

LONGITUDINAL ANALYSIS OF SOCIO-DEMOGRAPHIC INEQUALITIES IN THE USE OF MODERN CONTRACEPTION AMONG WOMEN IN UNION IN COTE D'IVOIRE

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Introduction

Modern contraceptive use in Côte d'Ivoire has risen steadily since the country's first population policies were introduced. Despite this continuous increase over time, modern contraceptive prevalence remains at a low level, given the objectives of these policies. The persistence of low contraceptive prevalence is likely to undermine the country's efforts in reproductive health (especially maternal and child health) and in the search for a demographic dividend, which must necessarily include a reduction in fertility. Over the last few decades, several initiatives have been taken to boost development in the countries of the South, mainly by seeking to reduce fertility. However, despite these efforts, modern contraceptive use among women in union in Côte d'Ivoire has changed little, rising from 6% in 1994 to just 15.5% in 2016 (INS and Macro International, 1995; INS, 2017). Furthermore, although the total fertility rate fell from 5.7 children per woman in 1994 to 4.6 in 2016 (INS and Macro International, 1995; INS, 2017), it remains one of the highest in the world. This high level of fertility, combined with the persistent weakness of modern contraceptive practice, tends to delay the fertility transition in the country. This fertility transition, which is presented as the shift from "natural" fertility to "controlled or directed" fertility, is still far from being a reality in Côte d'Ivoire. This is because, according to the three Demographic and Health Surveys (DHS) carried out in the country, the desired total fertility rate has always been lower than the actual fertility rate observed.

Despite this steady increase over time in modern contraceptive use, its prevalence seems to conceal huge social disparities in the use of modern family planning services over time. According to the three DHSs conducted in the country, urban women use modern contraception more than their rural counterparts (8% compared with 2.2% in 1994; 12.4% compared with 4.6% in 1998 and 16.3% compared with 9.8% in 2012).

The surveys also show a positive relationship between the use of modern contraception and women's level of education. Women with secondary education and above use more modern methods of contraception (13.2% in 1994, 19.6% in 1998 and 19.9% in 2012) than those with lower levels of education. They are followed by those with primary education, with 7.6%, 10.4% and 17.3% respectively in 1994, 1998 and 2012, compared with 2.2%, 4.4% and 9.3% for women with no education during the same periods.

In addition, it has been observed over time that the use of modern contraception is more marked among older generations of women. Women aged between 35 and 49 at the time of the survey

had a modern contraceptive prevalence rate of 11.3% in 1994, 21.2% in 1998 and 33.9% in 2012. Those aged 25-34 were in second place, with 10.5%, 16.8% and 28% respectively having used modern contraception in 1994, 1998 and 2012. Younger women, aged 15-24, come last, with lower modern contraceptive prevalence over time (6.2% in 1994, 11.3% in 1998 and 18.4% in 2012).

All these disparities in the use of modern contraception, based on socio-demographic criteria, highlight major inequalities in this area. The aim of this study is therefore to analyze inequalities in the use of modern contraception in relation to the socio-demographic characteristics of women in union, from an evolutionary perspective. More specifically, it aims to :

- To research the socio-demographic circumstances likely to discriminate against women in union in explaining their use of modern contraception over time, and to rank them.
- To measure, over time, the level of inequality of opportunity among women in union in Côte d'Ivoire in the use of modern contraceptive methods, taking account of the sociodemographic circumstances that play a decisive role in explaining this use.
- For each year, rank these socio-demographic circumstances according to their relative contribution to inequality in the use of modern contraception by women in union.

Data and methods

Because of its longitudinal nature, this study is based on data from the DHS carried out in the country in 1994 and 1998-1999 respectively, and on data from the 2011-2012 DHS-MICS.

The choice of data from these three surveys was justified by their availability and accessibility, but also by their suitability for the needs of our study. They contain the variables needed to achieve our objectives.

The first stage in the analysis of the study data was based on the binary logistic regression method. It is based on an explanation of the dependent variable "use of a modern method of contraception", which is apprehended in a dichotomous manner (0 "non-users of any modern method of contraception" and 1 "users of a modern method of contraception"). The explanatory variables used in this study are place of residence, religion, ethnicity, household standard of living, age group to which the woman belongs, level of education and economic activity. These variables were chosen based on their ability to reflect certain social realities of women in union in Côte d'Ivoire about FP. They are therefore in line with the study's analysis.

The hierarchy of circumstances explaining the use of modern contraception by women in union in Côte d'Ivoire for each year was established by calculating the relative contribution of the different explanatory variables.

To quantify the unequal opportunities for women in union to use modern contraception according to certain characteristics, the study calculated the dissimilarity index or D-index. This index summarizes the differences between the use of modern contraception by well-defined groups of women according to certain socio-demographic circumstances and the total use of modern contraception by the population. The variable of interest on which the calculation of this index is based is the use of a modern contraceptive method. The socio-demographic characteristics selected in this study are those that will prove significant in explaining the use of modern contraception in the first stage of analysis. Most of these variables do not a priori reflect the notion of circumstance underlying the inequalities of opportunity measured by the D-index (Romer, 1998). However, the domain to which the calculation of this index is applied differs greatly from its traditional domains, since contraceptive use is far from being a basic service like education and health. Thus, taking this particularity into account may justify the choice of these variables, which are considered in the literature to be major factors of discrimination in the use of modern contraception.

Subsequently, we proceeded to decompose the dissimilarity index considering one of the objectives of the study. This decomposition is based on Shorrocks' (2013) proposal based on Shapley's (1953) conception. It makes it possible to estimate the relative share of each socio-demographic circumstance in the D-index to highlight those that contribute most to inequality in the use of modern contraception.

Preliminary results

Research into socio-demographic circumstances likely to discriminate against women in union in explaining their use of modern contraception.

The results of the binomial logistic regression (Table 1) highlighted the socio-demographic circumstances that explain the use of modern contraception by women in union in Côte d'Ivoire for each of the study years. Of these, the household standard of living, the woman's level of education and her economic activity were common to all three years.

It was found that the chance of using modern methods of contraception increased with the standard of living of the household in which the woman lived, in each of the years studied. In 1994, women living in households with a high standard of living were 2.7 times more likely to use modern contraception than those living in households with a medium or low standard of living. Between 1994 and 1998, this chance increased in favor of women from high-income households, reaching a level of 4.3, before falling back in 2012 (with an odds ratio of 2).

In addition, the likelihood of using a modern method of contraception increases significantly with a woman's level of education over time.

However, between 1994 and 1998, these odds fell for women in primary and secondary education and above, compared with women with no education (their odds ratios fell from 2.4 to 1.6 for women in primary education and from 2.8 to 2 for women in secondary education and above). However, between 1998 and 2012, the odds of using modern contraception for women in secondary education and above compared with those with no education continued to fall (reaching an odds ratio of 1.7), while those for women in primary education rose slightly (reaching an odds ratio of 1.7).

The continuing influence over time of a woman's economic activity on her use of modern contraception can be observed in different ways. In 1994, only businesswomen were significantly 1.7 times more likely to use modern contraception than inactive women. While in 1998 these women did not differ significantly from inactive women, in 2012 they had a lower chance of using modern contraception than in 1994 (with an odds ratio of 1.5). However, in 1998, it was women farmers who were significantly 0.4 times less likely to use a modern method of contraception than inactive women. In 2012, in addition to shopkeepers, women in the services sector were also 1.4 times more likely to use modern contraception than inactive women.

In addition to these factors, which are common to all three years of the study, other factors such as place of residence (in 1994), ethnicity (in 1994), age group (in 1994 and 2012) and religion (in 1998 and 2012) also explain the use of modern contraception in specific ways. In 1994, urban women were 1.5 times more likely to use a modern method of contraception than rural women. In the same year, women from the Krou and Akan ethnic groups were the only ones to make significantly more use of modern contraception than foreign women. Krou and Akan women were 2.3 times more likely to be aware of the event, while foreign women were 1.8 times more likely to be aware of it. The significance of the influence of the woman's age group on the use of modern contraception can be seen in the fact that in 1994 and 1998, only women in the 25-34 age group were significantly more likely to have experienced this event. This chance fell from a higher value of 1.5 in 1994 to a lower value of 1.3 in 2012. In the case of religion, it was only in 1998 and 2012 that it was found to be significantly associated with modern contraceptive practice. In 1998 and 2012, Christian women were 1.9 and 1.4 times more likely to use modern contraception than Muslim women and women of other religions. However, the chances of Christian women using modern contraception fell by around 0.5 points between these two dates.

Table 1: Binomial logistic regression results by year

Variables	1994	1998	2012
Place of residence			
Urban	1.513**	0.912 ^{ns}	1.013 ^{ns}
Rural	Ref	Ref	Ref
Ethnic group			
Akan	1.804**	2.012 ^{ns}	1.038 ^{ns}
Krou	2.324***	0.980 ^{ns}	0.901 ^{ns}
Mande	1.094 ^{ns}	1.131 ^{ns}	1.087 ^{ns}
Gur	0.794 ^{ns}	0.598 ^{ns}	1.223 ^{ns}
Foreign	Ref	Ref	Ref
Religion			
Muslim	Ref	Ref	Ref
Christian	1.039 ^{ns}	1.878**	1.353***
Other	1.065 ^{ns}	1.428 ^{ns}	0.946 ^{ns}
Household standard of living			
Low	Ref	Ref	Ref
Medium	1.242 ^{ns}	1.319 ^{ns}	1.369**
High	2.771***	4.280***	2.000***
Level of education			
No	Ref	Ref	Ref
Primary	2.430***	1.619**	1.691***
Secondary and above	2.830***	1.985**	1.718***
Economic occupation			
Inactive	Ref	Ref	Ref
Executives	1.703 ^{ns}	0.644 ^{ns}	0.913 ^{ns}
Retailers	1.726***	1.104 ^{ns}	1.459***
Women farmers	0.641 ^{ns}	0.351***	0.859 ^{ns}
Services	1.242 ^{ns}	0.750 ^{ns}	1.371**
Groupe d'âge			
15-24 years	Ref	Ref	Ref
25-34 years	1.468**	1.267 ^{ns}	1.293**
35-49 years	1.270 ^{ns}	1.172 ^{ns}	1.094 ^{ns}
Chi2	274.513	140.663	232.355

ns (not significant): $p < 1$, *: $p < 0.10$, **: $p < 0.05$, ***: $p < 0.01$; Ref: Reference mode

Sources: EDSCI 1994 and 1998 and EDSCI-MICS 2012 data by the author.

Hierarchization of socio-demographic circumstances explaining the use of modern contraception by women in union in Côte d'Ivoire.

Ranking the circumstances that encourage women in union in Côte d'Ivoire to use modern contraception shows that the three factors common to all three years explain this phenomenon the most. According to table 2, in 1994, 1998 and 2012, the household standard of living, the woman's level of education and her economic activity are the three factors that contribute most to women's use of modern contraception. However, the predominance of education in 1994 and 2012, with contributions of 31% and 34% respectively. This variable came third in 1998,

contributing 12% of the explanation for the use of modern contraception. Household standard of living came in at 2ème in 1994 (26%), 1ère in 1998 (50%) and 3ème in 2012 (22%).

Economic activity was ranked 3ème in 1994 and 2ème in 1998 and 2012 respectively.

Table 2: Year-by-year ranking of socio-demographic circumstances according to their contribution to explaining women's use of modern contraception.

Variables	Contributions (%)		
	1994	1998	2012
Place of residence	4.78	NS	NS
Religion	NS	9.43	10.43
Ethnic group	14.55	NS	NS
Household standard of living	25.49	50.07	22.20
Level of education	31.34	11.49	33.70
Economic activity	19.37	29.00	26.84
Age group	4.47	NS	6.83

NS : Not significant

Sources: EDSCI 1994 and 1998 and EDSCI-MICS 2012 data by the author.

Measuring inequality of opportunity in the use of modern contraception among women in union in Côte d'Ivoire.

The inequality of opportunity in the use of modern contraception among women in union in Côte d'Ivoire, according to the sociodemographic circumstances that play a decisive role in explaining this phenomenon, has fallen steadily over time. The dissimilarity index used to measure this inequality fell from 0.41 in 1994 to 0.27 in 1998, then to 0.16 in 2012 (Table 3). This reflects the extent of the socio-demographic disparities that existed in the use of modern FP services among these women. These disparities would have narrowed over time, given the fall in the dissimilarity index.

However, Shapley's breakdown of this index shows that two socio-demographic circumstances seem to be the main cause of the inequalities observed over time in the use of modern contraception. The first of these is the woman's level of education, which is responsible for 33.57% of these inequalities in 1994, 52.36% in 1998 and 64.24% in 2012. This is followed in the same years by the household standard of living, which contributed 23.90% in 1994, 31.43% in 1998 and 30.87% in 2012.

Furthermore, the only time it was considered in the calculation of the dissimilarity index, because of its significance in 1994, place of residence turned out to be the 3rd socio-

demographic circumstance to have a significant share (23.50%) in the creation of the inequality observed during that year. This 3rd place was occupied by the woman's economic activity in 1998 (14.79%) and by the age group to which the woman belonged in 2012 (4.31%).

Table 3: Results of the dissimilarity index measurement and its breakdown according to Shapley per year.

Variable	1994		1998		2012	
	Values	Relative contributions (%)	Values	Relative contributions (%)	Values	Relative contributions (%)
Place of residence	0.096	23.500	-	-	-	-
Religion	-	-	0.004	1.410	-0.0004	-0.230
Ethnic group	0.058	14.130	-	-	-	-
Household standard of living	0.098	23.900	0.086	31.430	0.050	30.870
Level of education	0.137	33.570	0.142	52.360	0.103	64.240
Economic activity	0.017	4.210	0.040	14.790	0.001	0.380
Age group	0.003	0.700	-	-	0.007	4.310
Index of dissimilarity	0.409	100.000	0.272	100.000	0.160	100.000

Sources: EDSCI 1994 and 1998 and EDSCI-MICS 2012 data by the author.

Conclusion and recommendations

The importance of the consequences of not using a modern method of contraception on maternal and child health, and on a country's development objectives, is becoming increasingly apparent in Côte d'Ivoire. According to the demographic surveys carried out in the country, this lack of use of modern contraception is unevenly observed among women in union. This study highlighted inequalities in the use of modern contraception, in relation to the socio-demographic characteristics of women in union, from a longitudinal perspective.

It was found that the use of modern contraception by women in union in Côte d'Ivoire in 1994, 1998 and 2012 was mainly explained by their level of education, the standard of living of the household to which they belonged and their economic occupation. In addition, it was observed that the level of inequality in the use of modern contraception, which was high in 1994, fell sharply over time. These inequalities were most influenced by socio-demographic circumstances related to the woman's level of education and the household's standard of living. However, the observed reduction in these inequalities over time is the result of the positive impact of FP programs on all women, regardless of their socio-economic status.

It is therefore important that future actions in favor of FP focus on the most disadvantaged social categories in relation to socio-economic circumstances such as level of education and household standard of living. More specifically, women with no education and those living in households with a low standard of living should be the priority targets of FP programs.

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