Ethnicity and prenatal care use in Ouagadougou
The independent contribution of neighbourhood ethnic composition

Abdramane B. SOURA

Institut Supérieur des Sciences de la Population

Ouagadougou, Burkina Faso

e-mail : bassiahi@hotmail.com

Introduction

In the field of public health, the Health Belief Model considers that the intention to use a health service is primarily borrowed from the user's beliefs and perceptions. These beliefs may be influenced by cultural factors, such as ethnicity. However, this impact is often difficult to see in urban areas because the city appears to be a melting pot where different cultures materialized by their ethnicity come to merge and create a new type of community where ethnic group would lose its role as a discriminating factor of health behaviour (Baya 1993). With our interest in Ouagadougou (capital of Burkina Faso), we would like to refute this latter conception. The purpose here is to highlight the importance of ethnic group in terms of health behaviour in an African city, especially in terms of prenatal care use during pregnancy. Moreover, we try to demonstrate that beyond the influence exerted by the woman's own ethnic group, there is an independent contribution of the neighbourhood ethnic composition on the probability of the pregnant woman to use early antenatal visit.

The paper is divided into three sections. The first one is related to the literature review. The importance of ethnicity in terms of antenatal visit and delivery is theoretically presented. Moreover, the influence of other controlling factors is also debated. The second section concerns data and methods and the third one is related to principal results.

1. Some theoretical considerations.

The importance of ethnicity in obstetric care in Africa

While in most African societies, it is assumed that pregnancy is the result of mating between man and woman, it also believes that its occurrence is possible only through the will of divine forces (Béninguissé 2003). Pregnancy is regarded as a process towards the realization of the reproductive function entrusted to the woman by her ancestors. According to Ewombé Moundo (1991, quoted by Béninguissé et al. 2004), that spiritual concept promotes the initiation of therapy consisting of preventive care and various rituals, prohibitions and requirements of food and behaviour whose purpose is to ensure a successful outcome of pregnancy and the birth of a child free from any physical or mental defect . In Cameroonian ethnic groups for example, the first trimester of pregnancy is characterized by large discretion on behalf of the women because she must not anticipate divine will or spirits and ancestors will on a pregnancy still uncertain (Béninguissé 2003).

This same idea exists in Burkina Faso. In the traditional Mossi example, it is considered that procreation is the result of penetration of a spirit called Kinkirga in the womb of the woman

when she has sex with her husband (Bonnet 1988). In early pregnancy, the Mossi pregnant woman should be discreet, as discretion is bound up with some religious cosmology:

"*We must avoid offending the spirits who participated in the pregnancy. By caprice or malice, they have opportunity to "spoil" that pregnancy by picking it off the womb. The woman does not even express her satisfaction to be pregnant. The genius inside her could be extremely strict and punish her by moving out. We must not shout too soon [...] a victory which remains very uncertain given the capricious nature recognized in "kinkirga" which is in the womb and may at any time and for nothing move out*" (Badini 1977 quoted by Bonnet 1988, p.32).

These beliefs can prevent the early use of prenatal care. They are not specific to the Mossi ethnic group. An informal interview conducted with some women from different ethnic groups (Dagari, Samo, Gourounsi, ...) found in their respective cultures, the existence of taboos to be observed by pregnant women. In the Dagari example, a woman who suspects that she is pregnant must undergo a rite before giving this information to people who are not members of her family. She must inform the oldest woman in her family who will sprinkle her with water collected in a little pot. This pot should be hidden somewhere until delivery. According to their conception, if this ceremony is not completed, the pregnancy is at risk of miscarriage. In the Samo ethnic group, it is true that pregnancy must not necessarily be discreet, but there are some taboos. For example, the pregnant woman should not enter some forests. As in the Samo group, the Gourounsi woman is not necessarily required to hide her pregnancy, but she is subject to other prohibitions. She should avoid, for example, washing late at night.

With regard to empirical works, some papers (Pebley et al. 1996; Celik and Hotchkiss 2000; Baya 1993) have highlighted the influence of woman's ethnic group on her propensity to use obstetric services during pregnancy. Thus, in Guatemala, the Indigenous (Indian Latin American) would be less likely to use a prenatal visit during pregnancy compared with Ladino women (Pebley et al. 1996). In Turkey, Kurdish women are less likely to have an antenatal visit, compared to other women (Celik and Hotchkiss 2000). In Bobo-Dioulasso (Burkina Faso), Mossi and Fulani mothers also tend to use late prenatal care (after 4 months of gestation), compared with women from other ethnicities (Baya 1993). In all these examples, the influence of education and standard of living (or other economic characteristics related to standard of living) has been controlled.

Beyond this effect of ethnicity at the individual level, the neighbourhood ethnic composition can also affect individual health behaviour. This influence is largely linked to the diffusion process, especially of norms and beliefs about the origin of diseases and therapies to use. These beliefs depend on culture, which in turn depends largely on ethnicity, and residential proximity facilitates culture sharing (Leclere et al. 1997, Retherford and Palmore 1983; Levitt 1998). The spread of beliefs and health behaviours depend on the degree of cultural homogeneity. The higher the latter is, the faster is the diffusion process (Retherford and Palmore 1983). Thus, it is possible that in some neighbourhoods, standards and health behaviours of the most representative ethnic group become the reference, espoused by people belonging to less representative ethnic groups. This effect can also be linked to the issue of social control, which actually refers to all social arrangements (whether formal or informal), aimed to regulate individual behaviours so that they respond to social norms (Lianos 2003). As a result, some people tend to obey the norms and cultural values prevailing in the locality, either consciously because they understand these standards and adhere to them, or simply because they want to preserve good acquaintances with the majority. If the prevailing view in

the neighbourhood is such that the first months of pregnancy must be characterized by a strong discretion, some pregnant women might submit to this rule without being really convinced, but simply because they want to avoid stigmatization.

From the empirical perspective, papers that have already highlighted the contextual influence of ethnicity on health behaviour are very rare, especially in regards to developing countries. One of the few examples in the domain of maternal health in particular is the work of Pebley et al. (1996) which showed that in Guatemala, the ethnic composition of the municipality has a significant effect on health service use during pregnancy and delivery. From a multilevel analysis, they noted that, regardless of their own ethnic group, women who live in the municipalities most populated by natives are less likely to use modern prenatal care or to use health facilities for delivery.

Other controlling factors

In addition to ethnicity, empirical studies have shown that a number of other factors can influence prenatal care use. Among them, those which have been taken into account in this paper are pregnancy status (desirability), birth order, age of mother, residence duration in the city, education level, marital status, religion and standard of living. At the contextual level, education, health facilities and standard of living were also considered in addition to ethnic composition.

Regarding pregnancy status (desirability), it seems that some women tend to take less care of unwanted pregnancies. Birth order is regarded as an approximation of pregnancy order and the generally accepted hypothesis is that, lacking prior experience in terms of symptoms of pregnancy and birthing process, primigravida women may ignore the risks related to gestation and therefore use less maternal health services (LeGrand and Mbacke 1993; Gage 1998). This view is however contrary to the results found by several other authors who have produced a negative relationship between birth (or pregnancy) order and use of health services during pregnancy: Elo (1992) in Peru, LeGrand Mbacke (1993) in Bamako (Mali) and Bobo-Dioulasso (Burkina Faso), Celik and Hotchkiss (2000) in Turkey, Navaneetham and Dharmalingam (2002) in India, Nkurunziza (2007) in Burundi. The probability of using maternal health services may therefore be higher in the case of senior births related mainly to the fact that women know that first pregnancies usually involve more risk and, therefore, tend to use maternal health care more frequently (Bhatia and Cleland 1995; Celik and Hotchkiss 2000). It is also possible that, controlling for other factors, antenatal care seems less necessary in the view of some multiparous women, in particular because they have already acquired knowledge and experience during previous pregnancies (Bhatia and Cleland 1995 ; Celik and Hotchkiss 2000).

In general, the relationship between mother's age and maternal health service use is derived from that of the birth order. It is considered that the younger women (especially teenagers) who are often at the first pregnancy lack experience and are generally less mature psychologically and less stable emotionally. This can lead to under-utilization of maternal health services (Mohamed et al. 1989, quoted by Gage 1998; LeGrand and Mbacke 1993). But it should be noted that as in the case of birth order, mother's age can maintain a negative relationship with maternal care use, related mainly to the fact that older mothers are also those who generally have higher parities (Bhatia and Cleland 1995; Celik and Hotchkiss 2000). Moreover, as we have just noted, they are generally less educated and less open to modernity (cohort effect).

Regarding other maternal characteristics (marital status, residence duration in the city, standard of living, education, religion), many studies indicate an underutilization of maternal health services by unmarried women (Essex et al. 1992; LeGrand and Mbacke 1993; Gage 1998, Magadi et al. 2000; Mekonnen and Mekonnen 2003). The influence of residence duration in the city on health service use stems from the problems of urban integration of migrants. Indeed, the health service utilization is often low among recent rural-urban migrants because they may not know where to find appropriate care or because they may have less favourable health attitudes. By conditioning financial capacities to support medical expenses, a low standard of living could preclude women to use health services during pregnancy or to have less respect for "standards" of pregnancy medical monitoring. As a way of exposure to Western culture, formal education is also a factor of modern health care utilization, which has rarely been challenged (Kroeger 1983, quoted by Fournier and Haddad 1995). We therefore consider that educated women know more about risks associated with pregnancy and are more conducive to modern medicine. Regarding religion, its influence on health behaviour is related to the fact that it is a set of values and norms that govern the lives, beliefs and behaviours of individuals. In sub-Saharan Africa in particular, Akoto (1990) noted that it is difficult to separate Christianity from Western lifestyle since its release on the continent was linked to that of the West. Historical links therefore exist between Christianity and African Christians health behaviour. Regarding place of delivery, it appears that the first Christian missionaries incited their followers (sometimes with the threat of being excommunicated) to give birth at the hospital or clinic (they were often the proprietors) and abandon all the traditional rites surrounding the birth of a child (Akoto 1990). At several places, this practice became so deeply rooted so as to become the norm (Akoto 1990).

With regard to neighbourhood factors taken into account, note first the importance of health service accessibility, since its underutilization could be explained by its insufficiency (Fournier and Haddad 1995). The influence of contextual education and that of the contextual standard of living are primarily related to the diffusion process. Thus, because of the fact that educated women generally use more modern services, we would expect a stronger tendency of uneducated women to use maternal health services in the most educated districts, compared to their counterparts in less educated districts, all things being equal. Similarly, due to the fact that richer people tend to have better health behaviour, we could observe that the poorest women use more prenatal care in the richest neighbourhoods (high standard of living) compared to their counterparts in the poorest neighbourhoods, all things being equal.

2. Data and methods

The study focuses on the number of prenatal visits and the timeliness of the first prenatal visit with 1998 and 2003 DHS data. It covers all births since 1993 in the 1998 DHS and all births since 1998 in the 2003 DHS. To avoid problems of small numbers, we chose to combine the two data bases, adding observations and recalculating new weighting coefficients based on the sampling procedure used, in order to have representativeness. This type of merging is based on the assumption of low residential mobility between surveys. We therefore consider as a working hypothesis that at the census cluster level, women who have moved or died between 1998 and 2003 have been replaced by other women with similar social characteristics.

Initially, there was a total of 865 births. But, given the presence among our objectives, identification of neighbourhood effects, it seemed logical to avoid, or at least to limit the effect of prenatal behaviour that occurred outside Ouagadougou. Thus, births for which the

pregnancy was conceived before the mother's arrival in Ouagadougou (131 children in total) were excluded from our analysis. Furthermore, missing values for both dependent variables resulted in a further reduction in sample size. The final sample included 649 births that were analyzed for the timeliness of the first antenatal visit and 643 that were analyzed regarding the number of prenatal visits during pregnancy. There are 62 neighbourhoods (census clusters) in total.

To give some clarification on the two variables of interest, note that in the DHS, the length of gestation at the first prenatal visit is obtained in months from the question "How many months were you pregnant at your first prenatal visit ?" So it is thanks to the latter that the answers will be grouped into a dichotomous variable taking the value 1 if the response is less than 4 and 0 otherwise, for the analysis of the timeliness of the first antenatal visit. A second question (how many times have you been in consultation during this pregnancy?) is used to analyse the second criterion of at least 4 antenatal visits during pregnancy.

"Operationalization" of variables

Individual variables

Births have been coded as "first births" and "others" in order to highlight women's behaviour in terms of prenatal visits during their first pregnancy. Regarding the "desirability" of pregnancy, the question was asked with three possible responses (no, yes for now and yes but for later) to distinguish unwanted pregnancies from wanted then pregnancies and from mistimed pregnancies. Unfortunately, in the case of mistimed pregnancies, the number is so low (only 29 cases) that we decided to merge with unintended pregnancies in order to retain only two values: "wanted then pregnancies" and "mistimed or unwanted pregnancies".

The maternal characteristics were mostly grouped into two categories in order to avoid problems of small numbers. Thus, education level, corresponding here to formal education, is coded into "uneducated woman" and "educated woman". Marital status (at the time of the survey) was divided into "married women" and "unmarried women". For ethnicity, the Mossi ethnic group (majority of the capital) was distinguished from the others. For religion, Christianity has been distinguished from other religions (Islam, animism, no religion) as in sub-Saharan Africa, Christians generally have better health behaviour (Akoto 1990). The standard of living of the household (at the time of the survey) was apprehended by a proxy using Principal Component Analysis (PCA) with some assets (radio, TV, refrigerator, moving means, housing materials, electricity). Three categories have been defined: low, medium and high standard of living. Residence duration at pregnancy time was also classified into three categories: "< 5 years","5-9 years" and " ≥ 10 years".

With regard to the sample description, the proportion of mothers with no education is similar to that of educated mothers, whether to analyze the timeliness of the first prenatal visit or the number of visits during the pregnancy (Table 1). Women live to a large majority in union, are from Mossi ethnic group and practice a religion different from Christianity. Nearly ¾ of women are aged between 20 and 34 years, and just over half (54%) lived in Ouagadougou for over 10 years at the beginning of pregnancy. 43% of mothers have a medium standard of living while high and low standards represent, each, a little over ¼ of the sample. Birth order reveals a higher presence of order 2 and above children (approximately 73%) and when looking at the "desirability" of the pregnancy, it appears that more than 70% of children were born after wanted pregnancies.

Table 1 : Sample description

Variables	Timeliness of firth antenatal visit		Number of antenatal visits	
	Number of cases	Pourcentage	Number of cases	Pourcentage
Birth order				
First birth	171	26.3%	171	26.6%
Others	478	73.7%	472	73.4%
Age of mother at pregancy				
< 20 years	109	16.8%	114	17.7%
20-34 years	473	72.9%	462	71.9%
≥ 35 years	67	10.3%	67	10.4%
Mother's residence duration in Ouagadougou				
< 5 years	181	27.9%	182	28.3%
5-9 years	116	17.9%	113	17.6%
≥ 10 years	352	54.2%	348	54.1%
Mother's education level				
No educated		50.8%	330	51.3%
Educated	319	49.2%	313	48.7%
Marital status				
married	592	91.2%	586	91.1%
unmarried	57	8.8%	57	8.9%
Mother's religion				
Christianity	237	36.5%	235	36.5%
Others	412	63.5%	408	63.5%
Mother's ethnic group				
Mossi	497	76.6%	493	76.7%
Others	152	23.4%	150	23.3%
Household standard of living				
Low	189	29.3%	193	30.3%
Medium	279	43.4%	275	43.1%
High	176	27.3%	170	26.6%
Desirability of pregnancy				
Mistimed or unwanted pregnancy	176	27.2%	181	28.2%
Wanted then pregnancy	472	72.8%	461	71.8%
Total	649		643	

Contextual Variables

Here, we must first be reminded that neighbourhood effects are measured at census clusters level which are arbitrary territorial units (administratively meaningless): they are defined by the National Institute of Statistics and Demography to facilitate the logistics of data collection in censuses. In the 1996 census, for example, a cluster consisted of approximately 1,200 people in urban areas (INSD 2000). In the regular districts in Ouagadougou, a cluster is generally composed of few dwellings. It is a neighbourhood in which people can move easily on foot, where neighbours know each other and where social nesting is often important. In this sense, the census cluster, which is also the smallest territorial entity identifiable in DHS data, is an area relevant to the analysis of neighbourhood social characteristics effects.

Regarding operationalization of the variables, contextual education is measured by the percentage of educated women among those aged 15-49. Neighbourhood ethnic composition

is measured by the percentage of women (15-49 years) members of Mossi ethnic group. The mean of PCA scores was used as an indicator of contextual standard of living in each cluster.

Health service availability is measured by the number of health services (general or maternity) and is assigned to each birth, based on the year of early pregnancy. We have seen that census clusters are so small that there would be little sense to attach to each the number of health services existing within it. This number would be zero for many of them. It seemed logical to consider that people attend health services around the cluster and by default, it has been assigned to each cluster the number of health services in the sector in which the cluster is localized. This solution was adopted because the data at our disposal is not without limitations. A cluster may be closer to the health facility of a sector other than that to which it is officially linked. The measure of health provision by a distance indicator would have been more appropriate. The criticism arising from the use of the number of health facilities without prioritization based on levels of care (nursing staff qualifications, equipment, types of care available, cost of use) would however remain. For example, it would have been more appropriate to measure this variable by the number of health facilities which have capacity to provide antenatal care. Our sources of contextual data here contain a "disability", even if one can theoretically consider a correlation between the number of health facilities and the number of services that can provide antenatal care.

Table 2: Some descriptive statistics

Variables	Extreme values	Mean	Standard deviation
Contextual education			
- % of educated women	22.9 – 91.7	59.1	16.8
Contextual standard of living			
- Average PCA score[1]	-0,74 – 1,15	-0,021	0,41
Neighbourhood ethnic composition			
- % of mossi women	25.9 – 94.1	71.5	16.1
Health facilities			
- number of health services	0 - 15	4.7[(b)]	2.9[(b)]

(a) Calculated in the middle period (1998) with observations used in the analysis of the timeliness of the first antenatal visit.

Note that except for health services (the number varies with time), other contextual variables, which are all continuous, were standardized (z-scores) before being introduced into the models, and this, so that their influences are easily comparable, and also comparable to those of qualitative variables (Bryk and Raudenbush 1992). Indeed, most of these qualitative variables are dichotomous (0 / 1) while some continuous variables, including those initially expressed in percentages have higher values and are more dispersed. The odds ratio estimated with such variables in logistic regression are often close to 1, even when they are highly statistically significant, unlike the estimated coefficients with qualitative variables that deviate significantly from 1 when they are very significant. It will tend to believe that these qualitative variables have an effect of higher intensity on the phenomenon studied, compared with continuous variables. This is an incorrect assessment that explains the usefulness of standardizing continuous variables.

[1] In the poorest clusters (PCA score = -0.74), no household has a car or owns electricity. Only 16% own a TV and 5% have tiled floor. In the richest clusters (PCA score=1.5), all of the households own electricity, 89% have TV, 63% have car and 44% have tiled floor.

Statistical methods

Multilevel logistic regression has been used for the analysis. In its design, this method consists in modelling the logarithm of odds ratio as a linear multi-level model, using individual and neighbourhood factors. Variables used in this model come from three levels: birth (birth order and desirability), mother (mother's characteristics) and cluster (contextual characteristics). We opt for a simple model in which only the intercept is considered random.

Given the binary nature of the events studied (1st prenatal visit before the 4th month of pregnancy and at least 4 antenatal visits during pregnancy), we can consider that the answer for every birth i belonging to the mother j and residing in the cluster k is a dichotomous variable Y_{ijk} following a Bernoulli parameter, the latter denoting the probability of realizing the event. Considering P predictor variables at birth level, M explanatory variables at mother level and T variables at cluster level, our multi-level logistic model taking into account all of the characteristics can be defined as follows (Equation E1):

$$\text{logit}(\pi_{ijk}) = \ln\left(\frac{\pi_{ijk}}{1-\pi_{ijk}}\right) = \beta_0 + u_{0j} + v_{0k} + \sum_{p}^{P} \beta_p X_{pijk} + \sum_{m}^{M} \lambda_m Z_{mjk} + \sum_{t}^{T} \delta_t W_{tk} \qquad \text{(E.1)}$$

$$u_{0j} \sim N(0, \sigma^2_{u_{0j}}) \text{ and } v_{0k} \sim N(0, \sigma^2_{v_{0k}})$$

In these equations, u_{0j} is the random error (of the intercept) at mother level and v_{0k} is the error (of the intercept) at cluster level. These two errors, assumed to follow a normal distribution with zero mean and variance known, are independent by construction.

Regarding interpretation, the exponent of each coefficient shows for qualitative variables, the odds ratio between the corresponding value and the reference value, all things being equal. For continuous characteristics, the exponential coefficient indicates the odds ratio when the variable concerned increases by one unit of value. In the case of standardized continuous variables (most of our contextual variables), the exponential coefficient could be interpreted as the odds ratio when the non-standardized variable increases by one standard deviation. Estimation was conducted in MLwiN software.

3. Main Results

Table 3 contains fixed and random effects for both dependent variables. Regarding the random effects, it is noteworthy that the variance at the mother level is far greater than the variance at the cluster level in models. This means that the behavioural differences in terms of use of prenatal care are explained better by individual factors. Moreover, random effects are significant (at both the individual and contextual levels) in the model (model 4), in particular for the timeliness of the first prenatal visit. This suggests the existence of other variables influencing the phenomenon, which have not been taken into account. We thought on the face of it that a qualitative approach would better identify these missing factors. But it should also be noted that the crudeness of some of our indicators, in particular the availability of health facilities measured by the number of health centres and not by the number of maternal health services, did not permit the identification of certain contextual effects.

Table 3: Multivariate results (Odds ratios)

	1st antenatal visit before the 4th month of pregnancy				4 antenatal visits during pregnancy			
Variables	M1	M2	M3	M4	M1	M2	M3	M4
Fixed effects								
Intercept	**1.33*****	1.03	**0.18*****	**0.17*****	**0.60*****	**0.34*****	**0.13*****	**0.14*****
Birth order								
first birth		1	1	1		1	1	1
others		1.31	1.46	**1.48***		1.24	1.25	1.31
Desirability of pregnancy								
Mistimed or unwanted pregnancy		1	1	1		1	1	1
Wanted then pregnancy		**1.29***	**1.32***	**1.35***		**2.03*****	**2.19*****	**2.10*****
Age of mother at pregnancy								
< 20 years			1	1			1	1
20-34 years			**1.71***	**1.77***			1.36	1.39
≥ 35 years			1.07	1.11			1	1.05
Mother's residence duration								
< 5 years			1	1			1	1
5-9 years			1.08	1.08			1.2	1.26
≥ 10 years			1.22	1.21			1.17	1.22
Mother's education level								
No educated			1	1			1	1
Educated			**2.22*****	**2.27*****			**1.72*****	**1.85*****
Marital status								
married			1	1			1	1
unmarried			**0.63****	**0.60****			0.73	0.75
Mother's religion								
christianity			1	1			1	1
others			1.01	0.98			0.87	0.86
Mother's ethnic group								
mossi			1	1			1	1
others			**1.78****	**1.62***			1.12	1.17
Household standard of living								
Low			1	1			1	1
medium			**2.13*****	**2.16*****			1.37	1.38
High			**5.11*****	**5.70*****			**2.12*****	**2.15*****
Neighbourhood caracteristics								
% of educated women				0.93				0.86
health facilities				1				0.97
contextual standard of living				0.88				1.06
% of mossi women				**0.76****				1.05
Random effect (Log scale)								
σ^2 of intercept (mother level)	**0.444****	**0.457****	**0.521***	**0.545***	**0.608*****	**0.605*****	**0.555*****	**0.571*****
σ^2 of intercept (cluster level)	0.108	0.105	**0.221***	**0.205****	0	0	0	0

* p<0.1 ** p<0,05 *** p<0,01.

Effect confirmed for ethnicity at individual and neighbourhood levels

In accordance with our expectations, Mossi women are less timely in their use of health

services for the first prenatal visit. In effect, compared to women from other ethnic groups, the odds of using antenatal care before the 4th month of pregnancy is smaller for Mossi women (table 3). This result is in the same direction as that of Baya (1993) in Bobo-Dioulasso, as it refers to the cultural practices that sometimes surround the management of pregnancy in African societies. As previously reported, the first months of pregnancy must be characterized by a large discretion on the part of the expectant mother in the traditional Mossi society. We have already said, in Burkina Faso, such a conception of pregnancy is not specific to the Mossi ethnic group. But it is possible that it has more weight in this group, as reflected most dramatically in the behaviour of women, even in the capital. Thus, this result seems to indicate that in Ouagadougou, the practice of care related to pregnancy and delivery often combine tradition and modernity. This had been observed by Ouédraogo (1994) from a survey with women who had recently given birth. For example, she had noticed that regarding the traditional protections of the newborn, young mothers, whether educated or not, comply with the requirements provided by the old women. "*The protection against the disease transmitted by the liuula*[2] *is for example also shared by educated women and uneducated women*" (Ouedraogo 1994, p.19). Mothers who use less tradition would do more by ignorance than by will (Ouédraogo 1994). The change in behaviour intervenes only if "*it does not conflict with traditional practices and with the advice of the old woman, when knowledge does not contradict the belief*" (Ouedraogo 1994, p.32).

This relationship with ethnicity also reflects a neighbourhood effect due to the fact that there are more Mossi women in the cluster, unless the first prenatal visit takes place before the 4th month of pregnancy, all things being equal. The odds ratio of the proportion of Mossi women (standardized variable) is estimated at 0.76 (Table 3), which means that any increase in this indicator of a standard deviation (16.1%) would reduce by 24% chances of using a prenatal visit before the 4th month of pregnancy. Conversely, one could also say that every 16% decrease in the proportion of Mossi women, from one neighbourhood to another, would increase by 24% chances to use antenatal services before the 4th month of pregnancy.

As already noted, this kind of contextual effect is due to the transfer of ideas, values and beliefs that generally accompany the interpersonal acquaintances in the neighbourhoods. Some beliefs and practices relating to pregnancy in the Mossi society can be used by mothers from other ethnic groups and living in neighbourhoods with high percentage of Mossi people. This suggests a high degree of social interaction between Mossi women and non-Mossi women in neighbourhoods within Ouagadougou. In this regard, Biehler (2006) had rightly observed that the neighbourhood sociability were independent of ethnicity in Ouagadougou. Moreover, this result seems to support the thesis of Ouédraogo (1994) who, from her sociological observations in Ouagadougou, wrote that popular knowledge has an important place in the lives of people in this city because they are in line with local culture and correspond to the logic of the locality, and also because they are conveyed in the case of care provided to children, by old women who have experience. In this society, old men's (or women's) ideas are unquestionable and unquestioned (Ouédraogo 1994). This is where social control intervenes as a way by which we can explain the contextual effect of ethnicity on prenatal care use. Thus, it is possible that some women, even without being fully convinced, however, adopt the behaviour dominating in their neighbourhood because they fear to be stigmatized.

[2] Imaginary disease which catch children and transmitted by a bad spirit embodied in a bird.

Other influences

As well as the influence of ethnicity, a very positive relationship between educational attainment and antenatal care use can be noted. The odds of using antenatal care before the 4th month of pregnancy among educated mothers are more than twice higher than among uneducated mothers (Table 3). Educated women also have a greater chance of having at least four antenatal visits during pregnancy (Table 3). This influence of education is independent of neighbourhood ethnic composition even if the interaction between the two variables indicates the slight tendency (not significant) of educated women to delay the use of health services for the first prenatal visit in neighbourhoods with high proportion of Mossi women[3] (figure 1).

Figure 1: impact of education on the achievement of a prenatal visit before the 4th month of pregnancy depending on the proportion of mossi women in the cluster

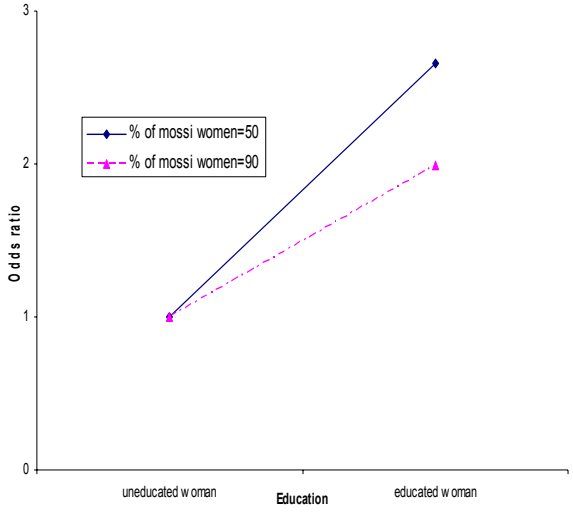
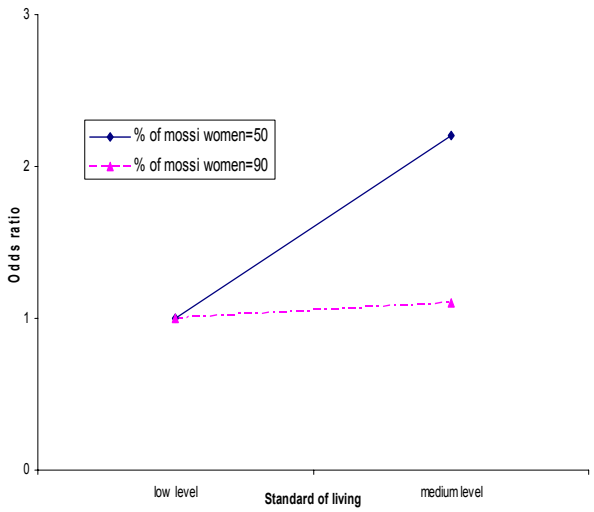


Figure 2: medium standard of living's impact on the achievement of a prenatal visit before the 4th month of pregnancy depending on the proportion of mossi women in the cluster



Another interesting and very significant result observed is with the standard of living. It influences both the timeliness of the first antenatal visit and the achievement of four antenatal visits. The relationship is positive and is also independent of the neighbourhood ethnic composition, although women of medium standard of living have the slight tendency (not significant) to delay use of health facilities for the first antenatal visit in neighbourhoods inhabited by high proportion of Mossi women[4] (figure 2).

Other significant effects on either one of the two phenomena relate to pregnancy status, birth order, woman's age and her marital status (Table 3). It confirms that women are more careful about prenatal visits when the pregnancy is desired. Order 1 children are more likely to benefit the first prenatal visit before the 4th month of pregnancy. This relationship between birth order and early use of prenatal services is negative in Ouagadougou, confirming the hypothesis that women consider that the first pregnancy have higher risks and should therefore require a more rigorous medical surveillance (Bhatia and Cleland 1995; Celik and Hotchkiss 2000). It is also possible that the quality of reception in prenatal services is so bad in Ouagadougou (long waiting time, lack of listening, verbal abuse, etc..) that women, after their first pregnancy, use them less often for early prenatal visit. Poor quality of reception in health services in Burkina Faso had been denounced by Zoubga (2002), but unfortunately his

[3] This interaction has been tested in a separate model not presented here.
[4] This interaction has been tested in a separate model not presented here.

remarks were not based on scientific evidence. The relationship between the woman's age and antenatal care use shows that women of intermediate age (20-34 years) are more likely to use early antenatal visit. They also have a slight advantage (not significant) in the use of at least 4 antenatal visits during pregnancy. Results with marital status show in accordance with our expectations, that the chances of attending a prenatal visit before the 4th month of pregnancy are higher among married women.

Conclusion

The aim of this paper is to highlight, through a multivariate analysis of antenatal visits, the importance of ethnicity. The analysis focused specifically on the timeliness of the first prenatal visit and the number of prenatal visits based on two criteria for medical surveillance of pregnancy: the fact that the first prenatal visit was made before the 4th month of pregnancy and the fact that at least four antenatal have been made during pregnancy.

Controlling for other factors, the effect of ethnicity significantly affects the early use of prenatal care. Mossi women use antenatal care later than women from other ethnic groups. This result was attributed to cultural influences in this ethnic group (Bonnet 1988). The importance of ethnicity has also resulted in the neighbourhood effect. This means that living in a neighbourhood with a high concentration of Mossi women may expose a non-Mossi woman to delayed use of prenatal care. This is an interesting result that highlights the importance of popular knowledge of health behaviour in Africa. These popular conceptions often induce false practices harmful to health. In this sense, some public health policies need to be preceded by a preliminary analysis of the socio-anthropological context.

References

Akoto, E. (1990), « Christianisme et inégalités en matière de mortalité des enfants en Afrique noire », *Population*, vol.45, n°6, pp.971-992.

Baya, B. (1993), *Les déterminants de la mortalité des enfants en milieu urbain au Burkina Faso : cas de Bobo Dioulasso*, Collection des thèses et mémoires n°35, Université de Montréal /Département de démographie, 296 p.

Beninguissé, G. (2003), *Entre tradition et modernité. Les fondements sociaux de la prise en charge de la grossesse et de l'accouchement au Cameroun*, Academia-Bruylant/L'Harmattan, Louvain-la-Neuve, 297 p.

Beninguissé, G., B. Nikiema, P. Fournier et S. Haddad (2004), « L'accessibilité culturelle : une exigence de la qualité des services et soins obstétricaux en Afrique », *African Population Studies*, Supplement B to vol 19, pp.243-266

Bhatia, J.C. et J. Cleland (1995), «Determinants of maternal care in a region of South India», *Health Transition Review*, vol. 5, n°2, pp. 127 - 142.

Biehler, A. (2006), «Renouveau urbain et marginalisation. Le cas d'habitants du centre-ville de Ouagadougou – Burkina Faso», *Revue Tiers Monde*, n°185, pp.57-78.

Bonnet, D. (1988), *Corps biologique et corps social. Procréation et maladies de l'enfant en pays mossi, Burkina Faso*, Editions l'ORSTOM, Paris, 138 p.

BURKINA FASO, INSTITUT NATIONAL DE LA STATISTIQUE ET DE LA DEMOGRAPHIE (2000), *Analyse des résultats du recensement général de la population et de l'habitation de 1996 – Volume I*, INSD, Ouagadougou, 348 p.

Celik, Y. et D. R. Hotchkiss (2000), «The socio-economic determinants of maternal health care utilization in Turkey», *Social Science & Medicine*, vol. 50, pp.1797-1806.

Elo, I. T. (1992), «Utilization of maternal health-care services in Peru: the role of women's education», *Health Transition Review*, vol.2, n°1, pp.49-69.

Essex, C., A. M. Counsell et D. C. Geddis (1992), «The Demographic Characteristics of Early and Late Attenders for Antenatal Care»*, The Australian and New Zealand Journal of Obstetrics and Gynaecology*, vol. 32, n°4, pp.306-308.

Fournier, P. et S. Haddad (1995), « Les facteurs associés à l'utilisation des services de santé dans les pays en développement», in H. Gérard, et V. Piché (dir.), *La Sociologie des populations*, AUPELF/UREF, Montréal, pp.289-325.

Gage, A. J. (1998), «Premarital childbearing, unwanted fertility and maternity care in Kenya and Namibia», *Population Studies*, vol. 52, n°. 1, pp. 21-34.

LeClere, B. F., R.G. Rogers et K. D. Peters (1997), « Ethnicity and mortality in the United States: individual and community correlates», *Social Forces*, vol. 76, n°1, pp. 169-198.

LeGrand, T. K. et C. S. M. Mbacké (1993), «Teenage pregnancy and child Health in the urban sahel », *Studies in Family Planning*, vol. 24, n°3, pp. 137-149.

Levitt, P. (1998), «Social remittances: migration driven local-level forms of cultural diffusion », *The International Migration Review*, vol. 32, n°124, pp. 926-948.

Lianos, M. (2003), « Le Contrôle Social après Foucault », *Surveillance & Society,* vol. 1, n°3, pp. 431-448

Magadi M.A, N. J Madise et R. N. Rodrigues (2000) « Frequency and timing of antenatal care in Kenya: explaining the variations between women of different communities», *Social Science & Medicine*, vol. 51, pp.551- 561.

Mekonnen, Y. et A. Mekonnen (2003), « Factors influencing the use of maternal healthcare services in Ethiopia », *Journal of Health, Population and Nutrition*, vol. 21, n°4, pp.374-382.

Navaneetham, K. et A. Dharmalingam (2002), « Utilization of maternal health care services in Southern India », *Social Science & Medicine*, vol. 55, pp.1849-1869.

Nkrunziza, M. (2007), *Comportements des femmes en matière de recours aux soins obstétricaux aux Burundi*, Mémoire de DEA, Université Catholique de Louvain, Louvain-la-Neuve, 86 p.

Ouédraogo, C. (1994), « Education de la mère et soins aux enfants à Ouagadougou », *Les dossiers du CEPED*, n°27, 37 p.

Pebley, A.R., N. Goldman et G. Rodriguez (1996) «Prenatal and delivery care and childhood immunization in Guatemala: do family and community matter ?», *Demography*, vol. 33, n°. 2, pp. 231-247.

Retherford, R. D. et J. A. Palmore (1983), «Diffusion processes affecting fertility regulation», in R. A. Bulatao et R. D. Lee (éds.), *Determinants of Fertility in Developing Countries*, Academic Press, New York, pp. 295-339.

Zoubga, A. D. (2002), *Services sanitaires et qualité au Burkina Faso : une interprétation et une gestion de la question sanitaire particulièrement avancées malgré les difficultés et les carences*
URL : http://www.africansocieties.org/n3/fr_dic2002/zoubga.htm (site visité le 17 décembre 2008)