients for the maritime region (1.451), Plateaux (1.158), Centrale (1.047), Kara (0.941); the coefficient for the agriculture variable (1.145) and social protection (0.597) are large, positive and significantly different from zero. This shows that the social safety net program is beneficial for most individuals residing in each of Togo's economic regions. Furthermore, the coefficient of the distance variable (−0.401) is negative and significantly different from zero. This indicates that individuals living in remote areas are less likely to benefit from social safety net program. Similarly, the level of secondary education is negatively correlated with social safety net beneficiaries. The coefficient for this variable is negative and significantly different from zero. This indicates that individuals with secondary education benefit less from social safety net program than individuals with no education. This implies that there is a high rate of individuals with a level of education who are not taken into account by policymakers as their target for this program.

Determinants of utilization of health care services by households not covered by social safety nets

The results of the econometric estimations in Table 6 show that there are a significant number of variables that determine the use of health care services by households that participate in social safety nets. In addition, the variable age of the head of household determines non-participation in social safety nets. This coefficient is negative and significant at 1%. This means that the older the age of the head of household, the less interested he or she is in the various social safety net programs, given the registration processes involved in obtaining the goods intended for them. Sometimes these steps take quite a long time and there are other conditions or criteria for the use of health care services. Furthermore, the coefficient of age squared is positive and significant at the 1% level. This shows that as the age of the head of household increases, he or she tends to increase the use of health care services due to the depreciation of his or her health stock. Gender is a determining factor in the use of health care by households. This coefficient is positive and significant at the 1% level. For the household, being headed by a household head is positively correlated with health care utilization. The economic regions of a country also influence non-participation in social safety nets in the use of health care services. The coefficient of the plateaux region variable is positively correlated at the 1% level with use of health services. The more a household not benefiting from social safety nets resides in the plateaux region, the higher the probability of not using health care services. This result could be explained by the characteristics of the environment itself, which affects household productivity through non-existent or obsolete infrastructure, which limits the opportunities available to households and forces them into low-profit activities such as seasonal and subsistence farming.

Table 5 Estimation of propensity scores: Probit model

Traitement	Coefficient	Marginal effects
Age	0.032	0.0073
	(0.026)	(0.005)
Age2	-0.0003	-0.0007
	(0.00027)	(0.0006)
Female	0.073	0.0163
	(0.161)	(0.0361)
Urban	0,010	0.0022
	(0.188)	(0.042)
Maritime	1.451***	0.324***
	(0.266)	(0.0589)
Plateaux	1.158***	0.258***
	(0.281)	(0.062)
Central	1.047***	0.234***
	(0,282)	(0.0626)
Kara	0.941***	0.210***
	(0.2689)	(0,059)
Savannah	1.183***	0.264***
	(0.268)	(0.064)
Agriculture	1.145	0.256***
	(0.263)	(0.174)
Agriculture + Livestock	-1.241	-0.277
	(0.781)	(0.1744)
Protection sociale	0.597**	0.1334**
	(0.263)	(0.058)
Health problem	0.597	-0,019
	(0.263)	(0.064)
Primary	0.108	0,0242
	(0.187)	(0,418)
Secondary	-0.317	-0.071
	(0.167)	(0.0418)
Distance	-0,4011**	-0,089**
	(0.167)	(0.0373)
Hadicap problem	0.126	0.0281
	(0.233)	(0.052)
Service de santé	-0.049	-0.011
	(0.146)	(0.032)
constant	-2.609***	
	(0.722)	

Standard deviations in brackets

*** $p<0.01$

** $p<0.05$

* $p<0.1$

Analysis of the socio-economic determinants of household participation in social safety nets

Generally, the different economic regions of a country determine the actions of the state as a result of these different policies. In the Table 6, the coefficients for the five economic regions except for Greater Lomé, which is excluded from the basic social safety nets, are positive and significant at 1%. This means that the more a household resides in these regions, the higher the probability that it will benefit from the various social safety net programs. This could be explained by the fact that the social safety nets remain a necessary but not sufficient means of ensuring the totality of the household's resources to meet the additional needs incurred. Moreover, in these regions, a large majority of the population cannot access health care facilities due to lack of financial means. There is also a high mortality rate.

In addition, the coefficient on the agricultural variable is positive and significant at the 10% level. This implies that households working in the agricultural sector are positively correlated with the use of health care services by households participating in basic social safety nets. This result could be explained by the fact that these households have less access to financial resources to meet health care expenses should they fall ill. On the other hand, given the inadequacy of household expenditures, we see that they are obliged to combine agriculture and livestock farming to cope with financial problems. The coefficient of this variable is negative and significant at 10%. The more the household practices agriculture and livestock, the lower the probability of participating in social safety net programs. The health problem of households is a socio-economic factor that determines their participation in basic social safety nets. The coefficient on this variable is negative and significant at the 1% level. The more health problems a household has, the less likely it is to participate in social safety net programs.

The coefficient of the woman's level of education negatively influences participation in social safety nets. This coefficient is negative and significant at 1%. This means that when the woman's education level is high, the less she is interested in social safety nets which is more intended for the poorest households. This is because a higher level of education allows the individual to find a job or to undertake a business compared to an individual with a low level. All this facilitates access to and use of health care. This negative sign means that when a woman's level of education is high, she is less interested in social safety nets that are more targeted at the poorest households. She prefers to spend on the basic essentials offered by the policy maker such as mosquito nets, free health care and food supplements which are the components of social safety nets. Also, households with a high level of education have a higher probability of seeing their household consumption expenditure increase compared to their counterparts with a low level of education. However, this probability is greater for households not participating in social safety nets than for those participating in them.

Table 6 Analysis of the determinants of households benefiting or not from safety nets

	Equation	**Regime 1**	**Regime 2**
	Endogenous switching regression		
		Beneficiary households to BSF	**Non-beneficiary households to BSF**
VARIABLES	**Social nets**	**Use of health care services**	**Use of health care services**
Age	0.0200	0.021	−0.0270***
	(0.016)	(0.016)	(0.0068)
Age2	−0.0002	−0.0002	0.0003***
	(0.0001)	(0.0001)	(0.00006)
Female	0.0270	0.028	0.2696***
	(0.0947)	(0.0947)	(0.0420)
Urban	−0.172	−0.115	−0.1091**
	(0.11)	(0.071)	(0.0538)
Maritime region	0.8451***	0.229***	0.115
	(0.156)	(0.139)	(0.0924)
Plateaux region	0.7028***	0.194***	0.1633**
	(0.1662)	(0.1328)	(0.0834)
Central region	0.6137***	0.0972***	0.0975
	(0.168)	(0.1295)	(0.0839)
Kara region	0.5437***	0.2233***	0.0716
	(0.156)	(0.1235)	(0.0745)
Savannahs region	0.6903***	0.1638	−0.0204
	(0.1728)	(0.1387)	(0.0871)
Agriculture	0.7236*	0.1933	−0.0452
	(0.4271)	(0.344)	(0.1443)
Agriculture + Livestock	−0.7999*	−0.3032	0.0227
	(0.343)	(0.343)	(0.144)
Education			
Primary	−0.0422	0.1715***	0.2174***
	(0.0999)	(−0.0381)	(−0.0254)
Secondary	−0.251**		
	(0.1030)		
Distance	−0.307***		
Health problem	(0.0877)		
	−0.2721*		
Disability	−0.0651		
	(0.1286)		
Health problems	−0.2504***		
	(−0.0609)		
Constants	−1.33***	−0.0741	1.125***
	(0.4244)	(0.359)	(0.1541)
$\hat{\sigma}_{\varepsilon i}$		**−0.5721*** **	**−0.7062*** **
		(−0,0292)	(0.0753)
$\hat{\rho}_j$		**0.897*** **	**0.5525***
		(0.3119)	(0.316)

Standard deviations in brackets

*** $p < 0.01$

** $p < 0.05$

* $p < 0.1$

Table 7 Impact of social safety nets on health care utilization

	Decision stage		
Subsamples effects	**Participante in BSF**	**Not participation in BSF**	**Treatment**
Beneficiary households to BSF	(a) 0.5129	(c) 0.926	−0.413*** (ATT)
	(0.11)	(0.009)	(0,0149)
Households not receiving BSF	(d) −0.1372	(b) 0.541	−0.678*** (ATU)
	(0.0081)	(0.007)	(0.011)
Heterogeneity effects	0.650	0.385	
	BH1 (0.013)	**BH2** (0.012)	

***, **, * represent the statistically significant difference between decision the two decision stages (To participate in BSF and not participate in BFS) at 0.01, 0.05 and 0.1 levels, respectively

The distance between household locations and health care services determines the use of and participation in basic social nets. The coefficient on the distance variable is negative and significant at the 1% level. This means that the further away households are from health services, the less likely they are to benefit from social safety nets for health care use. This is because it is at these health centers that households will seek treatment. However, to get to these health centers, they have to spend extra money on transport. As a result, households no longer see the need to benefit from free health care.

The correlation coefficients $\widehat{\rho}_1 et \widehat{\rho}_0$ between the error term in the selection equation and the error terms in the outcome equations, respectively (8a) and (8b) are significantly different from zero, this explains that the social net recipients were indeed endogenous. This implies the presence of a selection bias [50] This implies the presence of a selection bias and constitutes a justification for the use of the endogenous switching regression. Moreover, the estimated covariances $\widehat{\sigma}_{\varepsilon 1}$ and $\widehat{\sigma}_{\varepsilon 0}$ are significant (p-values = 0.000), this is evidence of endogenous switching and rejection of the null hypothesis of no selection bias, which is indeed consistent with the endogenous switching model [51].

Evaluation of the impact of social safety nets on health care utilization

✓ Impact of social safety nets on health care utilization

Table 7 presents the impact of social safety nets in real and counterfactual scenarios using the ESR method. The results show that the level of use of health care services is lower. These results show that households that are beneficiaries of the social safety nets would have had less −80.52% (−0.413/0.5129) use of health care services than if they had not participated in the social safety nets. Indeed, those who did participate had significant negative effects on their level of health care utilization. These results show the indirect effect of the mitigation of social safety nets by policy makers to avoid hunger, malnutrition, poverty, unemployment. All of these strengthen the health status of households by avoiding certain diseases that may lead them to use health care services. Hence the negative effect of basic social safety nets on health care utilization. Also, the average effect of treatment on households that do not participate in social safety nets is −67.8%. This result implies that households not participating in social safety nets would have 49.16% (−0.678/−0.137) of using health care services if they had participated. Social nets therefore have a positive effect on the group of households that do not participate in social nets.

Analysis of the decomposition of the impact of social safety nets according to the household's membership of a specific sub-group

Analysis of the impact of basic social safety nets by rural areas

The analysis of this distinction of beneficiaries of social safety net programs according to place of residence refers to the fact that in the literature, households residing in rural areas are considered to be more vulnerable and more in need of basic social safety nets. We disjunctively highlight the impact of basic social safety nets according to place of residence, to assess whether this variable constitutes a favorable element for apprehending the scope of these social protection policies.

Table 8 presents the impact of basic social safety nets in actual and counterfactual scenarios using the ESR method for households residing in rural areas. The results show that the impact of social safety nets is less pronounced in rural areas following the use of healthcare services. Indeed, rural households that actually

Table 8 Impact of basic social safety nets on healthcare utilization in rural areas

	Decision stage		
Subsamples effects	**Participante in BSF**	**Not participation in BSF**	**Treatment**
Beneficiary households to BSF	(a) 0.447	(c) 0.872	−0.425*** (ATT)
	(0.013	(0.012)	(0.017)
Households not receiving BSF	(d) −0.205	(b) 0.476	−0.682*** (ATU)
	(0.011)	(0.011)	(0.014)
Heterogeneity effects	0.652***	0.395***	
	BH1 (0.016)	BH2 (0.014)	

***, **, * represent the statistically significant difference between decision the two decision stages (To participate in BSF and not participate in BFS) at 0.01, 0.05 and 0.1 levels, respectively

Table 9 Impact of basic social safety nets on healthcare utilization in urban areas

	Decision stage		
Subsamples effects	**Participante in BSF**	**Not participation in BSF**	**Treatment**
Beneficiary households to BSF	(a) 0.644	(c) 1.034	−0.389*** (ATT)
	(0.015)	(0.013)	(0.021)
Households not receiving BSF	(d) −0.0545	(b) 0.619	−0.674***(ATU)
	(0.011)	(0.009)	(0.014)
Heterogeneity effects	0.698	0.414	
	BH1 (0.194)	**BH2** (0,017)	

***, **, * represent the statistically significant difference between decision the two decision stages (To participate in BSF and not participate in BFS) at 0.01, 0.05 and 0.1 levels, respectively

participated in the basic social safety nets would have had less −95.7% (−0.425/0.447) healthcare utilization had they not benefited from the basic social safety nets. This can be explained by the fact that the social safety nets, which are mostly aimed at vulnerable households in terms of food supplements, have helped to improve the nutritional status of these households. They are in good health and rarely fall ill. Hence low use of healthcare services. On the other hand, the average treatment effect on households not participating in social safety nets is −0.682. This result implies that households not participating in social safety nets would be 33.68% (−0.682/−0.205) more likely to use healthcare services if they had participated in these basic social safety net programs. Social safety nets therefore have a positive effect on the group of households not participating in social safety nets. This is because households that do not benefit from these programs run the risk of malnutrition, of not having used the donations of impregnated mosquito nets and free health care to prevent certain diseases. In such precarious conditions, these households run the risk of falling ill regularly. Hence the positive effect of increased use of health care services for households that did not participate in these basic social safety nets.

Analysis of the impact of basic social safety nets by urban areas

On the other hand, in urban areas, the results in Table 9 show that the impact of social safety nets is still less pronounced in urban areas, although this reduction only represents −60.40% (−0.389/0.644) for urban households and −80.52% when considering the whole sample. These results could be explained by the fact that the various programs linked to basic social safety nets are a determining factor in the use or non-use of healthcare services in urban areas. This shows that in urban areas, there is a decline in the use of healthcare services.

Discussion

This study examines the impact of social safety nets on health care utilization among Togolese households. It shows that the impact of a social safety net policy by the government in a context where the majority of households were vulnerable before the introduction of

the program and paid for health services mainly out of pocket. These conditions are likely to exist in many other low-income countries that are considering investing more in social safety net programs to achieve coverage of health care access and utilization. To our knowledge, this study is unique in Togo in that it examines the impact of introducing a social safety net program that covers such a large population group over a long period of time. This helps to inform the debate on the potential benefits of the social safety net program in increasing household welfare and having better social capital, financial protection and enabling them to reduce their use of health care services. This implies the indirect effect of social nets on the use of health care services.

The results found show that households that provided a social safety net program (eg, cash transfers, school feeding, health care, social protection) reduced the use of health services. Because social safety nets provide for the risk of falling ill. These results corroborate with certain studies where they have used cash transfers which is one of the characteristics of social safety nets. The results of [52] demonstrates a reduction in the prevalence of transmission among children whose parents received cash transfers. This allows them to reduce the use of health services [53]. In addition, social protection directly increases the assets and means available to the vulnerable population, thereby improving their well-being, as well as economic activity in general. It enables poor and vulnerable women and men to mobilize resources and take better advantage of public institutions to integrate more easily and on fairer terms into social and economic life [54]. These findings from Mexico indicate that there are direct pathways through which remittances affect health, outside of interactions with the health sector. In particular, the reduction in poverty achieved through cash transfers may affect the mental health of recipients, leading to reduced use of health services.

Our results are not consistent with those of [33, 54], which indicate the positive effects on the health status of children of households receiving cash transfers compared to children of non-recipient parents. However, in terms of health care utilization, household heads can use these cash transfers to pay for their children's health care. This has a positive effect on the use of care by children whose households receive cash transfers compared to children whose parents do not receive these transfers. In addition, the results found by [55] show a positive effect of cash transfers on the use of health care during the Covid-19 health crisis in Togo. These results are consistent with [56–58] who also found greater effects of these transfers on the use of health services especially in rural areas. It should be noted that this result is consistent with the conclusions of several other authors of the literature in sub-Saharan Africa.

Thus, two channels of transmission in this study are valued. The first channel is the financial protection of vulnerable households from savings, investments, and thus access to additional, often underused, preventive health services. While most of these preventive health services are provided free of charge by the government or at highly subsidized costs, access to them is still prohibitively expensive. Through financial protection, households benefiting from basic social safety nets are able to reduce indirect financial barriers and are healthier, resulting in reduced use of health care systems. Our second channel of effect is the use of health services. Throughout the literature on social safety net programs, protection of household health status through food supplements, free health care, and donations of insecticide-treated bed nets have been shown to reduce health service utilization. This provides valuable insights into how to design effective health systems policy.

Limit

Although we find positive, statistically and economically significant results, our analysis may have some limitations, some of which we would like to point out need to be acknowledged: First, our data also lack critical details that would allow us to accurately assess certain things. For example, we do not have actual data on the number of times households receiving social safety nets used health care services in a health facility. Nevertheless, our research was useful in predicting the importance of basic social nets for vulnerable households because they contribute to people's resilience, building the capacity of vulnerable households, families and systems to cope with uncertainty and risk of shocks. Secondly, our sample shows a low proportion of households benefiting from basic social safety nets because they are expensive to cover a large proportion of vulnerable households. But this allowed us to obtain a result that is consistent with the objectives. We suggest that future studies include a larger number of participants in the basic social safety nets given its impact on household resilience and alleviating their financial burden for health care.

In addition, we believe that integrating qualitative information through focus groups or interviews would provide a richer context for the quantitative results. Furthermore, the data available did not allow us to extend the scope to analyses of health outcomes and cost-effectiveness, which could enhance the relevance of the study.

Nevertheless, we believe that our research results have provided preliminary evidence of the impact of basic social nets on health care utilization.

Conclusion

This study contributes to the limited evidence on the impact of basic social safety nets on health care utilization. The study applied the endogenous switching method (ESR) on EHCVM data from households in Togo. The main results of the study reveal that households benefiting from social safety nets have seen an improvement in their lifestyle in terms of free health care, food supplementation, care for pregnant women, and donations of impregnated mosquito nets. All of these add up to a significant reduction in health care utilization because they already have a favorable health status and a healthy lifestyle. Hence our results show a negative effect on health care utilization. Furthermore, the analysis of the rural–urban decomposition of these social safety net households shows a positive impact on their vulnerability and subsequently reduces the likelihood of using health care services. Thus, social safety nets enable households to gain greater access to public services and increase investment in human capital, particularly in health and education, helping to boost productivity and make it easier for the poor to engage in gainful employment. Studies carried out in South Africa and Latin America repeatedly show a clear improvement in health and education outcomes, particularly following the implementation of conditional and unconditional cash transfer programs and social measures for health [59]. As an economic policy implication, our study advocates social protection policies by extending social safety net programs more favorable to vulnerable households in order to improve their health status. In addition, policy-makers need to target the adoption of social safety nets at the vulnerable population. Finally, a policy of inclusivity must be implemented for isolated or less-educated households likely to benefit from social safety nets enabling them to strengthen their human capital.

Despite the limitations of the database, we believe that this paper makes credible contributions to social safety net programs beyond the use of health services and financial protection. This study is of crucial interest to Togolese policy makers, especially those currently involved in the process of introducing the expansion of social safety net programs to other vulnerable groups involved in the process of introducing these programs. Our findings emphasize the importance of further examining the role of social safety nets, once access to health care is guaranteed.

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Ethic statement
Not applicable.

Authors' contributions
Y.T: designing and planning of study, data analysis, and manuscript preparation.

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Data availability
The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request to the following e-mail address: tossouyaovi@yahoo.fr.

Declarations

Ethics approval and consent to participate
The National Statistical Services of Togo, provided ethical clearance for household surveys. All participants in surveys provided informed, signed consent. The study was approved by the Institutional Review Board of the Directorate of Scientific and Technical Research (DRST) of the University of Lomé (Togo). 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.

Consent for publication
Not required.

Competing interests
The authors declare no competing interests.

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