

Health, Poverty and Vulnerability between Generations in Senegal

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hilarguo@yahoo.fr**Abstract**

In this paper, we try to analyze the health status of individuals between different generations in linking their poverty and vulnerability level in Senegal. Data from vulnerabilities and chronic poverty survey in Senegal which is a biographical type survey conducted over the 2008/2009 period are used. Our methodology consists of two parts. First, we use a simple logit model to determine the factors explaining the use of health services in the different generation. Then we use a Propensity Score Weighting for measuring the impact of disease duration on intergenerational poverty. The factors explaining the use of health services vary from one generation to another. Overall, the factors are the sex of the individual, level of education, the place of residence, type of -water consumed its poverty level, the household size and ethnicity. The results based in a propensity score weighted regression indicate that the effect is significant at the 5% level for the older generations (generation before 1954 and generation 1954-1968) and 1% level in the younger generations (generation 1969-1978 and generation after 1978). In the generation before 1954, the effect is 0.48 and in the generation 1954-1968, it is 0.336. In the others generations, the effect is 0.254 for the generation 1969-1978 and it is 0.526 in the generation after 1978. Investments in health and raising the standard of education must engage one of the largest shares of national and local budgets. The social protection programs should be established as national priority.

Key Words: Biographies, chronic, logit model

1. Introduction

The strong correlation between the level of socioeconomic development of a country and the health of its population has been demonstrated by several studies. Indeed, health is an integral part of development since individuals are both actors and beneficiaries. Moreover, the causal links found at the macro level, are also at the micro level. For the individual, not to receive medical treatment is a sign of poverty; of even for a country, not having adequate infrastructure in health is a share of underdevelopment. Individuals and groups who are more or less poor health are characterized by various vulnerabilities that act mostly on their health by increasing the risk of morbidity or limiting the access capabilities of the health system. These vulnerabilities affect multiple groups of people throughout the special features of their environment or their lifestyle and according to their intrinsic characteristic.

In Senegal, the World Bank, in one of these work in 2006 show the finding that children and mothers richest living in the area of Dakar and others regions relatively rich live systematically longer and are healthier that children and the poorest mothers, living in poor areas; this with some very important differences. More recently, the Demographic and Health Survey (DHS-MICS, 2011) shows that in terms of health, the changing lifestyle in Senegal results in the appearance and or the increase in chronic disease. In the dynamics of the design and implementation of health programs

and the fight against poverty in Senegal, it is important to deepen the relationship between poverty and health by generation, to offer the types of actions and measures to enhance the contribution of health interventions on reducing poverty and improving the health of the poorest. The Chronic Poverty and Vulnerability Survey conducted in 2008/2009 is an important database for studying the link between health, poverty and vulnerability. Our research has four main parts. The first part presents a literature review on links between health and poverty and the second part focuses on the presentation and descriptive of data. The third part describes the methodology that we used in our research while the fourth part deals with the discussion of results. Our research ends with a conclusion and recommendations will follow.

2. Literature review

The impact of health problems on human development in general and poverty in particular is an important to analyze the performance of an economy. Indeed, health problems can seriously affect the production and household incomes. The disease can contribute to impoverish the household by the amputation of his income but also of its heritage. According to the World Bank (2006), poverty is also seen as a lack of basic human development indicators which include poor health, malnutrition and poor education school. Moreover, it is now widely recognized that small states of health and nutrition of the population is a key aspect of poverty. There are a number of factors typically associated with poverty that determine a poor health, malnutrition and high fertility. Among these factors are involved at household and community factors. Several authors have highlighted the key determinants of health status of an individual. It is in this sense that Genver (1976) found that among the main factors that determine health status of an individual, there is among other factors related to lifestyle that are grouped in social behavior. According to Berkman and Glass (2002), the underlying social and psycho-social determinants of health include social factors such as economic inequality, poverty, labor market and social change. Apart from aforementioned determinants Bach, Muszynski and Rioux (1993) further income, education and literacy. For Steenberghe and St-Amand (2006), access to housing, education, the ability to eat properly, to have some income, operating in a stable ecosystem, stability of accessibility resources and the possibility to operate in a socially just and to be treated fairly are all determinants of health. For them, the fields that exert a decisive influence on the health of the poor include education, nutrition, water supply and sanitation. As for Belanger et al. (2000), they argue that unemployment, financial insecurity and anxiety, the feeling of not having control over their financial future are all known determinants of adverse health.

Others authors have highlighted the links between an individual's health and poverty. Filmer (2003), citing a World Bank study shows that in twenty-one African countries, the 20% poorest households received an average of only 16% of public spending on health, against 27% for the 20% richest. In Senegal, Sall (2010) was able to gather from a survey, some pathways of young girls and single and married women in Senegal. He find as explanatory factors, in addition to the regeneration of areas of intimacy between partners, the obsolescence of institutions of control of sexuality, the devaluation of traditional values, the decline of parental authority, increased privatization of the wedding ritual and development of information technology and communication, the factor related to poverty. Ultimately, all these authors converge on

the fact that the health of a population is among others associated with experiences that go beyond the biomedical to move towards a more holistic development and the reduction of social inequalities such as poverty.

3. Data Sources

The sample for this survey consists of 75 census districts, 1,200 households and 2,400 biographies. In each census district, all households were counted before the random selection of 16 households to be surveyed. Within each sample household, two individuals were interviewed: the head of household and another household member (usually the main or secondary breadwinner). This biographical type survey allows for ready evaluation of poverty in “living conditions” by means of items that are used to note record the health, educational and housing characteristics of individuals and households. Biographical data collection was necessary to perform longitudinal analyses that are most appropriate for monitoring the changing conditions of life and appraise their degradation or improvement.

4. Methodology

Our methodology consists of two parts. First, we develop a simple logit model to determine the factors explaining the use of health services. Then we use a Propensity Score Weighting for measuring the impact of disease duration on poverty.

Logit Model

For each individual indexed by i , the endogenous variable y , which takes the value 1 if the individual uses a health center and 0 otherwise, is considered the manifestation of a "hidden" variable y_i^* unobservable, the latter being connected to the set of explanatory variables.

Thus we have:

$$y_i = \beta' x_i + u_i$$

$$y_i = \begin{cases} 1 & \text{if } y_i^* \geq 0 \\ 0 & \text{otherwise} \end{cases}$$

With, $\beta' = (\beta_1, \dots, \beta_k)$ is the coefficients vector, u_i the error term assumed independent and identically distributed iid, and $x_i' = (x_{i1}, \dots, x_{ik})$, the vector of explanatory variables. Thus the probability that an individual patient has recourse to a health center or not is:

$$\text{Pr ob}(y_i = 1) = \text{Pr ob}(y_i^* \geq 0) = \text{Pr ob}(u_i \geq -\beta' x_i)$$

The logistic is symmetric and we have:

$$\text{Pr ob}(y_i = 1) = \text{Pr ob}(u_i < \beta' x_i) = \Lambda(\beta' x_i) = \frac{e^{\beta' x_i}}{1 + e^{\beta' x_i}}$$

with Λ the distribution function of the logistic.

Propensity Score Weighting

The propensity score weighting analysis consists of a combination of propensity score matching and weighted OLS regressions. When treatment assignment is unconfounded with outcomes conditional on a possibly large set of covariates, Hirano and Imbens (2001) have proposed a class of estimators of effect based on weighted estimation of the regression function. The unconfoundedness assumption asserts that the distribution of outcomes in treatment group and control group is independent of treatment T conditional on the values taken on by a set of pre-treatment (control) variables X . We define $T = 1$ if the duration of the disease is greater than or equal to six months and $T = 0$ if the duration of disease is less than six months. We call Y the response variable. Our response variable is the poverty indicator that indicates that if the person is poor or not. The inverse of the propensity score is used to weight each observation in the treated group, and one minus the inverse of the propensity score is used as weights for control group members. The outcome measure (intergenerational wellbeing) concerns four generations (generation before 1954, generation 1954-1968, generation 1969-1978, generation after 1978). We estimate a separate regression for each generation.

5. Results and discussion

We first present the factors explaining the demand for health services and then the effect of disease duration on poverty. The results of the econometric analysis of the use of health services are presented in appendix. The factors explaining the use of health services vary from one generation to another. Overall, the factors are the sex of the individual, level of education, the place of residence, type of water consumed its poverty level, the household size and ethnicity. The analysis of the sex of the individual show that women have a higher probability to go to see in a health services than men. This result can be justified by the fact that women generally need to be accompanied by medical personnel in their pre or post natal or even outside of these two periods.

The use of health services is also higher for the educated compared to uneducated. Indeed, the more educated are more likely to be informed about certain diseases and risks. This result is much more significant in the first two generations. In both generations, people are adults especially in rural areas, are attached to tradition. People who are more educated are more likely to use health services because they are informed of the risk according to type of disease onset. The results also show that the residential environment is a factor in use of health services. Indeed, those who live in urban areas are more likely to go to see in a health facility than those living in rural areas. This raises once again the unequal distribution of health services nationally. If rural people take longer to reach the health facility nearest urban, it's the opposite. The greatest difficulty in access depending on area of residence, could explain the low attendance at health facilities very remote rural users. This result is evident in the first three generations. The standard of living is also a factor in the demand for health services. Poor people are less likely to use health services than those who are rich. Extreme poverty undermines the economic base of households, limits the availability of liquidity and clearly raises the question of the use of health services in case of

illness. The negative relationship between poverty and use of health services is more significant in the second and the last generation.

People living in households where also large in scale are less likely to use health services. Frankel (2004) found in his study in Senegal that larger households are thus characterized by a higher propensity to make more frequent use of external and traditional healers. In our results, it was significant in the first and the last generation.

Our results show that those who consume safe water are more likely to use health services than those who do not consume safe water. This result can be justified by the fact that those who prefer safe water know the risks involved in the consumption of contaminated water. Furthermore, the risk of microbial disease associated with non safe water use is currently a high priority topic. We can see that this result is significant in all generations. Finally, one of the determinants of the use of health services is ethnicity. Note that in the first generation, the Diola and Peul are less likely to use health services than other ethnic groups. In the second generation, it is the Diola who are less likely to use health services. As to the last generation, the Toucouleur are more likely to use health services than others. As found Frankel (2010) in his study, cultural practices, forms of social organization and behavioral norms vary among ethnic groups. Moreover, he finds that ethnicity is a differentiation factor treatment practices and procedures for management of the disease.

The results based in a propensity score weighted regression indicate that the effect is significant at the 5% level for the older generations (generation before 1954 and generation 1954-1968) and 1% level in the younger generations (generation 1969-1978 and generation after 1978). In the generation before 1954, the effect is 0.48 and in the generation 1954-1968, it is 0.336. In the others generations, the effect is 0.254 for the generation 1969-1978 and it is 0.526 in the generation after 1978. The time spent in disease by an individual has an adverse effect on their living conditions. Indeed, the more a person spends time in a disease, the more he is facing increased costs for their health. Thus, when the disease lasts a long time, their income decreases and they have less control over their lives and less choice, which may force them to traditional therapeutic methods and suddenly can further increase the duration of illness if the diagnosis was not well done. Regarding the older generation, it appears that the effect is higher than the next two generations. When we analyze of diseases that occur in this generation, it appears that the elderly generally suffer from chronic diseases like diabetes and hypertension. Disease of the elderly may be related to natural biological phenomenon of aging of the human species. A state of old age, some cells are much more fragile and do not stand up well in the disease. The younger generation is the generation where the effect of disease duration is greater. This generation consists of relatively young people who have not yet accumulated enough wealth to deal with bad days like the occurrence of a disease that requires a lot of resources for treatment. Therefore when a long term disease attacked this generation, the risk that it could fall into poverty is high. Moreover, the unemployment phenomenon may also explain this state of affairs.

6. Conclusions

This study has helped us to determine the factors explaining the use of health services in the different generation and to measure the impact of disease duration on intergenerational poverty. The factors explaining the use of health services vary from one generation to another. Overall, the factors are the sex of the individual, level of education, the place of residence, type of water consumed its poverty level, the household size and ethnicity. It was found that when moving from the older generation (before 1954) to the younger generation (after 1978), we can see that the impact of disease duration is high in the older generation and the younger generation.

This analysis allows us to conclude that the older and younger generation is much more vulnerable to poverty when the disease duration is high. The higher is the disease duration, the higher the chances of being in a situation of vulnerability.

The impacts of the disease duration can change the life trajectory of the people and contribute to their swinging to or retention in poverty. However, the impacts differ depending on the age group involved.

These results allow exhorting to create investments in health and raising the standard of education must engage one of the largest shares of national and local budgets. The social protection programs should be established as a national priority in order to promote inclusion of vulnerable groups and rehabilitation in development. In other words invest in human capital is the safest way to respect human dignity and promote progress towards development.

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