Fertility differentials between formal and informal neighborhoods in Ouagadougou

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Abstract (133 words)

Although fertility remains high in rural Burkina Faso, the fertility transition is well advanced in urban areas (TFR = 3.4 in Ouagadougou 2010 DHS). Little is known, however, about fertility differentials within cities. African cities are made of formal and informal neighborhoods, the latter being inhabited more often by poor families and women having migrated from rural areas. Using data collected in the Ouagadougou Demographic Surveillance System since 2008, we find large differences between fertility rates in informal (TFR = 3.5 children) and formal (TFR = 1.8 children) neighborhoods. To explain these differences, we investigate several hypotheses: a migration from rural to urban areas effect (higher fertility intentions for women born in rural areas), a higher difficulty in accessing contraception in informal settlements, and a selection of young settling families in informal neighborhoods.

Introduction

Although fertility remains high in rural Burkina Faso (6.9 children per women in rural areas according to the last Demographic and Health Survey in 2003, 6.8 according to the last census in 2006), the fertility transition is well advanced in urban areas: women have 3.1 children on average in the capital city Ouagadougou according to the 2003 DHS (4.1 according to the census 2006, 3,4 according to the preliminary results of the 2010 DHS). The fertility is driven down by a later age at marriage for women in the city, and higher contraceptive use within marriage and lower rates of marital fertility.

Little is known about fertility differentials within cities (Weeks et al. 2010), except that more educated and richer women want and have less children. Cities are made of formal and informal neighborhoods, the latter being inhabited more often by poor families, uneducated individuals, and women having migrated from rural areas (60% individuals aged 15 and more born in rural Burkina in the Ouaga DSS informal areas, and 40% in its formal areas). The literature on migration and fertility in Sub Saharan Africa shows that women migrating from rural areas to cities have less children than women who stay in rural areas, although they still have higher fertility rates than native city dwellers, partly because they have higher fertility intentions (Brockerhoff 1995; Shapiro and Tambashe 2002; White et al. 2005; Muhidin and Ledent. 2005; Shapiro and Gebreselassie 2007).

Poor, uneducated women and women having migrated from rural areas may also experience difficulties in accessing reproductive health services, for financial reasons, and because of a distance with health services (familiarity with services and difficulties in being mobile within the city). These difficulties would translate in higher rates of unplanned births and higher fertility in informal neighborhoods.

Finally, Ouagadougou is a rapidly expanding city, and new neighborhoods are constantly growing at its fringes. Peripheral informal neighborhoods in Ouagadougou are areas of future urban development, and its inhabitants hope to obtain a legal plot of land in the future. Results of the Ouaga Demographic Surveillance System show that these inhabitants are predominantly made of young families or single men trying to establish themselves. The recent move of young families in certain areas of the city could foster large period differentials in fertility trends between formal and informal neighborhoods in Ouagadougou.

In this paper, we will compare the fertility trends in formal and informal neighborhoods in the Ouaga DSS. We will then investigate the different hypotheses outlined above (a higher fertility intentions for migrant, uneducated and poor women effect, a unmet need for contraception effect, and a selection of young families into certain neighborhoods effects) to explain the differences in fertility patterns found between the formal and the informal neighborhoods of Ouagadougou, using data collected in the frame of the Ouaga DSS.

Data

In this analysis, we will contrast the informal and formal neighborhoods followed since the end of 2008 in the Ouagadougou Demographic Surveillance System (www.issp.bf\OPO). About 40 000 residents lived in each type of neighborhoods at the beginning of the observation. After an initial census (R0), we collected data on all vital events during two rounds (R1 and R2); we collected a total of 2940 birth during these two rounds. We know the wantedness statut of each of these births, and the age and marital status of the mother at birth. At R1, we collected data on the migratory, birth and marital history of all adult residents, data on the educational attainment and economic activity of every resident, and data on the wealth (index of goods) of every household. At R2, in the frame of a health survey, we collected data on sexual activity, contraceptive use, and fertility preferences of 760 women aged 15 to 49 representative of the areas covered by the Ouaga DSS.

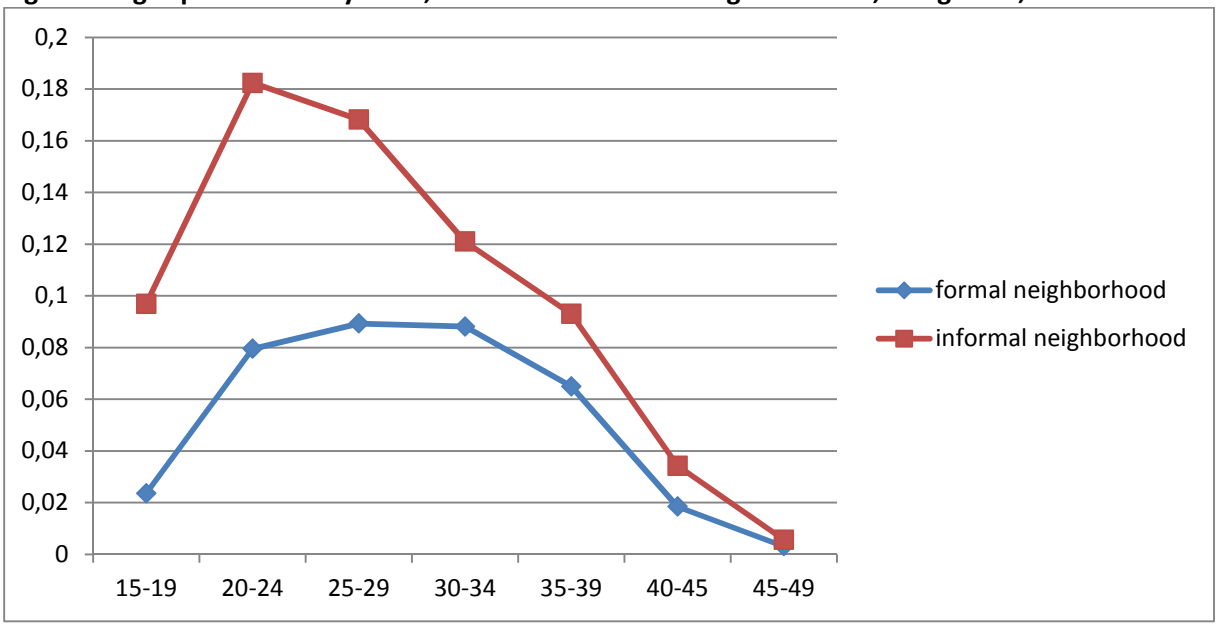
Results

The total TFR in our areas is 2,5 children per women. This number was 3,4 for Ouagadougou as a whole in 2010 (DHS), and the TFR in the Ouaga DSS areas is likely to be higher than the average for the entire city, because these neighborhoods are poorer and inhabited by more women from rural areas. Births were underreported during R1 and R2, because of a defect in the questioning routine: the question on births since the last visit was not asked for every woman in reproductive age in the household, but only to women who had reported a pregnancy during the last visit (this problem was fixed for R3, whose data are not available yet). However, differentials in fertility rates are informational, despite this underreporting, because the biases affect all households likewise (except the problems of absent households at R1, somewhat larger in informal neighborhoods).

The total fertility rate varies by type of neighborhood in the Ouagadougou DSS: it was 1.8 children per woman on average in formal areas and 3.5 in informal ones during the 2009-2010 period. The period fertility rate is therefore almost twice as large in the informal areas compared to formal ones.

The difference in the level of fertility between types of neighborhood is driven by very different age patterns (R1 and R2 births). In formal neighborhoods, women have much lower fertility rates at younger ages (15 to 29); fertility rates at older reproductive ages (30 to 44) are close on the other hand (Figure 1).

Figure 1. Age specific fertility rates, informal and formal neighborhoods, Ouaga DSS, 2009 and 2010



Hypothesis 1: Migrant/ poorer / uneducated women have higher fertility intentions

The majority of residents of OPO of 15 and over were born in rural Burkina Faso (52% of residents aged 15 and over) (Table 1). This proportion reaches 64% in informal areas, against 41% in formal areas. A significant proportion of residents aged 15 and over (11%) were born in the Republic of Côte d'Ivoire (13% and 9% in informal areas) 7% of residents aged 15 and over from other cities in Burkina Faso (8% in formal and 6% in informal areas).

Table 1. Place of birth of the 15 years old and over * (R1 residents) per areas

	Ouaga	other Burkina cities	Rural Burkina	Côte d'Ivoire	other African countries	Other countries	NSP	Total informed
formal areas	8181	1813	9467	3008	230	15	167	22881
	35,8%	7,9%	41,4%	13,1%	1,0%	0,1%	0,7%	
informal	3689	1130	12008	1689	121	14	50	18701
	19,7%	6,0%	64,2%	9,0%	0,6%	0,1%	0,3%	
Total	11870	2943	21475	4697	351	29	217	41582
	28,5%	7,1%	51,6%	11,3%	0,8%	0,1%	0,5%	

* The migration histories were collected for all residents from age 15.

In total 46% of residents aged 15 and over did not attend school, and this proportion is significantly lower in the formal settlements (36%) than in informal settlements (59%). Women 15 and older are very often without school education (53%) compare to men of the same age (40%).

Table 2. Level of education of 15 years and over * (R1 residents) per neighborhood and sex

	None	Primary education	Secondary education	Higher education	Total informed	Non informed	Total
Formal area	8331	5570	7794	1321	23016	3955	26971
	36,2%	24,2%	33,9%	5,7%		14,7%	
Informal area	11029	4480	3048	148	18705	2680	21385
	59,0%	24,0%	16,3%	0,8%		12,5%	
Total	19360	10050	10842	1469	41721	6635	48356
	46,4%	24,1%	26,0%	3,5%		13,7%	
Men							
Formal area	3351	2981	4251	892	11475	2087	13562
	29,2%	26,0%	37,0%	7,8%		15,4%	
Informal area	5181	2594	1789	116	9680	1615	11295
	53,5%	26,8%	18,5%	1,2%		14,3%	
Total	8532	5575	6040	1008	21155	3702	24857
	40,3%	26,4%	28,6%	4,8%		14,9%	
Women							
Formal area	4980	2589	3543	429	11541	1868	13409
	43,2%	22,4%	30,7%	3,7%		13,9%	
Informal area	5848	1886	1259	32	9025	1065	10090
	64,8%	20,9%	14,0%	0,4%		10,6%	
Total	10828	4475	4802	461	20566	2933	23499
	52,7%	21,8%	23,3%	2,2%		12,5%	

Table 3: Percentage of poor households and average living standards depending on the area

Area	**% of poor households**	**Average standard of living**
Rural Burkina	73,1% [73.06 -73.18]	-0.248 [-0.249 -0.247]
Ouagadougou	24,2% [24.03 - 24.37]	1.137 [1.132 - 1.142]
Observatory of Ouagadougou	50,1%	0,292
✓ Formal areas	27,2%	0,918
✓ Informal areas	65,6%	-0,129

Note : between brackets, the confidence interval at 95%

The living standards index indicates that about 35% of household heads are educated in the least favoured class, 55% in the middle class and 82% in the most favoured class. Related to the type of settlement, two thirds (66%) of households residing in informal settlements have low living standards against 27% in formal settlements.

Using data from the 2010 health survey, we computed a "desired number of children" for women aged 15 to 49 who responded to survey. This number is not the "ideal number of children" (women are asked how many children they think is ideal for a family like theirs in their country today, irrespective of how many children she already has). The "desired number of children" is the number of children a woman already has, to which the number of children she still wants in the future is added; this way to calculate the desired number of children assumes that all past children are desired. This may be inaccurate in a population of women who have finished childbearing. However, in the Ouaga DSS areas; 76% of women still want children (health survey data), and 98.5% of births (R1 and R2) are desired. In a population of young women such as the one of the Ouaga DSS the "desired number of children" calculated as described largely reflects a target family size.

Although period fertility rates are widely different between formal and informal neighborhoods (twice as large in informal areas), fertility desires are relatively close according to data from our health survey (Figure 2). Women want 4.1 children on average in formal areas and 4.6 in informal ones. In Ouagadougou as a whole (2003 DHS) women's ideal number if children was 4.0 (results on the ideal number of children is not yet available from the 2010 DHS, but the level of fertility did not decrease between the two surveys, the TFR was 3.1 in 2003 and 3.4 in 2010).

Differences in fertility preferences by place of birth (born in Ouaga or born elsewhere, most migrants being born in rural Burkina Faso) are rather small, although they go in the expected direction: women born in Ouaga want 4.0 children on average and women born out of Ouaga want 4.5 (Figure 3).

Differences in the desired number of children by educational level, by contrast, are large (3.2 for women with tertiary education and 4.9 for women with no education) (Figure 4). Difference according to the level of poverty (which reflect in part differences in educational level) are also large. Women living in the poorest households want 4.9 children on average, women in the medium wealth category want 4.4 children on average and women in the richest wealth category want 3.7 children on average (Figure 5).

Figure 2

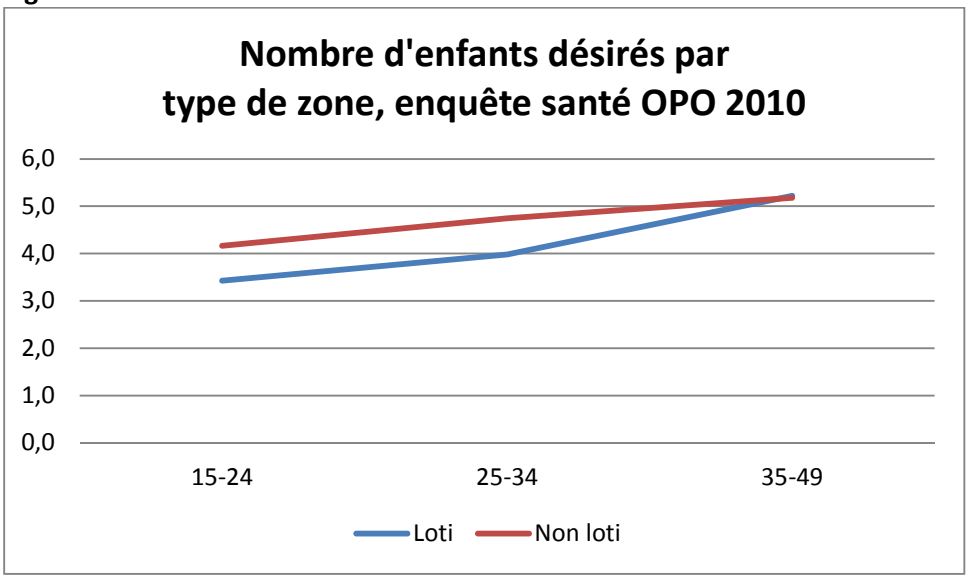


Figure 3

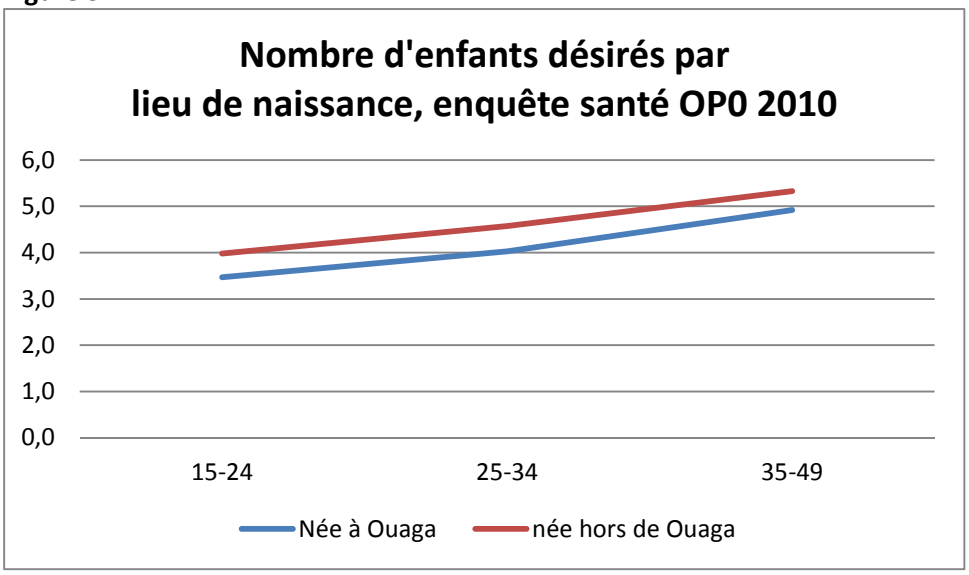


Figure 4

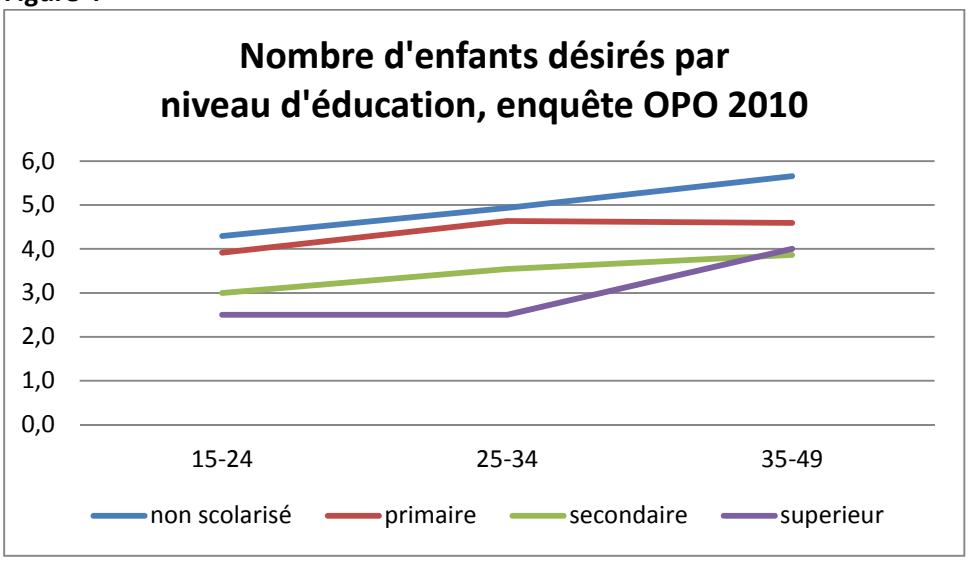
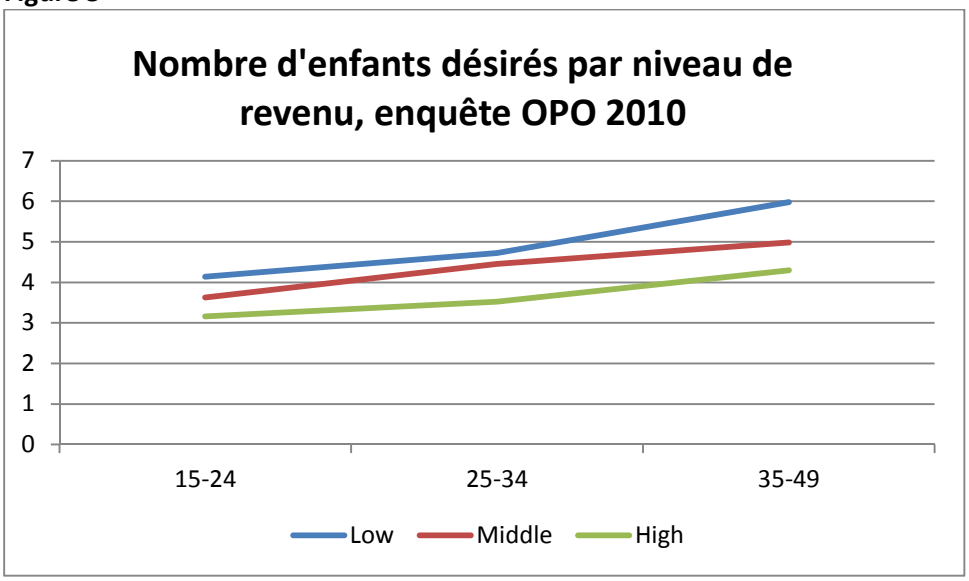


Figure 5



A logistic regression on the number of desired children shows an important age effect, also visible in Figures 2 to : younger women want less children, everything else being constant. Being born outside of Ouagadougou on the other hand, once education is controlled for, is not significantly related to the number of desired children. Similarly, the level of poverty, and living in a formal or informal neighborhood do not have an independent relation with the desired number of children, once education is controlled for. On the other hand, the level of education is strongly linked to the number of desired children. Generation and education are the two vectors of change when it comes to the number of desired children in Ouagadougou today.

Table 4. Logistic regression (1: want more than 4 children; 0; want 4 children or less), health Survey 2010, Ouaga DSS, women aged 15 to 49 (n=760)

		B	S.E.	Wald	df	Sig.	Exp(B)
Age	15-24						1
	25-34	,384	,226	2,891	1	,089	1,468
	35-49	1,175	,280	17,606	1	,000	3,238
Born in Ouaga	Out of Ouaga						1
	Ouagadougou	-,158	,218	,524	1	,469	,854
Marital status	Never Married						1
	Married	,526	,313	2,834	1	,092	1,693
	Divorced widowed	-,836	,595	1,972	1	,160	,433
Zone	lotie						1
	non lotie	,377	,215	3,081	1	,079	1,458
Class	Poor						1
	Medium	-,245	,202	1,476	1	,224	,783
	High	-,551	,416	1,754	1	,185	,576
Educational level	None						1
	Primary	-,058	,226	,066	1	,797	,944
	Secondary	-1,357	,277	23,972	1	,000	,257
	Superior	-2,031	1,068	3,613	1	,057	,131
	Constant	-,806	,335	5,801	1	,016	,447

In summary, part of the fertility differentials between formal and informal neighborhoods is explained by different fertility intentions. However, differences in fertility desires are only of 0.5 children between the two types of areas (4.1 in formal areas and 4.6 in informal areas). Fertility intentions differentials do not explain the large differences in fertility observed (TFR= 1.8 in formal areas and 3.6 in informal areas).

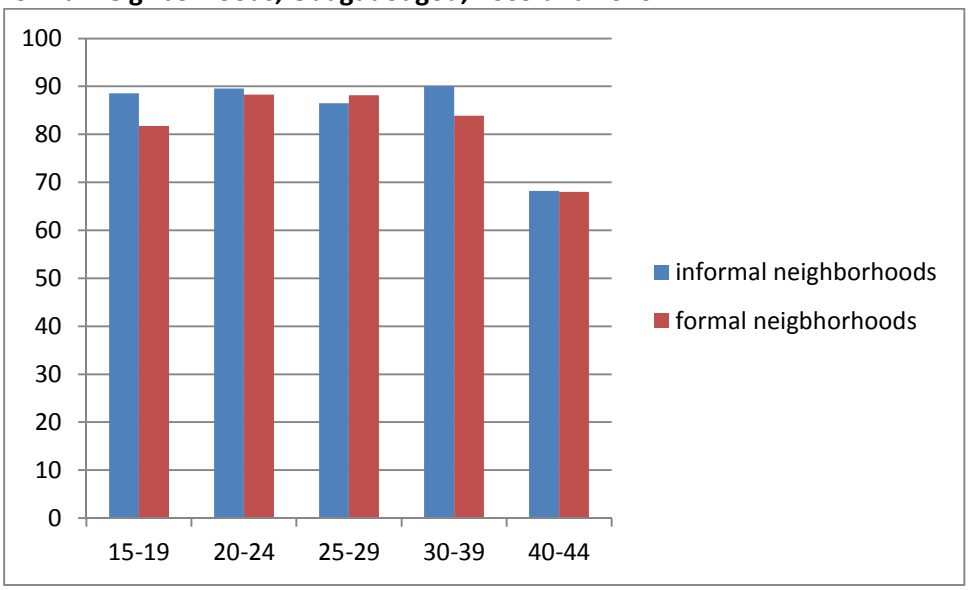
Hypothesis 2: An unmet need for contraception effect

Poor, uneducated women and women having migrated from rural areas may also experience difficulties in accessing reproductive health services. These difficulties would translate in higher rates of unplanned births and higher fertility in informal neighborhoods.

The proportion of desired birth (not controlling for age) is high in the Ouaga DSS: 86.5% of all births were declared as “desired at that time”, and 12% as desired later. Only 1.5% births were declared as “unwanted” (births R1 and R2). This result matches those of the 2003 DHS for Ouagadougou: the TFR was 3,1 and the TFR of births desired at the time of conception was 2,8.

The proportion of "wanted at that time" birth is similar across formal (84%) and informal (88%) neighborhoods, although the proportion of unwanted births is somewhat higher at young (15-19) and older (35-39) reproductive ages in formal neighborhoods, indicating greater unmet needs for delaying and limiting in the latter areas.

Figure 6. Proportion of births which are "wanted at the time" by age of mother, informal and formal neighborhoods, Ouagadougou, 2009 and 2010



An analysis of need for family planning using classical definition (ever had sex, does not want a child in the next two years, not pregnant and fertile) and of the contraceptive practices of women who respondent to the health survey show that unmet need for contraception is not significantly higher in informal compared to formal areas, despite the disadvantages (educated, poverty level and place of birth) of women living in informal areas (Table 5).

Table 5. Unmet need for family planning in formal and informal areas

	Formal areas	Informal areas	Total
Modern method	29,9%	33,5%	31,7%
Traditional method	46,4%	42,2%	44,3%
Unmet need for FP	23,7%	24,3%	24,0%
Total	100%	100%	100%
N	211	218	429

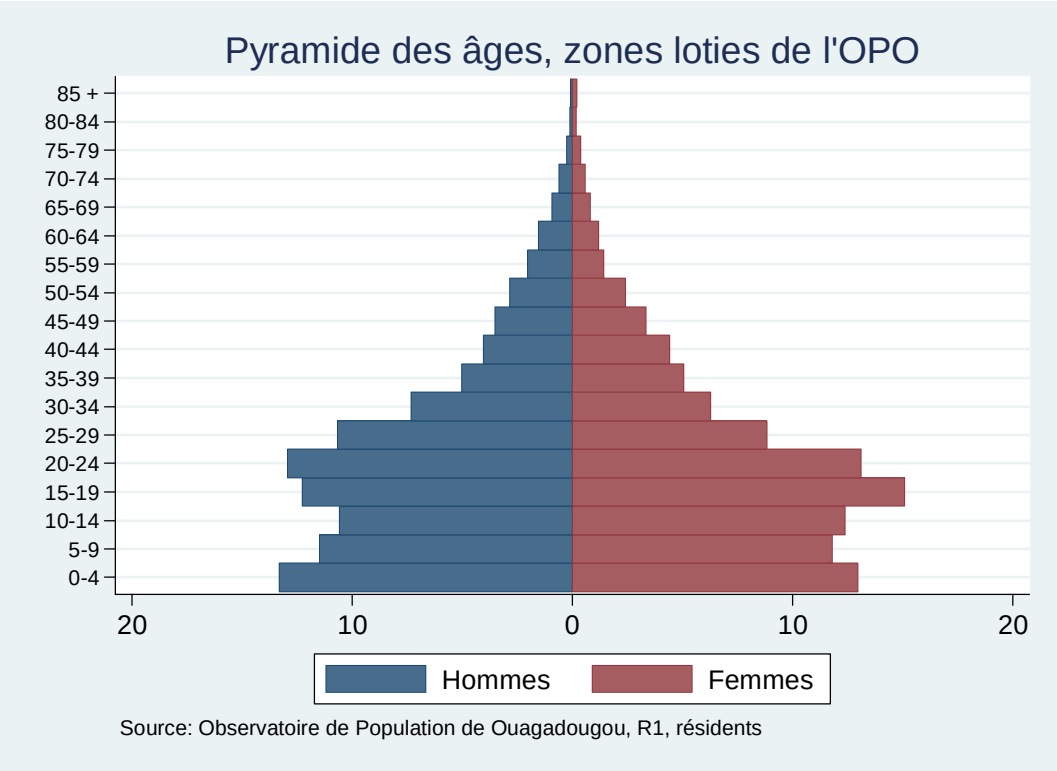
We thus conclude that the higher level of fertility observed in formal areas is not related to a greater difficulty of women living in those areas to practice fertility control.

Hypothesis 3: a selection effect of young families in informal neighborhoods

The analysis of the age structure and the relationship to the head of household of the female population living in neighborhoods (Rossier, Soura et al. 2011) shows the population of children is also highly skewed towards younger children in informal areas: 13.1% of the population is under 5 years in formal districts against 20.1% in informal ones (Figure 7 and Figure 8). Also, most women in reproductive ages living in these areas are married (Figure 9). Obviously, the inhabitants of informal areas are mainly young families. Accordingly, women in reproductive ages still go to school in

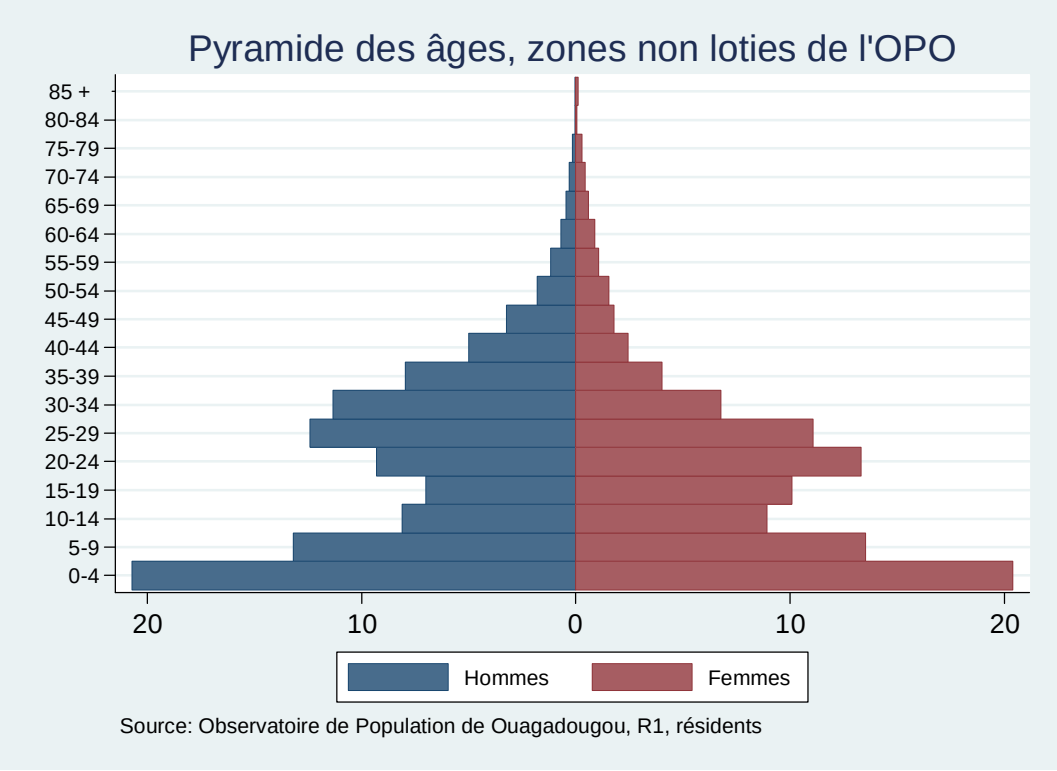
informal areas: while 22% of women aged 15 to 49 currently go to school in formal areas, only 6% are in that case in formal areas (Figure 10).

Figure 7



Source: Observatoire de Population de Ouagadougou, R1, résidents

Figure 8



Source: Observatoire de Population de Ouagadougou, R1, résidents

Figure 9

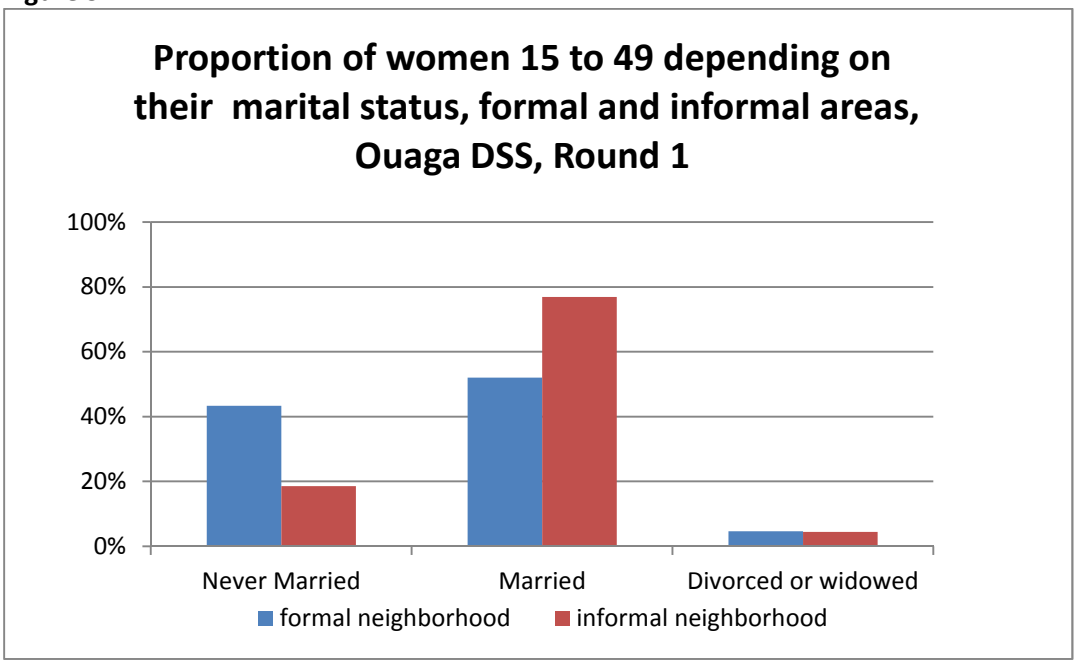
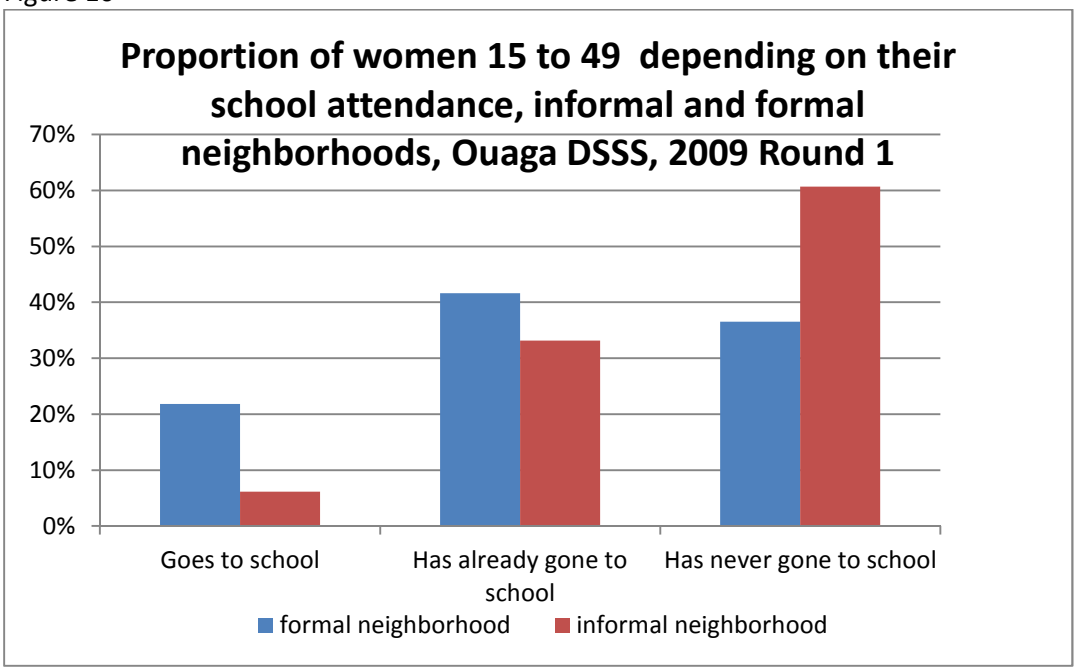


Figure 10



Women living in informal areas are a highly selected group; they move there when they marry to live with their spouse, either coming from formal areas of Ouagadougou or from outside of Ouaga. Preliminary analyses indicated that marriage, first births and the move to informal areas are not tightly linked. For example, out of the new female residents registered between the end of 2008 and 2011, and aged 15 to 49, 23% give marriage as the reason for their arrival in formal areas, against 17% in informal areas.

Conclusion

We will have to wait for data from R3 to compute the fertility rate in the Ouaga DSS area, and to confirm large differences between formal and informal neighborhoods. These large differences seem not to be driven by greater contraceptive failures in informal neighborhoods. Differences also seem to be explained only to a modest extent by differences in fertility preferences between native and migrating women. However we find that many young women living in formal neighborhood (migrants and natives) are currently delaying their entry into adulthood (sill being in school), and young women living in informal neighborhood (migrants and natives) have mainly moved there recently, are married and have small children; this selection effect create large fertility differentials. In 20 years from now, young women living in formal and informal areas may have achieved the same family size.

References

ANTOINE P., NANITELAMIO J. (1991), "More Single Women in African Cities: Pikine, Abidjan and Brazzaville", *Population: An English Selection, 3,* 149-169.

Brockerhoff Martin 1995. “Fertility and family planning in African cities: the impact of female migration”. *Journal of Biosocial Science* 27: 347-358

Kinfu Yohannes. 2000. “Below-replacement fertility in Tropical Africa? Some evidence from Addis Ababa”. J*ournal of Population Research*, Volume 17, Number 1.

KIRK D., PILLET B. (1998), "Fertility Levels, Trends, and Differentials in SubSaharan Africa in the 1980s and 1990s", *Studies in Family Planning,* 29(1), 1-22.

Muhidin Salahudin and Jacques Ledent. 2005. “Migration and Fertility in Burkina Faso: Evidence from the 2000 Survey on Migration/Urbanization and Environment” Paper presented at the XXVth IUSSP International Population Conference, Tours, France 18-23 July 2005.

Shapiro D. and T. Gebreselassie, 2007, “Fertility Transition in Sub-Saharan Africa: Falling and Stalling”, *Paper presented at the 2007 PAA*, New York, April 2007.

Shapiro D. and B. O. Tambashe, 2002, “Fertility Transition in Urban and Rural Sub-Saharan Africa: Preliminary Evidence of a Three-Stage Process.” *Journal of African Policy Studies*, vol. 8, N°2-3, pp.

White, M.J., E. Tagoe, C. Stiff, K. Adazu, and D.J. Smith. 2005. “Urbanization and the Fertility Transition in Ghana,” *Population Research and Policy Review*. 24:59-83.

Weeks, John R. ,Getis, Arthur , Hill, Allan G., Agyei-Mensah, Samuel and Rain, David. (2010) 'Neighborhoods and Fertility in Accra, Ghana: An AMOEBA-Based Approach', Annals of the Association of American Geographers, 100: 3, 558 — 578.