

**HOUSEHOLDS' THERAPEUTIC BEHAVIOR: AN EMPIRICAL STUDY FOR
CÔTE D'IVOIRE**N'DA, Koffi C.¹ & AKA, Bédia F.²

Abstract

This article seeks to understand the Ivorian health policy and identify factors justifying the choice of the therapeutic route for Ivorian households. The health supply is ensured both by the public and private sectors. The health system is hierarchical with an order of precedence for the public health system. Resources are unevenly distributed in the country by focusing on the District of Abidjan. Health coverage ratios are well below international standards. The demand analysis using the discrete choice model reveals that the choice of health care provider is determined by individual and family factors, but also by elements related to their living environment, care quality indicators and the health care supply. The financing mechanism of health costs is also decisive in the choice of households.

Keywords: Human capital, health, multinomial logit, discrete choice model

JEL classification: C4; E24; J24; I1

1. Introduction

Health is an essential component of social and economic welfare. It has been long understood as arguments of educational investment in the context of the theory of human capital. It is essential for the use of labor force. However, health care in developing countries is regularly subject to various constraints. This has a negative impact on the health status and the “capabilities” of economic agents.

The demographic and Health survey (DHS-MICS, 2011-2012) reveals that life expectancy at birth in Côte d'Ivoire is around 53 years. Moreover, the infant mortality rate is 68 per thousand and the youth one is 108 per thousand. In addition, over 40% of births in 2011-2012 took place outside health facilities and only 44% of pregnant women had a normal track.

In addition, the prevalence of HIV / AIDS in Côte d'Ivoire is 4.7% for 15-49 years old with a trend towards the feminization of the disease and a higher prevalence in cities. Malaria incidence is 18% to under 5 (DHS-MICS 2011-2012 P.207). The issue of health is still generally worrying in Côte d'Ivoire. While the attendance rate of the Ivorian health facilities remains low (21% in 2000). This is partly explained by the deployment of health facilities (44% of the populations live within 5 km of a health facility, 29% to over 15 km). In 2008, 12% of the poor had no access to health facility, and 54% feet to go there (DSRP, 2009. p53).

¹ Assistant Professor, Faculty of Economics and Management, Université Jean Lorougnon Guédé; Laboratory for Analysis and Modeling of Economic Policy; Republic of Côte d'Ivoire; Email: nda.christian@gmail.com

² Professor of Economics, Faculty of Economics and Development, Laboratory for Analysis and Modeling of Economic Policy; Université Alassane Ouattara, Bouaké, Republic of Côte d'Ivoire; Email: akbdia@yahoo.fr

With this in mind, it is appropriate to consider the factors behind the demand and supply of health care in Côte d'Ivoire. In other words, what explains the choice of an economic agent and his family for a specific mode of care in case of illness?

This paper seeks to understand the Ivorian health policy and the therapeutic route for Ivorian households, in studying the deployment of healthcare resources and identifying the reasons for choosing a therapeutic route for Ivorian households.

In the rest of the article Section 2 presents the organization of the Ivorian health system. Section 3 provides a review of literature on the health capital. The methodology and data are described in section 4 while the results are presented and discussed in Section 5. Section 6 summarizes the main findings of the study.

2. Stylized facts of Supply and demand for health and Healthcare in Côte d'Ivoire

The Ivorian health system is composed of private and public structures. We distinguish essentially in the public sector, three hierarchical levels. Health facilities of first contacts (HFFC) are, normally, the gateway system. General hospitals and regional hospitals are the first benchmark with a system regulating role to prevent congestion of the upper level which consists of university Hospital Centre (UHC) and health institutes.

Private health supply can also be laminated similarly to that of the public sector with the difference that no access order is predefined. It has private infirmaries, clinics and polyclinics with technical facilities of high standard.

Public sector is the largest employer of health professionals (more than 70% of physicians and dentists) except pharmacists. Only 44% of pharmacists are employed in the public sector. Physicians working in public sector also practice in private facilities (approximately 80% of private physicians). But, human resources are still below international standards. For instance, we have one physicians for 6,459 people instead of 5,000; a midwife for 3,717 people instead of 3,000. Most of the health officials perform in the district of Abidjan. Elsewhere, there is one physician for 20,000 persons (NDP 2012-2015).

The availability of medicines in health facilities is very often used to assess the quality of the health system. However, the Public Health Pharmacy (PHP) only managed to meet 30% of demand in 2011. Moreover, immunization coverage that had reached acceptable levels (over 70%) deteriorated sharply with the destruction of infrastructure during the 2010-2011 crises. There is also the resurgence and rapid progression of diseases related to lifestyle (NDP 2012-2015)).

The financing of health care is provided by the government with the support of development partners and households through direct payments for health care. Non-governmental organizations (NGOs) also contribute to the health care delivery especially in rural areas and in the shantytowns of big cities. According to the National Health Accounts (2007-2008), the government has contributed to the total health expenditure at 13% donors 17% and households for 70%. From 2006 to 2010, only an average of 4% of state's budget was allocated to health. The operation takes up the majority of health care resources (NDP 2012-2015, P.90).

Public health facilities rate of use remains low (21% in 2008). The overall utilization rate for HFFC is 20% with regional variations. The NDP (2012-2015) justifies this by the budget constraints of households and socio-cultural barriers without neglecting the quality of services. There is also the development of self-medication and care from traditional healers. The expansion of private health centers and health insurance encourages desertion of public health centers for the benefit of private centers. There is also the diversion to the private centers of their "good patient-client" by some public sector health professionals.

As seen in Guisan and Exposito (2005) and (2016) it is of uppermost importance for Cote d'Ivoire, and for many African countries, to foster the educational level of population to improve economic development, health expenditure and life expectancy.

Guisan and Exposito (2016) estimate econometric models relating life expectancy with the educational level of population and economic development and they found positive and significant coefficients in year 2014, with a sample of 132 countries of the World, and with a sample of African countries. The educational level of population is very important because it has a direct effect on the equation and, besides, indirect effects through their positive impact on real GDP per capita.

In the following table 1 we may notice that Life expectancy of Cote d'Ivoire was very alike to African average in year 2010 and ten points higher in year 2013. While the average of 30 African countries increases only 0.9 years in Cote d'Ivoire the increase was of 9.6, in spite of a lower value of GDP per head and lower value of average years of schooling of adult population. Of course, GDP per head and schooling usually has an important positive impact on health expenditure, and life expectancy. Other circumstances also may have a positive impact.

In the case of Cote d'Ivoire there has been a decrease of real GDP per head for the period 1980-2000 (from 2233 to 1761 Dollars at 2005 prices and Purchasing Power Parities) and stagnation for the period 2000-2010 (from 1761 to 1703 Dollars at 2005 prices and Purchasing Power Parities, as seen in Guisan 2017). In spite of that Life Expectancy increased thanks to the improvement in the educational level of population and to other factors. The low values of investment per head explain the economic stagnation and thus it is very important to foster international cooperation in order to get sustainable development and more resources for health assistance.

Table 1: Life Expectancy, GDP, and total years of schooling of average adult population

	Life Exp. 1980	Life Exp. 2014	Dif. 1980- 2014	Gdp Per Head 2010	Tyr 80	Tyr 00	Tyr 10
Cote d'Ivoire	50.7	51.6	0.9	1704	1.32	2.75	3.31
Mean of 30 African countries (non weighted average)	51.4	61.0	9.6	2754	2.01	4.06	4.94

Source: Elaborated by Guisan and Exposito (2016) from World Bank and other international statistics. Life Exp. = Life Expectancy (years). GDP = Gross Domestic Product, TYR (total years of schooling of average adult population).

3. Review of the literature

The issue of health has been the focus of several studies in recent decades. Gerlter and Gaag (1990), through a multivariate statistical analysis with reference variables, concluded that price is a determining factor in the exclusion of poor people from health services in Côte d'Ivoire. The remoteness of health centers also greatly hinders their attendance. However, the study of Gerlter and Gaag (1990) ignores some variables that can significantly affect access to health care including variables relating to the quality of the health system and socio-economic and demographic characteristics of Ivorian households.

Moreover, Tiéhi (2006) concludes that general hospitals are not technically efficient in regulating the Ivorian health system. Tiéhi (2006), using the Data Envelopment Analysis (DEA) method, finds that the technical efficiency of Ivorian general hospitals is 63.7%. In addition, the score is unstable when the sample size increases. With Bootstrap DEA method, the average score is about 25%. Over the last evidence of the technical inefficiency of general hospitals, this study poses the health supply problem and its quality. Indeed, the ineffectiveness of the regulation leads to flooding of reference centers. This saturation of these institutions has negative effects on both productivity and quality of care delivered.

Wagstaff and Pradhan (2005) estimating a panel data demonstrate the positive effects of insurance on infant and maternal health and the health of adults. Insurance increases the use of health facilities by both adults and children. Informal consultations and self-medication also decrease. The direction of the change in private health spending will depend on insurance coverage. In contrast, consumption of non-medical goods will grow. Insurance reduces uncertainty in terms of access to health care capacity. Households will then invest more in other consumer goods by reducing precautionary savings. This increases transaction balances and purchase of durable goods and / or real estate.

From the perspective of demand, the economic literature highlights three theoretical models of demand for health care: the traditional neoclassical model, deriving from the human capital theory and pure demand model. The empirical tests of these models are often made using linear regression and binary regression methods (probit and logit) when the methodology incorporates qualitative variables.

The neoclassical approach to the demand for medical care is based on the principle of rational consumer who seeks to maximize his utility under constraints of his income. The sick individual operates arbitration between the various possible options for care under stress from income and other consumer goods. Health goods and other goods are substitutable. Thus, a low-cost health service encourages its request. But, an increase in income does not necessarily mean a decline in demand for health services (Newhouse, 1970). Empirical tests have been made with the multiple regression models (Andersen and Benham, 1970) and simultaneous equations (Fuchs and Kramer, 1973).

Grossman (1972) criticizes the previous model's inability to realize the health condition that is exogenous. Its indigenization would make better health adjustments. Thus, in its analysis based on the theory of human capital, "health is akin to a durable good, sustainable capital whose agent has from birth and it manages to his death." The

individual is then a consumer health care but also the producer of his health at every stage of his life (Becker, 1965). Consumption of health goods allows economic agents to produce healthy good. The medical application is independent of that of health.

The basic assumption of the model and Stoddart Barrer (1980) and Darbon (1988) is the asymmetry of information between the patient and the physician who makes the demand for care depends on the supply. Consumer choice is biased because it is relatively under informed with respect to the physician. This approach divides the demand for medical care in a pure demand which is independent to the physician and induced demand of health care.

Menahem (2000) emphasizes the consequences of the uncertainty of disease or the efficacy of medical care. For him, "the individual considers investment in health as input in the production of safety as well as the management of its risk-taking or insurance underwriting". His economic rationality requires individual to maximize both his health and his satisfaction from the consumption of other goods. He will therefore decide between health investment, insurance costs and the optimal level of risk in order to "maximize security" or "his quiet time". Health becomes a mere factor of production.

4. Methodology and data

Increasingly, qualitative variables are used extensively to analyze the behavior of economic agents in the health sector. The hegemony of qualitative variables in recent studies is explained by the fact that most databases contain information on discrete variables. Hence the use of discrete choice models (MCD) to analyze demand for health care services.

The Model

The theoretical framework that underpins the study of the determinants of health is the notion of utility maximization and health production (Mwabu et al, 1993; Sahn et al, 2003). Modeling the supplier selection of health services by a sick person or his family is specified as a discrete choice. That is to estimate the probability of selecting a treatment option among several alternatives.

Demand is defined as the probability to find different types of care conditioned by the disease based on individual characteristics, those of household and community. The model is a flexible discrete choice model (see Dow 1999). The functional form of the model is the utility function of Akin et al. (1984) and Mwabu et al., (1993). Sahn et al. (2003) formalizes the utility that earns a person by choosing a particular option of care by:

$$V_j = f(y - P_j) + Q(X, Z_j) + \varepsilon_j \quad (1)$$

The utility depends of net income $(y - P_j)$ after payment of care option j. X represents the individual characteristics (or characteristics of households) invariant regardless of the option chosen. Z_i is defined as the specific variables refers to selection j. $Q(X, Z_j)$ refers to the quality of the option j and depends on the choice, characteristics of the individual and of the applicant household. The quality function is linear in the variables X and Z. Variable X takes into account the individual

characteristics, the characteristics of households and contextual figures. The coefficients of variables may vary depending on the chosen treatment option. Z_j are specific variables to each care option measuring its quality (Sahn et al, 2003). The utility function of used by Sahn et al. (2003) is a semi-quadratic function that is linear in health and quadratic in consumption of other goods and services:

$$f(y - P_j) = \delta_1 \log(y - P_j) + \delta_2 [\log(y - P_j)]^2 \quad (2)$$

The parameters δ_s are assumed to be identical for all health service provision options. This requires the marginal utility of income to be the same for all options. As in other discrete choice models, the logit model is then applied. We try to identify the difference in health services ($V_i - V_o$); where V_o is the basic category associated with the health facility.

Normalizing the quality of healthcare to zero and approximating the utility function by:

$$\begin{aligned} f(y - P_j) &= \delta_1 \log(y - P_j) + \delta_2 [\log(y - P_j)]^2 \\ f(y - P_j) &= \delta_1 \left[\log(y) + \log\left(1 - \frac{P_j}{y}\right) \right] + \delta_2 \left[\log(y) + \log\left(1 - \frac{P_j}{y}\right) \right]^2 \\ f(y - P_j) &= \delta_1 \left[\log(y) - \frac{P_j}{y} \right] + \delta_2 \left[\log(y)^2 - 2 \log(y) \left(\frac{P_j}{y} \right) \right] \end{aligned} \quad (3)$$

$\log(y)$ and its square are assumed to be constant across all health care provider options. By taking into account differences in health services, we can write:

$$V_j - V_o = \delta_1 \left(-\frac{P_j}{y} \right) - \delta_2 \left[2 \log(y) \left(\frac{P_j}{y} \right) \right] \quad (4)$$

Dow (1996a) identifies a number of concerns with this specification and offers a “flexible model of behavior” as an alternative:

$$V_j^* = \alpha_{0j} + \alpha_{1j}N + \alpha_{2j}M + \alpha_{3j}T + \alpha_{4j}Z + \alpha_{5j}P_j + \alpha_{6j}P_j^2 + \alpha_{7j}P_j y + \alpha_{8j}y + \alpha_{9j}P_k + \alpha_{10j}t + \alpha_{11j}w + \varepsilon_j \quad (5)$$

In this specification the coefficients of the variables of price and income are allowed to vary according to different alternatives. Then, we can relax the assumption of additive separability of the utility function. That is why Akin et al. (1998) use the first specification rather than equation (4).

The functional form of the model requires the use of basic multinomial logit model. The dependent variable is the choice of health care provider and the various alternatives available. The independent variables are the characteristics of the individual, household and community and variables relating to the quality of care.

Empirical experiments revealed that the flexible multinomial logit model is relatively robust, to the extent that "the property of the alternative relative independence is theoretically plausible since the adjustments were well made or the

predictions are accurate" (McFadden, 1984). In addition, this model is easier to compute. However, the interpretation of the coefficients obtained from the flexible multinomial logit model is complicated because of its non-linearity in the explanatory variables. In this case, the best approach is to interpret the marginal effects and the predicted probabilities. The marginal effect can be materialized with the multinomial logit model as follows:

$$\frac{\delta \text{Prob}(V_K = 1)}{\delta X} = \text{Prob}(V_K = 1) \left[\alpha_{K,x} - \sum_{j=1}^J \alpha_{j,x} \text{Prob}(V_j = 1) \right] \quad (6)$$

Where the parameters $\alpha_{j,x}$ are specific coefficients associated to the variables X. Therefore, the marginal effect depends on the values of all independent variables and coefficients of each result.

The predicted probabilities can be obtained in two ways. First, they can be calculated for each individual as we know the values of the independent variables. The predicted probability that individual i chooses alternative K is:

$$\text{Prob}(V_K = 1) = \frac{\exp(\hat{V}_K^*)}{\sum_{j=1}^J \exp(\hat{V}_j^*)} \quad (7)$$

With $\hat{V}^*$ the predicted conditional utility for individual (I) given the exogenous variables. The second way is to calculate the probabilities predicted by keeping constant all other exogenous variables except the variable of interest. Using these models allows testing the hypothesis that the demand for care varies with education, socio-demographic, income, quality and relevance of services provided.

The data and the variables

We use data from surveys on the living standard of Ivorian households (ENVV98 and ENV2008) of the National Institute of Statistics. They provide information on the characteristics of households and their members and their living environment. Individuals can be located in a household and also be linked to a department. They reflect the socio-economic and demographic context of the household. The ENV98 account 4,200 households for 24,594 individuals and ENV2008 has 12,600 households and 59,699 individuals.

The choice of health care provider is the dependent variable. Five choice options are considered, namely: self-medication (all prescriptions outside of a licensed health facility for this purpose), traditional healers (traditional warriors and contractor), health facilities of first contacts (HFFC) (centers community-based health clinics, dispensaries, maternity), reference institutions (general and regional hospitals, university hospitals and health institutes) and clinical (all private health facilities regardless of size).

The explanatory variables are related to the individual, the household, and the socio-economic and demographic characteristics. The selected individual

characteristics are age, gender, level of education and per capita income. Age and income per capita are continuous variables. Gender is a dichotomous variable that takes the value one (1) for the male and zero (0) to the female. Education is a dummy variable which describes the highest level of education. The nature of the disease is captured by its duration and the cost of care is taken into account as "proxy" variable for the quality of care (see Alderman and Lavy, 1996, Akin et al, 1995).

5. Empirical Results

The preference for a care package option depends on individual elements, socio-demographic and economic characteristics of the household and certain elements relating to residence, provision of care and nature of the disease. The estimations results are summarized in Table 2.

- *The age of the individual patient*

Age is less decisive in the choice of health care provider. Indeed, depending on the time, the influence of age in the choice of health care provider is different. In 1998, the age is decisive for the choice of health facilities of first contacts and clinics. However, if the age is positively correlated with the choice of health facilities of first contact, it is inversely related clinics.

Thus, the more the person is, least he is willing to seek care from clinics. These results are very similar to those of Kaija and Okwi (2011) concerning the demand for health care of Ugandan households. A unit change in age will increase the relative risk ratio of 1.07 for HFFC and decrease that of 0.933 for clinics. But in 2008, age had a significant positive effect on the demand for care from traditional healers, health facilities of first contacts (HFFC) with relative risk ratios of 1.26 and 1.08 respectively for traditional healers and the HFFC.

Table 2: care provider choice by level of education of parents

ENV98						
	Illiterate	Primary	Secondary I	Secondary II	Tertiary	Whole
Self-med.	52.82	42.62	48.44	29.41	33.22	49.01
Tradi. Med.	7.21	7.97	3.26	3.38	5.37	5.59
HFFC	9.19	7.46	8.17	12.94	18.46	12.6
Ref. H. inst.	24.89	31.51	26.64	32.79	21.81	24.45
Clinics	5.89	10.45	13.49	21.47	21.14	8.34
Total	100.00	100.00	100.00	100.00	100.00	100.00
ENV2008						
	Illiterate	Primary	Secondary I	Secondary II	Tertiary	Whole
Self-med.	10.63	6.98	18.35	10.34	12.50	10.71
Tradi. Med.	13.08	8.42	1.10	8.87	1.32	12.73
HFFC	22.49	23.82	22.20	3.45	17.76	22.36
Re. H. inst.	39.33	49.08	38.53	67.49	63.82	39.75
clinics	14.47	11.70	19.82	9.85	4.61	14.45
Total	100.00	100.00	100.00	100.00	100.00	100.00

Choice of health care supplier based on the area of residence

ENV98											
	Abj.	Daloa	Khgo	Boua	Aben	Man	Yakr	Bond	SPed	Odien	
Self-med.	42.81	52.51	66.26	41.31	56.03	52.99	55.42	83.33	32.04	61.35	
Trad.Med.	6.41	4.55	1.13	8.66	0.47	5.46	3.94	10	1.8	7.21	
HFEC	13.65	9.35	12	12.15	31.91	15.44	5.42	3.89	5.39	17.25	
Ref.H. ins	24.24	28.37	19.38	26.2	11.58	22.98	30.97	2.78	44.91	13.97	
Clinics	12.9	5.22	1.23	11.69	0	3.12	4.24	0	15.87	0.22	
ENV2008											
	Abj.	C.N.	C.W.	N.E.	North	West	South	S.W.	Center	C.E.	N.E.
Self-med.	15.53	12.7	6.89	19.69	7.19	6.66	9.42	9.47	4.71	5.84	6.16
Tradi.Med.	6.58	21.4	13.78	10.31	24.05	21.09	6.52	7.04	10.35	9.14	32.54
HFEC	20.38	16.66	29.04	21.08	19.8	17.83	25.98	20.39	27.29	37.03	14.69
Ref.H.Inst.	28.02	38.14	42.85	42.73	38.04	50.54	47.56	37.26	49.53	38.86	38.9
Clinics	29.5	11.11	7.45	6.19	10.92	3.87	10.53	25.85	8.12	9.14	7.71

Choice of health care supplier based on the socio-professional category

ENV98									
	Coffee cocoa	Export Prod.	Prod starchy	other F.crops	Public Empl.	Private Empl	Liberal Profes.	Agric Work.	Unempl.
Slef-Med.	48.45	45.67	65.81	60	37.77	41.82	45.82	56.78	51.14
Tradi. Med	7.16	2.41	7.00	7.25	3.78	4.16	7.26	1.69	4.76
HFEC	12.58	19.11	9.65	18.48	24.64	13.12	10.68	10.49	8.57
Ref. H. Inst	26.91	32.39	16.03	11.58	27.16	27.13	23.79	25.21	26.74
Clinics	4.89	0.4	1.51	2.69	6.65	13.76	12.45	5.83	8.79
ENV2008									
	Home-makers	Agricul.	Public Empl.	Private Empl.	Liberal Profes.	Agric Work.	Unempl		
Self. med.	11.37	8.77	11.67	12.83	8.58	22.41	11.76		
Tradi. med.	14.02	18.89	2.22	7.61	12.43	9.33	9.21		
HFEC	29.11	33.35	17.87	19.08	16.68	28.89	15.75		
Ref. H. Inst.	33.96	32.89	51.48	40.47	45.00	25.91	41.98		
Clinics	11.53	6.10	16.77	20.00	17.30	13.47	21.31		

Source: Author with data from ENV98 and ENV2008.

- The gender of the household head*

Compared to male, the female gender is negatively correlated with the demand for care from traditional healers. Concerning clinics, correlation with health care demand expressed by women changes from negative to positive from 1998 to 2008.

The relative risks ratios are 0.654 and 0.358 respectively for traditional healers and clinics in 1998 against 1.67 for clinics in 2008. Compared to men, women are less likely to seek care from traditional healers in the presence of self-medication. This aversion is greater for traditional healers (0.664) than clinics (0.360). But in 2008, the female gender has opted overwhelmingly for care in clinics (1.67).

- *Education*

Education is negatively correlated with the provision of care by traditional practitioners. So, the more you are educated the less you are encouraged to seek care delivered by traditional practitioners. People who have with secondary education tend to avoid the centers of first contact in the presence of self-medication. But, people with high level of education require care in HFFC. Education also motivates the demand for care in the reference institutions. But when the education level rises, reference institutions are not primarily sought.

In relative terms, in 1998, a unit increase in the level of education will have relative risk ratios of 0.137 and 0.313 in the context of traditional medicine respectively for secondary. At the HFFC we have 0.475 for the primary education and 0.315 for secondary I. Statistics on reference institutions are 1.560 and 0.451 for the primary to the secondary I. For clinics, relative risks ratios are 2.027 for the primary education and 3.656 for the secondary II.

However, concerning the demand for care in the HFFC and reference institutions, the secondary level is not favorable in presence of self-medication in 2008. The relative risks ratios are 0.108 and 0.009 respectively for HFFC and references institutions. The primary education is positively correlated with the choice of reference facilities while the secondary is negatively related to the choice of reference institutions. More individuals have high levels of education better his therapeutic itinerary respects the hierarchy of the health pyramid. They go to reference centers for emergencies and specialized cares.

- *Marital status and religion*

Taking the status of “married” as reference, we tried to understand the influence of marital status of the Head of household on choosing a care provider for a household member. The main findings show that marital status is important in choosing an institution of reference or a clinic for care. The status of “single” is positively related to the demand for care in clinics in 1998. On the other hand, in 2008, the “separated or divorced” favored care from a traditional healer and fleeing the clinical benefit of self-medication. People whose status is “never married singles” prefer self-medication to the others care delivery options.

There is a positive influence of religions other than Christianity and Islam on the choice of traditional medicine and references facilities but a negative connection between these religions and the choice of HFFC and clinics. There is also a positive relationship between Islam and the choice of reference institutions. Religion can therefore influence the preference for one kind of care giving.

- *Duration of illness*

When illness tends to last, people tend to turn to traditional medicine and reference institutions. Health facilities of first contacts and clinics are then abandoned. This result is stackable to those Kaija and Okwi (2011) in Uganda and Sahn et al (2003) in Tanzania.

Indeed, when the time is extended illness individuals seeking specialized care and high levels. This increases the demand for the services of the centers of highest

levels and specialized institutes. These treatments are not often accessed by many people in private clinics with technical facilities of high standard. This reduces the demand for services of this type of provider. Moreover, after trying the modern health care many people are opting for traditional care when the disease continues. Hence there is a positive link between disease duration and care demand from traditional healers.

- *Socio-professional category (SPC)*

The social and professional status also determines the type of provider to be selected. So regarding traditional medicine, it is clear that only public sector employees and the Liberals flocked there in 1998. They were joined by non-active persons in 2008. Food crops producers resist using traditional medicine. At the HFFC, only public employees are massively flocked. In 2008, farmers were also using HFFC unlike agricultural employees who are away from it. Almost all socio-professional categories demand care provided by references institutions. Only the producers of starchy food crops do not request care in these institutions. Moreover, people of liberal professions are those who are oriented more towards clinics. They are followed by farmers.

In fact, public and private employees are covered by insurance that allow them to access care at reduced costs. Also, the functioning of these insurances required in many cases that the prescriber has a certain quality to validate support, hence their preference for referral facilities.

- *Household income*

Household income is not very decisive in explaining his behavior therapy. When the household income increases, there is a greater propensity for self-medication. The household's income is also positively linked to demand care from traditional providers. Most people with relatively high levels of income subscribe to insurance policies. This makes their income less relevant to their consumption of health services.

- *Accessibility to health facilities*

Improved transport services negatively impact the demand for health care from traditional healers and reference institutions. In addition, the distance discourages the demand for care in the HFFC unlike the time. Both times and distance discourage the demand for care in the references institutions. Households prefer to wait for a relatively long time to access to cares in a HFFC than traveling long distances to join reference health institutions.

- *Cost indicators*

The health costs consist of direct costs for care (consultation, medical tests) and indirect costs of the illness and its treatment (transport, accommodation costs). Direct costs of modern medicine negatively influence the demand for care from traditional healers while they are positively correlated with the choice of the HFFC, reference institutions and clinics. However, indirect costs discourage the demand for care regardless supply option. Most of references centers and clinics with high technical level are located in large cities. Evacuation and boarding of patients in these facilities often charge exorbitant amounts which increase the total cost of care.

But, the pricing of care does not affect negatively the demand of care in formal health facilities by Ivorian households. Instead, it advocates for the demand of health care in these structures. This is the result of two effects. Indeed, the price of health care is often presented as an indicator of their quality. This could encourage more households to seek care whose quality has improved. However, pricing may exclude certain strata of the services offered in these health centers (Vogel, 1991). People excluded from public health centers because of funding disability cannot use the paid services of clinics. Then, it develops irrational and risky treatment modes (Withehead et al, 2003; Nyamator and Kutzin 1999). In addition to direct health costs, indirect costs are another factor that could curb demand (Gertler Gaag, 1988; Mwabu 1986).

The positive relationship between pricing and demand for care in reference facilities and clinics can be justified by the quality of care provided in these centers. As long as the value of service and health care for which the user has to pay is considered higher than the alternative option available to him, he will continue to pay for them.

The imposition of costs in public hospitals is only justified if the care in these centers and funded by the user have a higher value than health services that the user might have in the private sector (Duff, 2004). In fact, prices did not constitute a real obstacle to the demand for health care services when these are of quality (Akin et al, 1984). Reference institutions are known for the treatment for severity affections. So the user is aware that he will pay for his care to recover healing.

In addition a positive connection exists between the direct costs of traditional medicine and all health supply options. Thus, the rising cost of treatment in traditional medicine will increase the demand for care from formal structures of health care but does not cancel the demand for care from traditional healers. Those for whom the price level of the traditional medicine is proportional to its quality will not depart.

• *Medical cover*

Insurance and health assistants are positively correlated with all conventional health care and service provision options. In fact, having insurance motivates the individual to attend the formal health facilities in case of need. The likelihood of being denied access to a service for failure to pay becomes almost zero.

• *Regional Characteristics*

The place of residence may influence the choice of health care provider. Thus, we see that people living in Daloa region prefer self-medication to other aid supplies options. Regarding the use of health facilities of first contact, only areas of Bouaké and Abengourou maintain a positive relationship with the option of health service delivery there. References institutions are solicited in Bouaké and San Pedro unlike the regions of Korhogo, Abengourou, Yamoussoukro and Bondoukou. Clinics are also less demanded in the regions of Daloa, Korhogo, Bouaké, Man and Yamoussoukro.

In short, the choice of health care provider is determined by individual factors, but also by community factors and health care quality indicators. In addition, the financing of the costs of health care and services is a key determinant of household behavior in the choice of care provider.

5. Conclusion

The organization of the Ivorian public health system is a pyramid with a base made up of health facilities of first contact. General hospitals and regional hospital centers have the role of regulating access to the top of the pyramid where the university hospitals and institutes are located. The Ivorian public health supply imbalances with ratios below international standards. Choosing a care option by a person and / or his family takes into account several parameters concerning individual and / or his family, such as age, gender, marital status, religion, disease duration, the level of education and occupational status. The indicators on the community and the quality of care concern the place of living, the cost of health care and services and financing of these health expenditures.

Our results show that medical coverage whether public and / or private can increase the rate of using modern health facilities at all levels of the health pyramid and reduce the practice of self-medication and the use of care from traditional healers. So the universal health insurance project launched by the State of Côte d'Ivoire is likely to enable the Ivorian households to heal better. However, we should not forget the indirect costs related to access to care that explain much of the desertion of formal health centers. Defection of requesting care in formal centers is amplified by the distance and minimum time to reach a center or receive care. It would be desirable that universal health coverage puts an emphasis on access to care by improving not only the supply but also the quality of care and health services to eliminate various additional costs.

Bibliography

- Akin, J., Griffin, S. C., Guilkey, D. K. and Popkin, B. M. (1984), *The Demand for Primary Health Care in Developing Countries*, Totowa, NJ, Littlefield, Adams.
- Akin, J.S, C.C Griffin, D.K.Guilkey, and B.M. Popkin, (1986); The demand for adult outpatient services in the Bicol region of the Philippines; *Social Science and Medicine* 22 (3): 321-328.
- Akin, J.S., Guilkey D.K. and Denton E.H. (1995); Quality of services and demand for Health care in Nigeria. A Multinomial Probit Estimation; *Social Science and Medicine*, Vol.40, N°11, PP. 1526-1537.
- Akin, J.S., Guilkey, D.K., Hutchinson, P. and McIntosh, M. (1998); Price elasticities of demand for curative health care with control for sample selectivity on endogenous illness: An analysis for Sri Lanka; *Health Economics*, Vol. 7, No. 6, pp. 509-531.
- Akin, J., Hutchinson, P. and Strumpf, K. (2001); Decentralization and Government Provision of Public Goods: The Public Health Sector in Uganda. World Bank, Working Paper.
- Alderman, H. and Lavy, V. (1996); Household responses to public health services: Cost and Quality Tradeoffs; *World Bank Research Observer*, Vol.11, No.1, pp. 3-22.

- Andersen R. and Benham L. (1970), Factors affecting the relationship between family income and medical care consumption, in: Klarman H.E., *Empirical studies in Health Economics, Proceedings of the second conference of the economics of health*, The John Hopkins Press.
- Audibert M. and de Roodenbeke E. (2005), Utilisation des services de santé de premier niveau au Mali : *Analyse de la situation et perspectives*, Banque Mondiale, Document de travail, avril 2005.
- Cissé B., Luchini S. and Moatti J-P (2004), Recouvrement des coûts et demande de soins dans les PED. In: Revue française d'économie. Volume 18 N°4, 2004. pp. 111-149.
- Dow W.H. (1999), Flexible discrete choice demand models consistent with utility maximization: An application to health care demand. *American Journal of Agricultural Economics*, Vol. 81 (August 1999), pp. 680-685.
- Dow W.H. (1996a). Discrete Choice Estimation of Price-elasticities: The benefits of a flexible behaviour model of health care demand.
- Dow, W.H. (1996b). Unconditional Demand for Health Care in Cote d'Ivoire: Does Selection of Health Status Matter? Living Standards Measurement Study, Working paper N°127.
- Duff, D. G. (2004). Benefit Taxes and User Fees in Theory and Practice, *The University of Toronto Law Journal*, 54, 391-447.
- Fuchs, V. R. and Kramer M. J., (1973), Differences over time 1948-1968; NBER Chapters. in: *Determinants of Expenditures for Physicians' Services in the United States*, National Bureau of Economic Research, Inc, PP. 5-20.
- Gertler, P. and J. V. der Gaag (1990), *The Willingness to Pay for Medical Care: Evidence from Two Developing Countries*; Baltimore and London: Johns Hopkins University press for the World Bank.
- Gertler, P. and Van Der Gaag, J. (1988), *Measuring the willingness to pay for social services in developing countries*, World Bank, Washington, DC, USA
- Gertler P., Dor A., and V. der Gaag, J. (1987). Non-price rationing and the choice of medical care providers in rural Cote d'Ivoire. *Journal of Health Economics*, Vol. 6, pp. 291-304.
- Grossman M. (1972a), *The demand for health: a theoretical and empirical investigation*, NBER, New York.
- Grossman M. (1972b), On the concept of health capital and the demand for health, *Journal of Political Economy* 80 (2), PP. 223-255.
- Guisan, M.C., Exposito, P. (2005). Human capital and Economic Development in Africa: An Econometric Analysis for 1950-2002. *Applied Econometrics and International Development*, Vol. 5-2. Downloadable at Ideas. Repec.

- Guisan, M.C. (2017). *Manufacturing and Development in Countries and Areas of Africa, 2000-2010*, Regional and Sectoral Economic Studies, Vol. 17-2. Downloadable at Ideas. Repec.
- Guisan, M.C., Exposito, P. (2016). "Life Expectancy, Education and Development in African Countries 1980-2014: Improvements and International Comparisons", *Applied Econometrics and International Development*, Vol. 16-2. Downloadable at Ideas. Repec.
- Kaija D. and P. O. Okwi (2011), Quality and demand of health care in rural Uganda: evidence from 2002/2003 Household survey, Research Paper (RP 214), African Economic Research Consortium (AERC), Nairobi, janvier 2011.
- Lavy V. and Germain J. (1990), Tradeoffs in cost, quality and accessibility in the utilization of health facilities: Insights from Ghana.
- Litvack J. and Bodart, C. (1993), User fees plus quality equals improve access to health care: results of a field experiment in Cameroon; *Social Science and Medicine*, Vol. 37, pp. 369-383.
- McFadden, D. (1984), *Econometric Analysis of Qualitative Response Models*. In *Handbook of Econometrics*, ed. Z. Griliches and M.D. Intriligator: Elsevier Science Publishers.
- McFadden, D. (1981) "Econometric Models of probabilistic choice", in Manski, C. and McFadden, D. (eds). *Structural Analysis of Discrete Data: With Econometric Applications*, MIT Press, Cambridge MA, pp. 198-272.
- Menahem G. (2000), *Demande de santé ou Demande de Sécurité: deux modèles pour la santé en économie*, March 2000.
- Mwabu, G. (1986), Health care decisions at household level: Results of health survey in Kenya, *Social Science and Medicine*; Vol. 22, No.3, pp. 313-319.
- Mwabu, G.M., Ainsworth and Nyamete, A. (1993), Quality of Medical care and choice of medical treatment in Kenya, *The Journal of Human Resources*, Vol. 28, N°4, pp. 838-862.
- Mwabu, G. (1986), Health Care Decisions at the Household Level: Results of a Rural Health Survey in Kenya. *Social Science and Medicine*, 22, 315-319.
- Newhouse J. P. (1970), Toward a Theory of Nonprofit Institutions: An Economic Model of a Hospital, *The American Economic Review*, Vol. 60, No. 1 (1970), pp. 64-74.
- Nyanator, F. and Kutzin, J. (1999), Health for some? The effects of user fees in the Volta Region of Ghana; *Health Policy and Planning*, 14, 329-341.
- Sahn, D.E, S.D. Younger, S.D. and G. Genicot (2003), The Demand for Health Care Services in Rural Tanzania, *Oxford Bulletin of Economics and Statistics*, 65, 2.
- Tiehi T. N. (2006), Production de soins de santé dans les hôpitaux généraux publics en Côte d'Ivoire: une évaluation de l'efficacité technique, *Revue Ivoirienne des Sciences Economiques et Gestion (RISEG)*, vol.10, n°2-2006, PP.39-55.

- Vogel, R. J. (1991), Cost Recovery in the Health-Care Sector in Sub-Saharan Africa; *International Journal of Health Planning and Management* 6, 167-191.
- Wagstaff A. and Pradhan M. (2005), Health Insurance Impacts on Health and Nonmedical Consumption in a Developing Country, *World Bank Policy Research Working Paper* 3563.
- Whitehead, M., Dahigren, G. and Evans, T. (2003), Equity and health sector reforms: can low-income countries escape the medical poverty trap? *The Lancet* 358, 833-836.