Social capital and households' vulnerability to health shock in Togo

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Abstract

This study investigates whether being a member of a religious group, neighbourhood association or association of nationals helps Togolese households to cope with shocks related to a serious illness or accident of a household member, using the 2016 national survey conducted by the National Institute of Statistics and Economics and Demographics Studies (INSEED-Togo) in collaboration with a South African agency called FinMark Trust and the United Nations Development Fund (UNCDF). First, we used logit estimation and second, potential selection bias is eliminated by using propensity score matching to estimate the effect of membership in a religious group, neighbourhood association and national association on the vulnerability of households to a serious illness or accident of a member of the household. The results of logit estimation and propensity score matching show that religious groups have a greater impact on the ability of households to resist the vulnerability of a household member in shock to a serious illness or accident than neighbourhood association and association of nationals. The picture remains almost identical when individuals are classified by disadvantaged groups such as rural population groups and women.

I- Introduction

The concept of social capital has captured the imagination and attention of a wide range of scholars and professionals in diverse disciplines and practical arenas. To gain a better understanding of social capital, it is necessary to place it in the context of different theoretical types of capital. Capital, first of all, is both a concept and a theory (Lin, 2005). As a concept, it represents investment in certain types of resources of value in a given society, and as a theory, it describes the process by which capital is captured and reproduced for returns (Lin, 2005). For example, in the classical theory of capital, Marx defines capital as part of the surplus value created in a production process (Marx, 1933 (1849); Marx, 1995 (1867, 1885, 1894); Brewer, 1984). The human capital theory, for example, postulates that investment in certain human resources (skills and knowledge) may also generate economic returns, even for laborers participating in the production market (Johnson, 1960; Schultz, 1961; Becker, 1964/1993). Likewise, social capital theory conceptualizes production as a process by which surplus value is generated through investment in social relations (Lin, 2005).

There are many definitions of social capital but most overlap. Putnam and Coleman who are among the authorities of social capital's concept propose following definitions. Coleman (1990) defines social capital as a variety of different entities having characteristics in common: they all consist of some aspect of a social structure, and they facilitate certain actions of individuals who are within the structure. For Putnam (1995), social capital means, features of social life (networks, norms, and trust) that enable participants to act together more effectively to pursue shared objectives. While several other definitions draw upon these two seminal works of Coleman (1990) and Putnam (1995), there is no set definition of the concept in use.

Indeed, for Lin (2005), social capital is defined as resources embedded in one's social networks, resources that can be accessed or mobilized through ties in the networks. Through such social relations or through social networks in general, an actor may borrow or capture other actors' resources (e.g., their wealth, power or reputation). These social resources can then generate a return for the actor. The general premise that social capital is network-based is acknowledged by all scholars who have contributed to the discussion (Bourdieu, 1980; Bourdieu, 1983/1986; Lin, 1982; Coleman, 1988; Coleman, 1990; Flap, 1991; Flap, 1994; Burt, 1992; Putnam, 1993; Putnam, 1995; Putnam, 2000; Erickson, 1995; Erickson, 1996). In line with Putnam (1995), De Silva et al. (2005) state that social capital consists of five principal characteristics, namely: (1) community networks, voluntary, state, personal networks, and density; (2) civic engagement, participation, and use of civic networks; (3) local civic identity (sense of belonging), solidarity, and equality with other members; (4) reciprocity and norms of cooperation, a sense of obligation to help others, and confidence in return of assistance; (5) trust in the community. Sobel (2002) describes social capital as circumstances in which individuals can benefit from group membership. Thus, social capital refers to social life-networks, norms, and trust that enables households to act together more effectively to pursue shared objective (Putnam, 1993 ; Coleman, 1990).

One model of social capital (Brain and Hicks, 1998, cited in Krishna and Shrader, 2000) decompose social capital in two components : structural and cognitive social capital. The structural component refers to role, precedent, behaviors, networks, the extend and intensity of associational links or activity (Brain and Hicks, 1998 ; Mckenzie et al, 2002) while the cognitive covers perception of support, reciprocity, sharing, trust, attitudes and belief that produce cooperation (Brain and Hicks, 1998, cited in Krishna and Shrader, 2000).

An additional important construct is the difference between bonding (strong ties) and bridging (weak ties) social capital (Woolcock and Narayan, 2000 ; Granovetter, 1973). Narayan (1999) describes bonding capital as meaning of social cohesion within the group structure whilst bridging capital refers to the type of social capital that links different communities (or groups). According to Woolcock and Narayan (2000), strong ties refers to the close relationship between an individual and his family, friends, ethnic group, etc. This corresponds to intra-community social capital. Weak ties refers to the individual's contacts outside the ethnic group or the family (other entrepreneurs, other ethnic groups, banks, etc.). This corresponds to extra-community social capital. Each type of social capital has pros and cons and it is unclear which one ought to be reinforced in priority (Donfouet and Mahieu, 2012).

Multiple institutions nurture the habits and values that give rise to social capital, including community and other voluntary associations, families, church organizations, and cultural patterns (Brehm and Rahn, 1997).

It should be noted as stated by Fukuyama (1995) that one of the greatest weaknesses of the social capital concept is the absence of consensus on how to measure it. This difficulty comes from the fact that the distinction between the constituents and products of social capital often has been unclear. For instance, trust may be a constituent of social capital and collective efficacy an outcome, or vice versa, and as they are mutually dependent, this leads to difficulties in measuring and ascribing the cause and effect (Mckenzie et al., 2002). In the end, although indirect measures of social capital exists, collective efficacity may be the sine qua non of social capital (Sampson et al., 1997 ; Lochner et al., 1999).

Social capital has become a popular topic in the past decade and research linking it with health has come fast and furious (Veenstra, 2000). This importance attributed to social capital is such that in the 90s, one of the main goals of the World Bank was to use the potential of social capital to fight not only poverty but also ensure availability and access to health etc. (Donfouet and Mahieu, 2012). Hence, several papers have been devoted to social capital and health.

Research assert that social capital, defined as the institutions, relationships, attitudes, and values that govern interactions among people and contribute to economic and social development (Grootaert and van Bastelaer, 2001) is increasingly recognised as having a positive effect on individual health (Coleman, 1990, Putnam, Leonardi et al., 1993; Wilkinson, 1996). Cognitive social capital (feelings of trust and reciprocity) was shown by De Silva (2005) to be inversely associated with common mental disorders as expected.

D'Hombres et al. (2006) study the impact of social capital on individual self-reported health (SRH) for eight countries from the Commonwealth of Independent States (Armenia, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Ukraine). They rely on indicators for social capital such as : individual degree of trust, participation in local organisations, social isolation. Their results show that, in the overall sample comprising all eight countries, the individual degree of trust is positively and significantly correlated with health, either in pooling estimation or when we rely on instrument variable estimators with community fixed effects. Similarly, social isolation is negatively and significantly associated with health, irrespective of the procedure of estimation. On the other hand, the effect of being member of a Putnamesque organisation is more ambiguous and usually not significantly related to health. Giodano and Lidstrom (2010) is in line with D'Hombres et al. (2006) use British Household Panel Survey between 1999 and 2005. After adjusting for other well-known health determinants, the results that inability to trust deteriorate self-rated health

(SRH), while increased levels of social participation improve health status over time. The same result is one more time found with trust with Giordano et al. (2012) after conducting a temporal (causal) relationships study on social capital and SRH in United Kingdom, using British Household Panel Survey to follow the same individuals between years 2000 and 2007. Their findings reveal that levels of the social capital proxy « generalised trust » at time point (t-1) are positively associated with SRH at subsequent time point (t), even after taking into consideration levels of other well-known determinants (such as smoking status) at time point.

The impact of trust and participations are also highlight by Kawachi et al. (1997) who proved in US states that higher levels of trust and greater participation in clubs and associations were related to lower levels of mortality from most of the major causes of death.

Fiorillo and Sabatini (2015) measuring social capital in Italie by the frequency of meetings with friends find that individuals who meet friends every day or more time times a week are approximately 11-16% more likely to report good health.

Social capital may prove important in explaining some intriguing recent findings. Chief among these is the 'ethnic density' effect, in which the incidence of psychotic disorders, suicide and psychiatric hospital admission rates in the UK is elevated among members of ethnic minority groups living in areas with lower proportions of ethnic minorities (Boydell et al., 2001; Neeleman et al., 2001). It has been hypothesised that social capital within a given minority group diminishes as it becomes a smaller proportion of the population. Conversely, members of any minority group may feel excluded and stigmatised in areas where there is a high degree of cohesion among the majority group.

In their research on how religious social capital influence health, Maselko et al. (2011) define religious social capital as the social resources available to individuals and groups through their social connections with a religious community. These resources include shared values, levels of trust among members of one's own religious group and religious hierarchy; as well as levels of socializing that are specific to one's own religious group. Assessment of religious social capital covered 4 domains: 1) structural social capital, 2) values and norms, 3) trust, and 4) religious/spiritual social support. The results on a sample of 104 community dwelling adults residing in a single urban neighborhood in a large US city suggest that individuals who are experiencing more urban stressors are more involved in their religious communities lends further support to the possibility of a substitution effect between investing in neighborhood vs religious social capital.

Finally, Murayama et al. (2012) in their review, hilight that social capital does not always generate beneficial effects on health ; some forms might negatively affect health outcomes. And, while being beneficial for the health of one population sub-group, the same form of social capital might be harmful for others.

However, research linking social capital and the vulnerability to health shocks is still rare. As outlined by Woolcock and Narayan (2000), social capital helps the poor to manage risk and vulnerability. Many scholars have proposed a definition of vulnerability. Glewwe and Hall (1994) argue that vulnerability differs from poverty in that it is not a static concept, including people's reactions to risk shocks. Coudouel and Hentschel (2000) define vulnerability as the consequence of the impact of various risks that may affect the level of welfare. Ligon and Schechter (2003) argue that vulnerability is the utility loss due to risk shocks.

In that line, the only studies on social capital and vulnerability to health shocks are those related to Community-based health insurance (CBHI). Community-based health insurance

(CBHI) emanates from the limitations of the loan-based microcredit programs (microfinance) in protecting low income households from health shocks (Donfouet and Mahieu, 2012). Hence, CBHI is a form of micro health insurance which is mainly used in rural areas in developing countries (Donfouet and Mahieu, 2012). The success of CBHI depends on the existence of social capital in the community (Donfouet and Mahieu, 2012). Consequently, adhesion to a group and trust are necessary to enable poor communities establish social capital and have access to CBHI. This access to CBHI is necessary to allow households whistanding health shock. In a recent study, Donfouet et al. (2011) investigated the link between CBHI and social capital in rural Cameroon (Central Africa). The social capital was measured as the degree of involvement of households in associations. The results of the study confirmed that social capital has a positive, and significant impact on the demand for CBHI. In the same way, authors such as Coleman (1990), Putnam et al. (1993), Wilkinson (1996), unanimously acknowledge that given that social capital in a community acts positively on the importance people attach to their health, a community with a high level of social capital will be more ready to support a new, unknown health policy such as CBHI. Consequently, adhesion to a group and trust are necessary to enable poor communities establish social capital and have access to CBHI. Furthermore, Zhang et al. (2006) demonstrate that social capital measured by trust and reciprocity has a positive and significant effect on the demand for CBHI in China.

In Togo as in most of developing countries, the issue of health shocks is instrumental as households are frequently hit by severe predictible and unpredictible illness shocks that could go to a dramatic situation. In Togo, poor household are typically unable to access formal insurance markets to help insure against such shocks. Thus, because of the financial difficulties related to poverty, Togolese do not regularly go to the hospital. And the negative effects of health shock can be definitive with probable death.

In this study, we investigate the impact of social capital on Togolese households' vulnerability to health shocks in Togo. To the best of our knowledge, there is no study in Togo on social capital and vulnerability to health shocks in Togo. The only study implying social capital is that of Noglo and Androuais (2015) where the authors measure the impact of social capital on the repayment performance in joint-liability group lending**.** By collecting primary data for 2008 through a sample of 36 credit groups gathering 258 people in rural and semi-urban areas of the Maritime region, the authors use the logit model to show that peer social capital (same gender, same ethnic group and same occupation) positively affect the repayment performance of groups. However, same religion is counterproductive in terms of reimbursement. As for vulnerability to shocks, the only existing research is carried out by Afawubo et al. (2019) where they consider the impact of mobile adoption on households' vulnerability to health, climatic, and agricultural production shocks.

The originality of our paper is twofold: First, it complements the studies of Afawubo et al. (2019), and Noglo and Androuais (2015) and improves our understanding whether social capital is highly reliable to help Togolese households combat predictable and unpredictable health shocks. Second, we use probit estimation and eliminate the potential selection bias using ii) propensity score matching to estimate social capital effect on households' vulnerability to health shocks.

The research question we address in this study is the following: Does social capital alleviate households' vulnerability to adverse health shocks and strengthen their capacity to cope with them? The institutions considered giving rise to social capital are: religious groups, neighborhood associations, association of nationals (Brehm and Rahn, 1997). These institutions favorise collective efficacity to whistand health shocks.These sources representing

bonding social capital (strong ties) accumulation are what the data have provided. As already mentioned, strong ties corresponds to intra-community social capital. Thus, according to Granovetter's (1973), strong bonds symbolize the amount of time, emotional intensity, intimacy and reciprocal services.The social capital indicators retained are: belonging to religious group, belonging to neighborhood association, and belonging to association of nationals.

The shocks mentioned in this study are serious illness or accident of a household member. When such shocks occur, whether they were predictable or not, and hit households that do not have access to insurance institutions to protect them, they push the members into severe and persistent poverty when they can afford hospital fees which are expensive or they cannot afford hospital fees, so they die.

The results of the estimates using the probit and propensity score matching (PSM) methods suggest that religious groups are more effective in influencing the ability of households to resist the vulnerability of a household member in the event of a shock to a serious illness or accident than neighbourhood associations and association of nationals. The situation remains almost similar when individuals are classified by disadvantaged groups such as rural population groups and women. But both neighbourhood associations and religious groups help rural households withstand health shocks.

The remainder of the article is organized as follows. In Section 2, we present the data, we expose the methodologies in Section 3, and the empirical results are presented in Section 4. The section 5 is devoted to the robusteness check and finally we conclude in Section 6.

II- Data and sampling methodology

The data used in this study come from a national survey conducted in 2016 by the National Institute of Statistics and Economics and Demographics Studies (INSEED-Togo) in partnership with a South African agency called FinMark Trust, which has had the expertise in conducting such surveys in a number of countries. In Togo, as part of the government's efforts to improve financial inclusion, the government has solicited the assistance of the United Nations Capital Development Fund (UNCDF) to conduct a nationwide "FinScope Consumer Survey". The project was realised in partnership with the National Fund for Inclusive Finance in Togo (FNFI) and the Department for the Promotion of Inclusive Finance (DPFI). This may contribute to measuring the accessibility and the use of financial services in all regions of Togo. These households interviewed come from 520 enumeration areas (EAs), out of 6657 in the territory).

First of all, the EAs were randomly selected stratum by stratum from the 12 constructed domains: indeed, each of the five regions that make up the country is divided into two strata: urban and rural, to which is added Lomé (the capital city) which is subdivided into "commune de Lomé" and "Golf urbain". Second, 10 households are retained in each EA also using a simple random sampling method. The FinScope survey sample then consists of 5,200 households that cover the entire country. 5,197 households were retained after the data were cleared.

In fact, this random sample (of 5,200 households) is drawn from the entire population database provided by the 2010 General Population and Housing Census (GPCS), which

contains 1,206,396 households for a total of 5,843,327 inhabitants. When the empirical results were realized, our estimation sample was shortened because it was limited to observations for which all inthemodel variables exist; the income variable in particular lacks a considerable number of observations. We therefore have a sample of 2,458 people, aged 15 years or older, who were randomly selected following a Kish grid during the survey.

III- Empirical strategy

To analyze the impact of social capital on the probability that households in Togo to be resilient to serious illness or accident of a member of household shock, we estimate the following equation:

$$Shocks_i = \alpha + \beta_1 Religious\ group_i + \beta_2 Neighborhood\ association_i + \beta_3 Association\ of\ nationals_i + \beta_4 X_i + \varepsilon_i \quad (1)$$

Where $Shocks_i$ is a dummy variable taking value 1 if the household i has experienced serious illness or accident of a member of household ; 0 otherwise.

The indicators of social capital are as follows :

$Religious\ group$ take 1 if the household i belong to a religious group ; 0 otherwise
$Neighborhood\ association$ take 1 if the household i belong to a neighborhood association ; 0 otherwise
$Association\ of\ nationals$ take 1 if the household i belong to an association of nationals; 0 otherwise
X_i is the list of control variables: age, sex, income, level of education, socio-professional category, residing in a rural versus urban environment, (see Afawubo et al, 2019). These independent variables are based on resource theory as illustrated by (Lai et al.,1998, Linetal.,1981,2012).
Finally, ε_i is an idiosyncratic error term with

$$E[\varepsilon_i \backslash Religious\ group_i, Neighborhood\ association_i, Association\ of\ nationals_i, X_i]=0 \quad (2)$$

To assess if religious group, neighborhood association, and association of nationals help households in Togo to be resilient to serious illness or accident of a member of household shock, Equation (1) is estimated by performing firstly logit regression models to account for the dichotomous nature of the dependent variable (Wooldridge 2010).

However, potential concerns with this empirical strategy regard the households' heterogeneity and endogeneity issues. In particular, if some factors that influence both religious group, neighborhood association, and association of nationals help households to be resilient to be resilient to serious illness or accident of a member of household are not taken into account, logit estimates may suffer from omitted variable biases.

Moreover, although it is reasonable to argue that being membership of religious group, neighborhood association, and association of nationals was exogenous, we cannot assume that households that have benefited from the services of religious group, neighborhood association, and association of nationals are statistically identical to those that have not benefited from these services.

Therefore, a positive coefficient estimated for the variable " religious group, neighborhood association, and association of nationals " could reflect, for example, that being membership of religious group, neighborhood association, and association of nationals has a short-term causal impact on resilience to serious illness or accident of a member of household shock. These issues are discussed in the rest of the study. First, we include in the right-hand side of equation (1) a large set of control variables to capture important dimensions of households and their households' heterogeneity. Second, we calculate the propensity to be protected against to serious illness or accident of a member of household shock.

To verify the robustness of our previous method, we perform propensity score matching estimates to address potential selection bias in processing.

IV- Results and discussion

Overall sample

The results of the estimation of equation 1 using the logit model are reported in Table 1. Estimation results presented in Table 1 show that being a member of religious group enables households to overcome serious illness or accident of a member of household shocks, (see column 1). Community trust and reciprocity norms are integral components of community social capital in religious institution. Some evidence supports a positive relationship between trust and reciprocity norms at the community or health status level (Franziniet, 2005; Kawachiet, 1997; Lochneret, 2003; Subramanian et al, 2002; Wenet et al, 2007, Koenig, Koenig, King and Carson, 2012).

Donfouet and Mahieu, (2012) propose an approach based on community-based health insurance (CBHI) and social capital on household vunerability in the face of health-related shocks. CBHI is an emerging concept that is based on providing financial protection (mutual aid and solidarity) against the cost of health shocks and improving access to quality health services especially in low-income households that are excluded from formal insurance. CBHI is often implemented in some developing countries including Togo and is based on the existence of social capital. Religious groups in Togo develop strong social capital (bonding social capital) favorising the existence of CBHI. This would explain the effectiveness of belonging to a religious group in protecting households from vulnerabilities related to serious illness or accident of a member of household. Out of the CBHI strategy, other reasons could explain the contribution of religious groups in whistanding households' vulnerability to illness and accident shocks. Indeed, Involvement in religious groups provides a number of social resource benefits. These benefits include the size of its social networks, the frequency of interactions with network members, the actual and expected exchanges of various types of informal and formal assistance, and positive perceptions of supportive relationships. Religious organizations, because they embody explicit norms and beliefs about helping behaviours,

provide natural environments for the development of formal and informal supportive relationships , (Bradley , 1995 ; Ellison , 1994, Ellison and George 1994).

Religious groups can facilitate the provision of support in the contexts of illness or accident of his members by improving any kind of assistance. Religious groups could provide information to their members about health care access. In addition, because members share similar frames of reference and meaning, religious groups provide a context in which their member could interpret problematic life situations and provide to them the necessary assistance. Religious institutions actively shape attitudes and beliefs about important roles in life in ways that promote interpersonal harmony for mutual assistance in a situation of illness. Lastly, self investment in religious groups leads to supportive relationships and norms of reciprocal support that are maintained over time.

The neighborhood association and the association of nationals do not have a significant effect in protecting households from vulnerabilities related to serious illness or accident of a member of household. This difference compared religious groups could be explained by the fact that members of religious groups take more advantage of strong social capital than those of the neighborhood association and the association of nationals.

Indeed, in countries where there is a high level of social exclusion of foreigners, they are more likely to develop a stronger social bond. However, in Togo, foreigners are not subject to major exclusion and therefore do not need to develop enough and significantly social capital ~~of~~ in the type "national association" or "foreigners' association". This could explain the fact that the "association of nationals" does not have a significant effect on household vulnerability to health-related shocks.

Controlling the geographical location effect

In this section, we analyze whether the geographical location of households influences the previous results. In this perspective, we multiply the variables representing social capital namely religious group, neighborhood association, and association of nationals by the variable that represents geographical location, namely rural versus urban, and re-estimate equation 1. The geographical location variable is coded 1 for rural households and zero for urban households.

The results are reported in Table 1, column 2 using the logit method. The results show that in rural areas, religious group and neighborhood association effectively support households to resist to serious illness or accident of a member of households. Thus, contrary to the results in the previous section, where only religious groups help households to cope with serious illness or accident of a member of households, in this section, neighborhood association also, is an effective tool for households to withstand health shocks. In rural areas, the proximity of households could explain the effectiveness not only of religion groups, but also of neighbourhood associations. Also the social context in rural areas is characterized by familiarity and friendly social norms, as well as long-established social networks. Interactions between neighbours in rural area lead to the creation of strong social networks. This situation would strengthen social ties in churches and neighbourhood associations and consequently help rural households in togo to cope with health-related shocks. Another advantage of rural familiarity is that residents often lend a hand to neighbours, rally to local causes and are generous with their time and resources in the event of a family emergency. People often rely on their neighbours when they face challenges, especially health emergencies.

Controlling for gender effect

In this section we analyze whether being female vs male changes the effects of social capital on households' ability to cope with health shocks. We estimate the equation 1 by integrating the interaction variable of social capital with the gender variable. The gender variable is coded 1 for a female household and zero for a male household. The results of the model estimation using the logit method are reported in Table 1 column 3.

Before analyzing the results, it should be noted that in the previous section, our results showed that in rural areas, religious group and neighbourhood association effectively support households to resist serious illness or accident of a member of households.

In addition to that, the results reported in Table 1 column 3 suggest that religious group support women experiencing difficulties related to serious illness or accident of a member of households. This result is similar to that of Browning, and Cagney, (2007) who showed that the protective effect in the case of neighbourhood social capital is considerably stronger for women.

In summary religious group is effective tool for helping households to cope with serious illness or accident of a member of households. Neighborhood association and nationals Association have no strong significantive effect when households are confronted with health shocks.

Table 1. Social capital and vulnerability to illness shock using logit regressions

Variables	Whole sample	Rural/Urban	Female/Male
log_Income	.0554592(1.13)	.0631108(1.29)	.0513686(1.05)
Rural	-.2423265**(-2.09)		-.245761**(-2.12)
Religious group*rural		.2948478**(2.44)	.3149624**(2.10)
Neighborhood association*rural		.3843113*(1.63)	.0867377(0.28)
Association of nationals*rural		.1184691(0.38)	.1884806(0.57)
Religious group	.2432562**(2.24)	.0875772(0.54)	.0709787(0.55)
Neighborhood association	.1768032(1.11)	.4122512(1.32)	.1291525(0.58)
Association of nationals	.0681152(0.44)	.0373113(0.20)	-.0586171(-0.21)
Self_employment	-.1116111(-0.78)	-.0907729(-0.63)	-.1071258(-0.74)
Unemployed	.0560085(0.28)	.0741925(0.37)	.0442478(0.22)
Trader	-.0105474(-0.07)	.0154117(0.10)	-.0346166(-0.24)
Age	-.006196(-0.37)	-.0059674(-0.35)	-.0069604(-0.41)
Age2	.0001394(0.75)	.0001371(0.73)	.000149(0.80)
Sex	.2787044**(2.51)	.2808877**(2.53)	
Read-Write	-.0570628(-0.48)	-.0232226(-0.20)	-.0380363(-0.33)
Maritime	.0389561(0.23)	-.0316069(-0.19)	.0432786(0.25)
Centrale	-.8658018***(-4.44)	-.9459088***(-4.87)	-.8648994***(-4.42)
Kara	.548039***(3.22)	.4916504**(2.92)	.5480513***(3.22)
Plateaux	-.0251743(-0.14)	-.0975914(-0.53)	-.0207555(-0.11)
Savanes	.2835844(1.57)	.2047855(1.15)	.2851767(1.57)
_cons	-.7907122(-1.32)	-.7974684(-1.33)	-.6764959(-1.12)
Observations	2,458	2,458	2,458
Log-likelihood	-1272.8235	-1273.8042	-1272.875
LR chi2	94.90	92.94	94.80

Prob>ch2	0.0000	0.0000	0.0000
Pseudo R^2	0.359	0.352	0.0359

Note: Dependent variables: Shocks. The coefficients reported in the table are the odds ratio for the resilient to shock with explanation variables namely: networks variables (Religious group, Neighborhood association, Association of nationals), occupation (self-employed, unemployed, merchant), individual characteristic (education level, age, age squared, sex), geographical location such as rural vs urban and region dummies (Plateaux, Centrale, Kara, Savane, Grand-Lomé; Maritime without Grand Lomé is the modality of reference for the estimates). z statistics in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

V- Robustness

Households that are affiliated to religious group, neighborhood association, and association of nationals may be statistically different from those that are not members of any association, when a serious illness or accident of a member of household shock occurs, even if the shock was exogenous and unexpected.

By applying propensity score matching (PSM), we therefore test the robustness of the relationship between our health (serious illness or accident of a member of household) shocks and membership of a religious group, neighborhood association, and association of nationals. The PSM method allow us controlling sample selection by adjusting the observable variables before the shock.

The variables used for matching the two samples (households affiliated with a religious group, neighborhood association, and association of nationals ; and those not affiliated with any association) are the same as those included in our more complete specification of Equation (1) namely occupation variables (self-employed, unemployed, merchant), individual characteristic (education level, age, age squared, sex), geographical location such as rural vs urban and region dummies (Plateaux, Centrale, Kara, Savane, Grand-Lomé; Maritime without Grand Lomé is the modality of reference for the estimates).

To assess the quality of the matching, Appendix 1, 2, and 3 present the differences between the mean value of a subset of the variables which are used to match the treatment and control groups. The quality of the matching presented in Appendix 1 concerns that of the model whitout any interactive variable such as geographical location or gender effects. Those of the geographical location and gender are presented in Appendix 2 et Appendix 3 respectivelly.

Overall the figures in Appendix 1,2, and 3 confirm that the two groups, for each of the three cases although initially different, appear to be rather similar after the matching between those who are affiliated to a religious group, neighborhood association, and association of nationals and those who are not affiliated to any association. We note no statistical differences in the means of the reported values and only two significant ones using PSM.

Finally, after imposing the common support condition, Table 2 displays the Average Treatment Effect (ATE) and the Average Treatment Effect on Treated (ATET) estimates obtained using the nearest neighbour matching procedure for the whole sample and by controlling geographical location and gender effects.

A significant level of social capital is generally correlated with a high social capital level among individuals, which enables the well-being of other members of the group to be taken into consideration. Indeed our results show that for the overall sample, by monitoring the effects related to place of residence and also gender show that the religious group is the best social capital tool that allows households to withstand to serious illness or accident of a

member of households shocks. Thus, religious groups are therefore the best channel or tool for Togolese households to cope with health shocks.

Table 2. Social capital and vulnerability to illness shock using propensity score matching

	Whole sample		Rural/Urban		Female/Male	
Variable	ATET	ATE	ATET	ATE	ATET	ATE
Religious group	.052** (2.23)	.056** (2.86)				
Religious group*rural			.057* (1.64)	.055* (1.75)		
Religious group*sex					.118** (2.21)	.053** (2.29)
Neighbourhood Association	.028 (0.71)	.086 (1.98)				
Neighbourhood Association*rural			-.007 (-0.20)	.003 (0.10)		
Neighbourhood Association*sex					-.055 (-1.46)	-.022 (-0.59)
National Association	.033 (0.84)	.017 (0.58)				
National Association*rural			.027 (0.91)	.021 (0.46)		
National Association*sex					-.119 (-1.39)	-.041 (-0.34)
Observations	2,458	2,458	2,458	2,458	2,458	2,458

Note: ATE and ATET-PSM estimates including all the covariates in the most extensive specification as controls. We impose the common support condition using the teffects stata command which implements nearest neighbour matching on the estimated propensity score. The standard errors implemented in teffects psmatch are those derived by Abadie and Imbens (2012).). z statistics in parentheses; *** p < 0.01, ** p < 0.05, * p < 0.1.

Appendix 1. Quality of the matching procedure, whole sample

	Mean			t-test		
	Treated	Control	%bias	t	p > t	V(T)/V (C)
Rural	0.391	0.291	2.6	0.61	0.544	0.92
log_Income	0.386	0.486	−3.4	−0.86	0.391	0.91
Religious group	0.101	0.108	2.5	0.66	0.512	0.92
Neighborhood association	0.446	0.447	−0.9	−0.21	0.833	1.03
Association of nationals	0.052	0.055	−2.6	−0.57	0.568	0.80*
Self_employment	0.341	0.342	−0.3	−0.09	0.931	0.97
Unemployed	0.484	0.506	−5.6	−1.31	0.189	0.96
Trader	0.067	0.067	0	0.01	0.994	1.05
Age	0.292	0.293	−0.2	−0.04	0.97	1.07
Age2	0.601	0.589	2.5	0.57	0.566	.
Sex	0.451	0.434	3.5	0.79	0.432	.
Read-Write	0.423	0.437	−2.8	−0.66	0.511	.
Maritime	0.346	0.337	1.8	0.41	0.681	.
Centrale	0.308	0.336	−6.0	−1.35	0.178	.
Kara	0.174	0.164	2.6	0.64	0.524	.
Plateaux	0.172	0.163	2.1	0.52	0.601	.
Savanes	0.419	0.444	−5.0	−1.14	0.255	.

Appendix 2. Quality of the matching procedure, controlling for geographical location effect

	Mean			t-test		
	Treated	Control	%bias	t	p > t	V(T)/V (C)
Religious group rural	0.234	0.245	−2.12	−0.24	0.812	0.82
Neighborhood association rural	0.614	0.503	6.7	0.89	0.373	0.86
Association of nationals rural	0.091	0.092	−0.3	−0.05	0.961	0.84
log_Income	0.050	0.053	−3.5	−0.46	0.648	0.82
Religious group	0.323	0.307	6	0.83	0.406	0.96
Neighborhood association	0.066	0.069	−2.3	−0.38	0.705	0.68*
Association of nationals	0.321	0.324	−1.2	−0.16	0.873	1.03
Self_employment	0.330	0.337	−1.9	−0.25	0.805	0.94
Unemployed	0.630	0.630	0.0	0.00	1.00	.
Trader	0.460	0.466	−1.3	−0.16	0.875	.
Age	0.404	0.383	4.4	0.56	0.574	.
Age2	0.676	0.642	7.4	0.91	0.363	.
Sex	0.586	0.586	0.0	0.00	1.000	.
Read-Write	0.543	0.559	−3.1	−0.39	0.693	.
Maritime	0.148	0.160	−3.3	−0.43	0.664	.
Centrale	0.417	0.380	7.6	0.96	0.336	.
Kara	0.395	0.448	−11.1	−1.35	0.177	.
Plateaux	0.419	0.394	5.4	1.19	0.233	.
Savanes	0.162	0.163	−0.312	−0.07	0.945	.

Appendix 3. Quality of the matching procedure, controlling for gender effect

	Mean			t-test		
	Treated	Control	%bias	t	p > t	V(T)/V (C)
Rural	1.992	1.750	28.800	−0.16	2.440	0.014
Religious group gender	1.887	1.714	20.600	0.91	1.870	0.062
Neighborhood association gender	1.081	1.467	−17.600	−0.25	−1.600	0.111
Association of nationals gender	0.972	0.982	−0.500	−0.05	−0.050	0.958
log_Income	0.035	0.023	5.200	0.89	0.640	0.526
Religious group	0.721	0.641	17.100	0.31	1.500	0.134
Neighborhood association	0.681	0.679	0.400	0.83	0.030	0.975
Association of nationals	0.092	0.054	14.500	0.56	1.160	0.246
Self_employment	0.064	0.078	−5.400	−0.38	−0.460	0.643
Unemployed	0.049	0.011	22.400	0.80	1.640	0.106
Trader	0.021	0.035	−8.400	−0.39	−0.720	0.472
Age	36.805	40.674	−37.800	−0.16	−3.470	0.002
Age2	37.823	36.922	8.800	0.96	0.790	0.433
Read-Write	−0.563	−0.721	26.600	1.19	2.340	0.026
Maritime	0.475	0.360	2.5	0.22	0.645	0.854
Centrale	0.060	0.064	−2.41	−0.46	0.647	0.711
Kara	0.373	0.321	5.12	0.73	0.415	0.786
Plateaux	0.112	0.107	2.42	0.56	0.523	0.483
Savanes	0.186	0.174	4.51	0.53	0.62	.

Appendix 4: Variables names and definitions, descriptive statistics

Variables	Questions		Obs	%	Min	Max	Sample
Religious group	Which of these groups, if any, are you currently involved in or do you currently belong to? (Church or other religious group)	Yes	1,276	51.91	0	1	2,458
Neighborhood association	Which of these groups, if any, are you currently involved in or do you currently belong to? (Neighborhood associations)	Yes	259	10.54	0	1	
Association of nationals	Which of these groups, if any, are you currently involved in or do you currently belong to? (Church or other religious group)	Yes	283	11.51	0	1	
Income	Information about the income amont				5,500	7,000,000	
Rural zone	Household located in the rural zone as defined by the Statistical service	Yes	1,068	43.45	0	1	
Self employed	What is your main occupation? (Self employed)	Yes	402	16.35	0	1	
Unemployed	What is your main occupation? (Unemployed/jobless)	Yes	167	6.79	0	1	
Trader	What is your main occupation? (Trader)	Yes	421	17.13	0	1	
Age	How old are you?				15	99	
Sex	0 = Female 1 = Male	Male	1,196	48.66	0	1	
Read-Write	Can you read and write in any language?	Yes	1,545	62,86	0	1	

VI- Conclusion

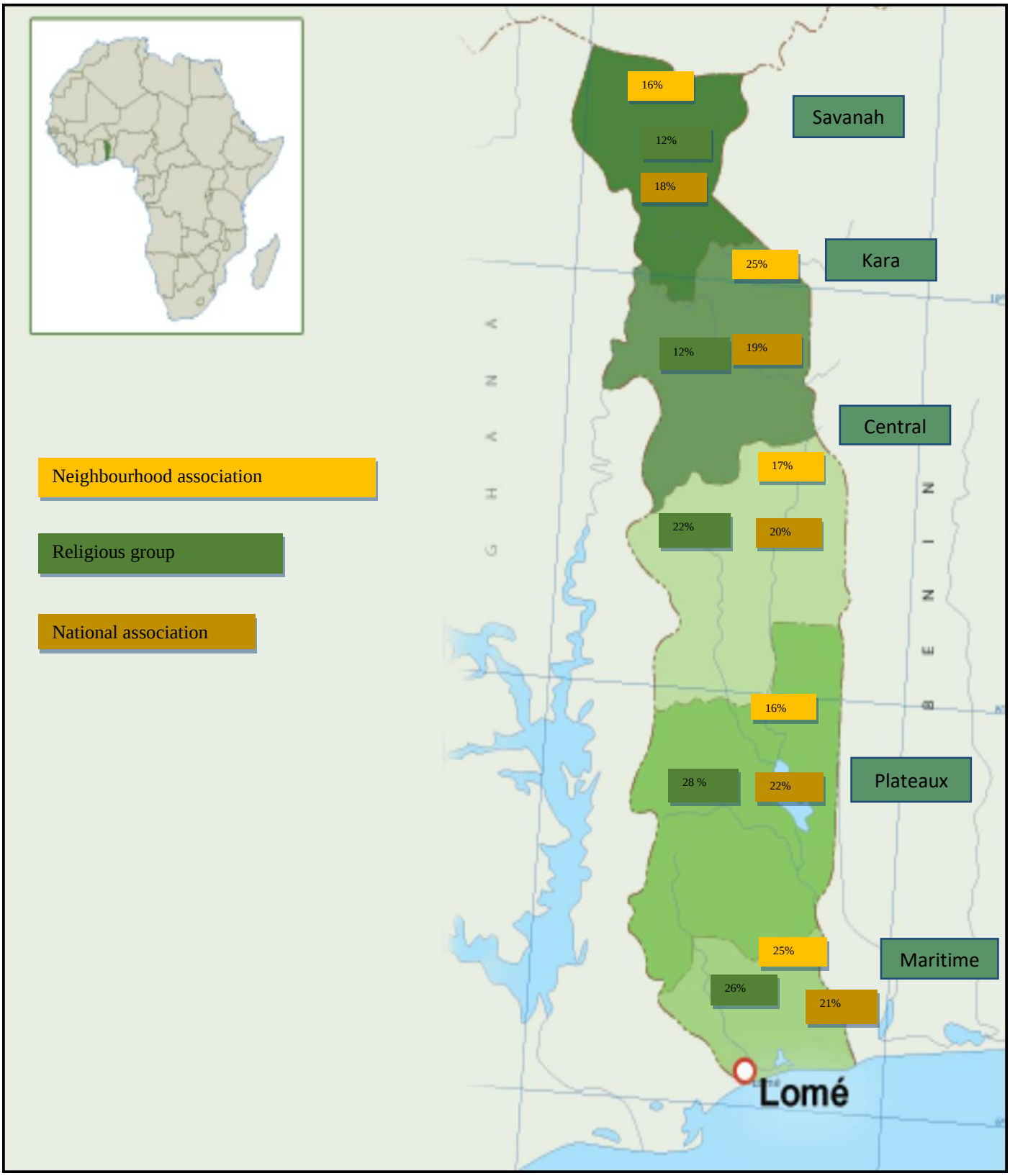
The Togolese government's commitment to ensure adequate health care for their populations. Thus, the health policy is expressed in the socio-economic development programmes monitored by Togo from 1960 to recent years. Despite these different policies, the health situation in Togo is characterized by enormous problems and needs. However, despite the efforts of Togolese government, the health situation in Togo has not improved much to date. This health situation is essentially characterized by high rates of continued high infant and child mortality due to disease infectious and parasitic diseases such as malaria, diarrhoeal diseases, acute respiratory infections, measles, whooping cough, diphtheria and diseases caused by nutritional deficiencies (Koffi-Tessio et al., 2000).

Social capital, which is defined as "the institutions, relationships, attitudes and values that influence people' interactions and contribute to economic and social development" (Grootaert and van Bastelaer 2001), is also being recognized as an important factor in individual health (Coleman, 1990, Putnam, Leonardi et al. 1993 ; Wilkinson 1996).

The objective of this research is to explore whether the social capital represented by belonging to a religious group, neighbourhood association or national association would enable households to withstand health-related shocks. We use on the one hand the logit estimation and then the propensity score matching. The results showed that being a member of a religious group effectively protects households from shocks of a serious illness or accident of a member of the household. Even in rural areas and among women, membership of a religious group protects households from the shocks of a serious illness or accident of a member of the household. Membership of a neighbourhood association or a national association does not protect households from a serious illness or accident of a member of the household.

Policies must be implemented to strengthen the various mechanisms by which membership in a religious group may improve health. This includes strengthening formal networks as well as informal networks in religious groups, in such a way that an individual can access a collective body of information that will facilitate access to resources, including information that will improve the ability to resist to health shocks in Togo.

Figure1. Social capital repartition (%) by region in Togo



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