

Multipartner Fertility in Nicaragua: Complex Family Formation in a Low-Income Setting

CONTEXT: Multipartner fertility (having children with more than one partner) is an important topic in demographic research, but little is known about its incidence and correlates in low-income settings, where rates may be high because of poverty, union instability and early childbearing.

METHODS: Data from the 2011–2012 Encuesta Nicaragüense de Demografía y Salud were used to calculate the prevalence of multipartner fertility among 8,320 mothers and 2,141 fathers with two or more children. Logistic and multinomial regression were used to identify individual and family characteristics associated with multipartner fertility.

RESULTS: Among those with multiple children, 33% of mothers and 41% of fathers had had children with more than one partner. The prevalence of multipartner fertility was elevated among less-educated women, nonreligious men, and women and men who had grown up in urban areas (odds ratios, 1.3–1.6). Multipartner fertility was associated with lower current household wealth among mothers, and with increased risk of single parenthood and higher fertility among mothers and fathers. Fathers who had had multiple fertility partners were six times as likely as fathers with one fertility partner to report not providing financial support to, or sharing their surname with, at least one of their biological children.

CONCLUSION: Multipartner fertility is a critical demographic and social phenomenon that may contribute to and reflect important gender and family structure inequalities in Nicaragua. Mothers with multipartner fertility may be at especially high risk of raising children without the children's fathers and with low levels of economic support.

International Perspectives on Sexual and Reproductive Health, 2017, 43(1): 29–38, <https://doi.org/10.1363/43e3317>

By Kammi K. Schmeer and Jack Hays

Kammi K. Schmeer is associate professor, and Jack Hays is a graduate student, Department of Sociology, The Ohio State University, Columbus, OH, USA.

The process of family formation has changed dramatically during the past 40 years, as levels of nonmarital childbearing, cohabitation and union dissolution have increased around the world.¹ One consequence of these demographic changes is increasing rates of multipartner fertility, or having children with more than one partner. Multipartner fertility has emerged as a focus of demographic research, particularly in the United States and other developed countries.

Although research indicates that these trends in nonmarital childbearing and union instability are also occurring in developing countries,² little is known about multipartner fertility in these settings. This study begins to address this gap by examining multipartner fertility in Nicaragua, a Latin American country where 45% of the population lives on less than US\$1 per day.³ Although childbearing in Latin America traditionally has occurred within stable unions, recent research suggests that, throughout the region, unions are increasingly unstable² and the proportion of births that occur outside of marriage is rising.⁴ In this context, multipartner fertility is a potentially important and understudied aspect of family formation.

To advance our understanding of multipartner fertility in a low-income country, we pose the following research questions: What are the rates of multipartner fertility

among mothers and fathers in Nicaragua? How are individual sociodemographic characteristics associated with such fertility? Finally, how do the current family characteristics of mothers and fathers with a history of multipartner fertility differ from the family characteristics of those with only one fertility partner?

We address these questions using national data from the 2011–2012 Encuesta Nicaragüense de Demografía y Salud (ENDESA),* which asked women and men about their fertility partners, socioeconomic status and family structure. We focus on Nicaragua because of the country's relatively high rates of union dissolution and early childbearing, events that potentially set individuals on a path toward multipartner fertility. The 2011/2012 RHS is unique in that it offers national data with direct assessments of multipartner fertility among women and men in a low-income setting. Our ability to assess multipartner fertility among both sexes improves our understanding of the full extent of multipartner fertility, and facilitates the study of gender differences in such fertility and its correlates.

*This survey is not part of either the Demographic and Health Survey (DHS) series or the Centers for Disease Control's Reproductive Health Survey series, but is more closely related to the latter. To avoid confusion, it will be referred to in this article as the 2011–2012 ENDESA.

BACKGROUND

Union Formation and Fertility in Latin America

In the low- and middle-income countries of Latin America, union formation encompasses two types of partnerships: cohabiting (nonmarital) unions and marriages. Marriage remains a culturally valued and stable family institution,⁵ but cohabitation is common and is considered a socially acceptable alternative within which childbearing often occurs.⁶ Cohabitation rates are on the rise in the region, and are particularly high in Central America and the Caribbean. The prevalence is highest in the Dominican Republic, where 41% of women aged 20–29 are in cohabiting unions.⁷

As cohabitation rates increase, the historic tradition of stable unions is waning, as union instability and the formation of second unions are becoming more typical family experiences in Latin America. A study using Demographic and Health Survey (DHS) data found that the proportion of mothers who had been continuously in their first union was lower in Latin America (60%) than in Africa (76%), Asia (94%) and the Middle East (95%).² Furthermore, recent research has found that nonmarital unions are less stable in Central America than in the rest of Latin America. The proportion of cohabiting women aged 25–49 who have been in one or more prior unions is estimated to be 25% in Guatemala, 38% in Honduras and 47% in Nicaragua.⁸

Fertility patterns reflect these changes in family formation that have occurred during the past few decades. Between 1970 and 2000, the proportion of births in Latin America that occurred among cohabiting women increased from 17% to 35%, and the proportion that occurred among unpartnered women rose from 7% to 15%.⁹ Thus, nonmarital fertility accounts for a growing portion of total fertility across Latin American countries.⁴

Fertility, Unions and Gender in Nicaragua

Nicaragua is one of the poorer countries in Latin America. Its total fertility rate has declined to 2.4 children per woman, but most families have at least two children and a significant portion have three or more, especially in rural areas.¹⁰ Motherhood is highly valued in the culture, which contributes to early and nearly universal childbearing.¹¹ Nicaragua has one of the highest adolescent fertility rates in the region, despite social norms that discourage premarital sex, particularly among women.^{12,13} Female sterilization is the most commonly used contraceptive method among women; use of reversible methods during prime childbearing years is low.¹⁰ First births occur early in the life course, at an average age of 19; an estimated 23% of women aged 15–19 are already mothers or pregnant with their first child,¹⁰ and 45% of teenage pregnancies are unplanned.¹¹ Abortion is illegal under all circumstances.

Early age at first sex results not only in early pregnancies, but also in early union formation.⁸ Among women, first unions (marriage or cohabitation) occur at an average

age of 17 in Nicaragua.¹⁰ Cohabitation is common, both early and later in life: Thirty-three percent of women aged 15–24 and 44% of women aged 25–45 were in a cohabiting union, according to data from the 2001 DHS.⁸ These unions are often unstable, resulting in higher dissolution rates for cohabiting relationships than for marital ones.⁸ The combination of early (and often unplanned) childbearing and unstable unions suggests that multipartner fertility is likely to be an important aspect of women's and men's fertility experiences in Nicaragua.

In addition to hypothesizing that multipartner fertility is a common family formation pattern in Nicaragua, we investigate whether gender differences exist in multipartner fertility rates. Gender differences in multipartner fertility may be particularly salient in settings like Nicaragua where, compared with men, women have less control over reproduction^{14,15} and less power in sexual partnerships¹² and unions.¹⁶ *Machismo*—the societal expectation of masculinity and virility in men—encourages male sexual activity at a young age in Nicaragua;⁷ in contrast, the Virgin Mary syndrome, or societal belief in a pure mother,¹² puts young Nicaraguan women in the precarious position of feeling pressure from men to engage in sex, but pressure from society to remain abstinent.¹⁷ Furthermore, because of traditional caregiver norms in Central America,¹⁸ men may spend less time and money on their children than women do, and, as a result of their lower social and economic costs, may be more likely than women to engage in multipartner fertility.

Sociodemographic Characteristics and Multipartner Fertility

In addition to studying multipartner fertility rates, we investigate whether and how individuals' sociodemographic characteristics are associated with their risk of multipartner fertility. We consider educational attainment, indigenous status, having grown up in an urban area and religious affiliation as potential predictors of multipartner fertility among women and men.

Although research on the relationship between education and multipartner fertility in developing countries is lacking, we hypothesize, on the basis of evidence from developed countries,¹⁹ that women with lower levels of education are more likely than their better educated counterparts to have children with multiple partners. This is likely to be the case in Nicaragua, given the earlier ages at first sex and first union²⁰ and the lower levels of contraceptive use²¹ among individuals with less education. These associations may differ by sex. Although rates of school enrollment among Nicaraguan women are equal to or greater than those among men,²² women with little education may be more inclined than men with little education to form a fertility partnership for economic or other support.

In Nicaragua and elsewhere in Latin America, indigenous groups are among the most marginalized and socioeconomically deprived populations.²³ Little research is available on union and fertility patterns among Nicaragua's indigenous groups, who make up only 5% of the country's

population.²³ Indigenous women in Nicaragua appear to be slightly more likely to cohabit than to marry;²⁴ however, cohabiting unions are not necessarily as unstable in indigenous populations as they are in nonindigenous groups.²⁵ Moreover, if indigenous individuals form unions primarily with members of their own ethnic group, the number of potential partners available may be limited. Thus, despite their lower socioeconomic status, multipartner fertility may be lower among indigenous than nonindigenous women and men.

We also consider whether having grown up in a rural or urban setting is related to risk of multipartner fertility. In Nicaragua, as well as elsewhere in Latin America, rates of contraceptive use are lower in rural areas than in urban ones^{20,21} and rural women are more likely than urban women to become mothers at an early age (in part because of their lower levels of education).¹¹ However, other evidence suggests that urban adolescents in Nicaragua have earlier ages at first sex and first union than do their rural counterparts.²⁰ Furthermore, growing up in an urban area may provide more opportunities to find sexual partners, increasing the risk of multipartner fertility over the life course. Given that rural and urban areas pose different (and potentially opposing) risks for multipartner fertility, it is not clear a priori which setting will be associated with higher multipartner fertility.

Finally, we consider an individual's religion (whether he or she is a member of a religious group) to be a potential predictor of multipartner fertility, although the likely direction of any association is unclear. On the one hand, Catholicism (the predominant religion in Nicaragua) and other religions discourage divorce and remarriage, which may reduce multipartner fertility among religious women and men. At the same time, the religious environment in Nicaragua discourages the use of contraceptives and abortion and encourages early parenthood, particularly among females.^{12,14} The situation may be different among males, as one study found that in poor areas of Managua, Catholic boys aged 13–18 were more likely than their counterparts who were nonreligious or belonged to other religions to report consistent condom use.¹³ Thus, relative to other individuals, those who belong to a religion may have a reduced risk of multipartner fertility if they are more likely to remain in union with their first fertility partner, or an elevated risk if they have less control over their fertility. Moreover, the relationship between religion and fertility among women is likely to differ from that among men.

Multipartner Fertility and Family Characteristics

As a final research question, we ask whether having a history of multipartner fertility is associated with women's and men's current family social structure and economic status. In particular, we are interested in household wealth, marital status, number of children ever born and the absence of biological children in the household.

U.S. research suggests that multipartner fertility has potentially important consequences for family structure, and that these consequences may differ by gender. For example, among young adults, 87% of women with multiple fertility partners, but only 13% of such men, lived with all of their biological children, and only 7% of men aged 40–44 who reported multipartner fertility resided with all of their children.²⁶

We know little about the family and household structure of mothers and fathers who have children with multiple partners in low-income countries. In Latin America, female household heads who have a child in the home are more likely to be poor than male household heads with a child in the home.²⁷ This suggests that if mothers who have experienced multipartner fertility are more likely than men who have experienced multipartner fertility to be single parents, then they may also be more likely than their male counterparts to be economically disadvantaged and live in a low-wealth household.

Given that multipartner fertility involves having children with more than one partner, we expect it to be positively associated with number of children ever born among both mothers and fathers. However, the association between multipartner fertility and number of children may be stronger among men than among women. As we suggested earlier, the temporal, emotional and economic burdens of child care rest on mothers if fathers leave, which may provide additional motivation for women to prevent subsequent births. On the other hand, fathers who have had multiple fertility partners may underreport their number of children (particularly those from early and nonmarital relationships), as has been observed among men in the United States.²⁸ In this case, the gender difference in any association between multipartner fertility and total number of births may be attenuated.

Finally, we expect mothers and fathers who have had multiple fertility partners to be more likely than other parents to live apart from at least one of their biological children as they form families with new partners. This may be especially true for fathers, as an estimated 44% of Nicaraguan children do not live with their father.¹⁰

METHODS

Data

The data used in this study come from the 2011–2012 ENDESA. The ENDESA, like the 2001 NDHS and the 2006 Nicaragua Reproductive Health Survey, was designed to provide national, regional and departmental estimates of fertility, reproductive health and health behaviors among women aged 15–49. Men aged 15–59 were surveyed for the first time in 2011, allowing for study of male fertility and reproductive health. The full sample consisted of 15,253 women and 4,493 men; we limited our study to the 8,320 mothers and 2,141 fathers who had two or more

children, because they constitute the population at risk for multipartner fertility.

Measures

- **Multipartner fertility.** The survey asked respondents about their biological children and included a question that can be translated as “Were all of your children from the same mother?” or “...same father?” Those who reported having had children with more than one partner were asked the number of such partners. These data allowed us to estimate the prevalence of multipartner fertility and the average number of partners reported.

- **Sociodemographic characteristics.** We also created variables for individual characteristics that may be associated with multipartner fertility. Educational attainment (the highest level of completed formal schooling) was categorized as none or primary, as secondary or as more than secondary. Indigenous status was a dummy variable indicating whether the respondent reported belonging to any indigenous group. Urban residence during childhood was defined as having lived mainly in a town or city before age 12. Another dummy variable indicated whether individuals belonged to any religion. Finally, we included variables for age, age at first sex and age at first union (cohabiting or marital), all measured in years, to control for cohort differences and for differences in the length of time respondents were at risk for early sex and early union formation.

- **Family characteristics.** We hypothesized that having a history of multipartner fertility would be associated with outcomes in respondents’ current families. To capture current family characteristics, we included variables for household wealth, union status, number of children ever born and having any nonresident children. To measure wealth, we conducted a principal components analysis of respondents’ number of assets and housing quality to create a household wealth score²⁹ that we dichotomized to yield a measure of low wealth (scores below the sample median). Union status was categorized as married, cohabiting or none (i.e., no residential partner). We created a categorical measure of number of children ever born (two, three, four, or five or more) on the basis of the number of live births the respondent reported. Finally, for female respondents, we created a dummy variable indicating whether the mother had a nonresident child (one who did not live in the household). This outcome could not be modeled for men, because 96% of fathers who reported multipartner fertility had at least one child living outside of the household. Instead, we created a dummy variable indicating whether fathers had at least one unsupported child; they were considered to have such a child if they reported that one or more of their biological children did not have their last name or had never received economic support from them.

Analyses

To estimate the prevalence of multipartner fertility among Nicaraguan men and women with at least two children, we calculated the percentage of these individuals who reported

having more than one fertility partner. This direct approach is preferable to and more accurate than indirect methods that require piecing together union and birth histories.²⁶ We also calculated weighted descriptive statistics, separately by gender, of sociodemographic and other characteristics of women and men with one or multiple fertility partners.

Next, we conducted logistic regression analyses to identify associations between sociodemographic characteristics and multipartner fertility. Separate models were conducted for women and men; all adjusted for current age, and secondary models adjusted for age at first sex and age at first union.

In our final sets of regression models, we examined whether multipartner fertility was associated with current family characteristics. We used logistic regression when the dependent variable was a dummy variable (i.e., low wealth, having a nonresident or unsupported child) and multinomial logistic regression when the dependent variable was categorical (union status, number of children). Analyses were conducted separately for each outcome and separately by gender; all models adjusted for sociodemographic characteristics.

In calculating descriptive statistics and performing regression analyses, we accounted for the survey design and unequal probability of selection using individual weights and the *svy* command in Stata. We present the results of regression analyses as odds ratios, relative risk ratios and standard errors; statistical significance was set at $p < .05$.

RESULTS

Overall, 33% of mothers and 41% of fathers with two or more children reported multipartner fertility. Among those who had had children with multiple partners, 19% of mothers and 30% of fathers reported having had children with three or more partners (Table 1).

The fertility and union histories of men and women who had had multiple fertility partners differed from those of parents who had had two or more children with only one partner. Compared with their counterparts who had had one fertility partner, mothers and fathers reporting multiple fertility partners had a greater number of live births, had a lower age at first sex and were more likely to have been in more than one union. In addition, fathers who had had children with multiple partners had a younger mean age at first union than did fathers with a single fertility partner, although no difference in age at first union by number of fertility partners was evident among mothers.

Sociodemographic characteristics also differed by number of fertility partners. Compared with mothers with one fertility partner, those with two or more fertility partners were older, more likely to have no more than a primary education and more likely to have grown up in an urban area. The two groups did not differ by indigenous status or religious affiliation.

In contrast to the findings among mothers, fathers who reported multipartner fertility were more likely than those with a single fertility partner to have at least a secondary

education and to not belong to a religion. However, as was the case among mothers, fathers who had had multiple fertility partners were more likely to have grown up in an urban area.

Finally, the descriptive statistics indicate that current family contexts differed between individuals with a history of multipartner fertility and those who had had births with a single partner. Among mothers, those with two or more fertility partners had a lower mean number of household assets and a lower prevalence of marriage (18% vs. 40%) than did mothers with only one fertility partner. Conversely, fathers with multipartner fertility had a higher mean number of household assets than did fathers with a single fertility partner. Although fathers with multiple fertility partners were, like their female counterparts, less likely than those with a single fertility partner to be married (39% vs. 57%), they had a higher prevalence of marriage than did mothers who reported multipartner fertility (39% vs. 18%).

Among both mothers and fathers, those with multiple fertility partners had more children than did those with one fertility partner; 29% of mothers and 40% of fathers with multipartner fertility reported having five or more children. While 31% of mothers in the multipartner fertility group had a nonresident biological child, virtually all fathers with multiple fertility partners had such a child (96%). Furthermore, 56% of fathers with multipartner fertility, but only 17% of those with a single fertility partner, indicated that at least one of their biological children had a different last name or did not receive any economic support from them.

In the multivariate regression analyses, we first examined whether mothers' and fathers' individual sociodemographic characteristics were associated with multipartner fertility. The first model for women shows that education level was an important predictor of multipartner fertility among mothers with two or more children (model 1, Table 2); the likelihood of multipartner fertility was greater among those with no more than a primary education (odds ratio, 1.8) and those with a secondary education (1.4) than among those with more than a secondary education. Having grown up in an urban area also was associated with an increased risk of multipartner fertility (1.6), and there was a small, positive association between age and having had multiple fertility partners.

In the second model we adjusted for age at first sex, and found that the odds of multipartner fertility were reduced by 15% for each additional year that women delayed first intercourse. Furthermore, inclusion of age at first sex in the model attenuated the associations between education and multipartner fertility, which became nonsignificant. Unlike age at first sex, age at first union was not associated with multipartner fertility and did not attenuate the association between education and multipartner fertility among mothers (model 3).

In the first regression model examining predictors of multipartner fertility among fathers with two or more children, we found two notable differences from the

TABLE 1. Selected characteristics of mothers aged 15–49 and fathers aged 15–59 with at least two children, by number of fertility partners, 2011–2012 ENDESA

Measure	Mothers		Fathers	
	1 partner (N=5,707)	≥2 partners (N=2,613)	1 partner (N=1,236)	≥2 partners (N=905)
Fertility/union history				
Mean no. of fertility partners	1.0	2.3*	1.0	2.5*
Has had 2 fertility partners	na	81	na	70
Has had ≥3 fertility partners	na	19	na	30
Mean no. of live births	3.3	3.9*	3.4	4.4*
Mean age at first sex	16.8	15.7*	15.8	15.0*
Mean age at first union†	17.7	17.8	21.3	20.6*
Has been in >1 union†	9	73*	15	74*
Sociodemographic characteristics				
Mean age	35	37*	40	41*
Education				
None/primary	57	62*	63	52*
Secondary	28	27	23	31*
>secondary	15	11*	14	18*
Indigenous	15	16	16	15
No religion	10	11	18	23*
Grew up in urban area	59	66*	52	63*
Current family characteristics				
Mean no. of household assets (range, 0–22)	6.6	6.1*	6.4	6.9*
Married	40	18*	57	39*
Cohabiting	43	46*	33	44*
Divorced/separated/widowed	16	33*	10	16*
Never in union	1	3*	1	0
No. of children				
2	43	26*	43	21*
3	26	25*	23	20
4	12	20*	12	19*
≥5	18	29*	22	40*
Mean no. of own children in household	2.6	2.6	2.6	2.1*
Has ≥1 nonresident child	15	31*	37	96*
Has ≥1 unsupported child‡	na	na	17	56*

*Significantly different from value for single-partner group at $p < .05$. †Among those ever in a union. ‡Asked only of fathers. Notes: All values are percentages unless otherwise indicated. All data are weighted. na=not applicable.

corresponding model for mothers (model 1). First, we found no association between education level and multipartner fertility among fathers. Second, having no religious affiliation was associated with a 43% increase in the odds of multipartner fertility among fathers. Consistent with what was found among mothers, fathers who had grown up in an urban area had higher odds of multipartner fertility than did those from rural areas (odds ratio, 1.4).

In the second model for fathers, we found that delaying first sex and delaying first union were both associated with reduced odds of multipartner fertility (odds ratios, 0.90 and 0.96 per year, respectively). The odds ratio for age at first sex was similar in magnitude to that among mothers; although among mothers the inclusion of this variable attenuated the association between education and multipartner fertility, among fathers its inclusion (together with age at first union) did not alter the nonsignificant relationship between education and multipartner fertility, though it did slightly attenuate the association between having grown up in an urban area and multipartner fertility.

In analyses examining associations between multipartner fertility and current family characteristics among mothers (Table 3), women with a history of multipartner

fertility were more likely than those with a single fertility partner to live in a low-wealth household (odds ratio, 1.2) and to be single (relative risk ratio, 4.8) or cohabiting (2.5) rather than married. As expected, multipartner fertility was also associated with number of children; compared with mothers who had a single fertility partner, those who had had multiple fertility partners were more likely to have had three, four, or five or more live births rather than two (relative risk ratios, 1.3–2.2). Finally, mothers with multiple fertility partners were significantly more likely than mothers with a single fertility partner to have at least one nonresident biological child (odds ratio, 1.9). These associations were estimated net of the predictors of multipartner fertility modeled in Table 2.

Table 4 presents the results of the regression analyses of associations between multipartner fertility and current family conditions among fathers with two or more children. In contrast to the findings for mothers, multipartner fertility among fathers was associated with reduced odds of living in a low-wealth household (odds ratio, 0.7), net of education and other confounders. Multipartner fertility was also associated with an increased likelihood of fathers being single (relative risk ratio, 2.3) or cohabiting (2.2) rather than being married. Although this is consistent with the findings for mothers, the risk of living as a single parent among fathers with multiple fertility partners was lower than that found among mothers with multiple

TABLE 2. Odds ratios (and robust standard errors) from weighted logistic regression analyses examining associations between selected characteristics and multipartner fertility among respondents with at least two children, by gender

Characteristic	Mothers' multipartner fertility			Fathers' multipartner fertility	
	Model 1	Model 2	Model 3	Model 1	Model 2
Education					
None/primary	1.80 (0.19)**	1.10 (0.12)	1.81 (0.20)**	0.83 (0.15)	0.76 (0.14)
Secondary	1.37 (0.14)**	1.05 (0.11)	1.36 (0.14)**	1.17 (0.22)	1.08 (0.21)
>secondary (ref)	1.00	1.00	1.00	1.00	1.00
Indigenous					
Yes	1.09 (0.09)	1.03 (0.08)	1.07 (0.09)	0.98 (0.15)	0.97 (0.15)
No (ref)	1.00	1.00	1.00	1.00	1.00
Grew up in urban area					
Yes	1.56 (0.10)**	1.50 (0.10)**	1.57 (0.11)**	1.40 (0.18)**	1.30 (0.17)*
No (ref)	1.00	1.00	1.00	1.00	1.00
Religion					
No	1.20 (0.12)	1.17 (0.12)	1.28 (0.13)*	1.43 (0.23)*	1.41 (0.23)*
Yes (ref)	1.00	1.00	1.00	1.00	1.00
Age	1.03 (0.00)**	1.04 (0.00)**	1.03 (0.00)**	1.01* (0.01)*	1.02 (0.01)**
Age at first sex	na	0.85 (0.01)**	na	na	0.90 (0.02)**
Age at first union†	na	na	1.00 (0.01)	na	0.96 (0.01)**

*p<.05. **p<.01. †Age at first sex and age at first union were too highly correlated among women (r=0.7) to include both in models simultaneously. Among fathers, the correlation was lower (r=0.3), allowing us to include the two variables in the same model. Note: na=not applicable.

TABLE 3. Odds ratios and relative risk ratios (and robust standard errors) from weighted regression models examining associations between multipartner fertility and current family economic and social structure among mothers with at least two children

Measure	Mother lives in low-wealth household	Mother's union status (ref: married)		No. of children ever born to mother (ref: 2)			Mother has any nonresident children
		No partner	Cohabiting	3	4	≥5	
Multipartner fertility							
Yes	1.23 (0.11)*	4.78 (0.44)**	2.48 (0.22)**	1.32 (0.12)**	2.16 (0.20)**	1.97** (0.21)	1.93 (0.18)**
No (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
COVARIATES							
Age	0.95 (0.00)**	0.99 (0.01)	0.95 (0.00)**	1.12 (0.01)**	1.20 (0.01)**	1.33 (0.01)**	1.23 (0.01)**
Education							
None/primary	14.00 (2.02)**	0.96 (0.12)	1.82 (0.21)**	2.23 (0.31)**	5.12 (0.92)**	19.40 (5.57)**	3.86 (0.69)**
Secondary	3.00 (0.42)**	1.10 (0.14)	1.42 (0.18)**	1.60 (0.19)**	2.61 (0.45)**	4.33 (1.35)**	1.81 (0.33)**
>secondary (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Indigenous							
Yes	1.20 (0.14)	0.86 (0.11)	0.96 (0.11)	1.35 (0.14)**	1.76 (0.23)**	2.42 (0.41)**	1.18 (0.18)
No (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Grew up in urban area							
Yes	0.23 (0.02)**	1.28 (0.13)*	1.13 (0.09)	0.97 (0.08)	0.74 (0.09)*	0.52 (0.06)**	0.72 (0.07)**
No (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Religion							
No	0.93 (0.10)	2.41 (0.43)**	2.79 (0.38)**	0.72 (0.09)**	0.65 (0.12)*	0.69 (0.12)*	1.14 (0.16)
Yes (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Age at first sex	0.99 (0.01)	1.01 (0.01)	0.98 (0.01)	0.85 (0.01)**	0.75 (0.01)**	0.67 (0.01)**	0.77 (0.02)**

*p<.05. **p<.01. Notes: Models assessing associations with low wealth and having a nonresident child are logistic regression models whose results are presented as odds ratios; models assessing associations with union status and number of children ever born are multinomial logistic regression models whose results are presented as relative risk ratios. Age at first sex and age at first union were too highly correlated (r=0.7) for both to be included in the models. ref=reference category.

TABLE 4. Odds ratios and relative risk ratios (and robust standard errors) from weighted regression models examining associations between multipartner fertility and current family economic and social structure among fathers with at least two children

Measure	Father in low-wealth household	Father's union status (ref: married)		Children ever born to father (ref: 2)			Father has any unsupported children
		No partner	Cohabiting	3	4	≥5	
Multipartner fertility							
Yes	0.74 (0.11)*	2.27 (0.46)**	2.18 (0.28)**	2.01 (0.35)**	4.29 (0.86)**	5.86 (1.20)**	6.43 (0.92)**
No (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
COVARIATES							
Age	0.99 (0.01)	0.99 (0.01)	0.96 (0.01)**	1.08 (0.01)**	1.14 (0.02)**	1.24 (0.02)**	1.08 (0.01)**
Education							
None/primary	15.40 (4.60)**	1.04 (0.30)	3.15 (0.68)**	1.49 (0.41)	1.73 (0.57)	3.23 (1.05)**	1.82 (0.44)*
Secondary education	3.20 (0.96)**	1.42 (0.39)	2.15 (0.46)**	1.40 (0.37)	1.49 (0.48)	1.62 (0.60)	1.54 (0.37)
>secondary (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Indigenous							
Yes	1.82 (0.43)*	1.18 (0.31)	1.04 (0.20)	1.09 (0.23)	1.01 (0.31)	1.15 (0.35)	1.30 (0.22)
No (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Grew up in urban area							
Yes	0.26 (0.04)**	1.44 (0.32)	1.21 (0.17)	0.82 (0.14)	0.57 (0.13)*	0.49 (0.10)**	1.16 (0.19)
No (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Religion							
No	0.85 (0.18)	1.65 (0.40)*	1.82 (0.28)**	0.90 (0.18)	0.70 (0.15)	0.80 (0.19)	1.32 (0.27)
Yes (ref)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Age at first sex							
	0.98 (0.02)	0.96 (0.03)	1.00 (0.02)	0.96 (0.03)	0.94 (0.03)	0.97 (0.036)	0.95 (0.02)
Age at first union							
	0.98 (0.02)	1.00 (0.02)	0.95 (0.02)**	0.92 (0.02)**	0.89 (0.02)**	0.83 (0.02)**	0.98 (0.02)

*p<.05. **p<.01. Notes: Models assessing associations with low wealth and having a nonresident child are logistic regression models whose results are presented as odds ratios; models assessing associations with union status and number of children ever born are multinomial logistic regression models whose results are presented as relative risk ratios. ref=reference category.

fertility partners (relative risk ratios, 2.3 for fathers vs. 4.8 for mothers).

Fathers' reported number of children was higher among those with multiple fertility partners rather than a single fertility partner: Fathers with multiple fertility partners had an elevated risk of having three, four, or five or more children rather than two (relative risk ratios, 2.0–5.9). The association between multipartner fertility and having a large family was stronger among men than among women, both for having four children (4.3 vs. 2.2) and for having five or more (5.9 vs. 2.0).

Finally, fathers with multiple fertility partners were more likely than those with a single fertility partner to have at least one child who did not share the father's surname or receive economic support from him (odds ratio, 6.4). Supplementary models indicated that this association held even after adjustment for number of children born to the father.

DISCUSSION

In this article, we provide new national data on the prevalence of multipartner fertility among women and men in Nicaragua, a low-income country with relatively high rates of early childbearing and union instability. Our results indicate that multipartner fertility is an important demographic process in Nicaragua: Among individuals with multiple offspring, 33% of mothers and 41% of fathers

reported having had children with multiple partners. Although recent research has found that union instability^{2,8} and nonmarital births⁹ are increasingly important sources of family change in Latin America, we add another dimension to understanding recent family formation trends by showing that fertility is occurring across multiple partnerships in Nicaragua. This is likely to be an important aspect of fertility and family formation in other Latin American countries with similar patterns of union instability and fertility.

A second contribution of this study is that it illustrates gender differences in multipartner fertility rates. We found multipartner fertility to be more common among men. Also notable is that among individuals with multiple fertility partners, the proportion who reported having had children with three or more partners was higher among fathers (30%) than among mothers (19%). Given that a sizeable proportion of Nicaraguan men father children across three or more families, and that 96% of fathers with multiple fertility partners reported having at least one biological child who did not live with them, many youth whose fathers have had children with multiple women are likely to live without their biological fathers and in complex family structures.

In addition to estimating multipartner fertility rates, we provided an initial view of individuals' sociodemographic characteristics associated with multipartner fertility, as

well as gender differences in these associations. One key finding was that low levels of education were associated with an increased likelihood of multipartner fertility among mothers, indicating that socially disadvantaged women have an elevated risk of having children with more than one partner. Furthermore, this association was no longer statistically significant when we adjusted for age at first sex, suggesting that less-educated women may be at increased risk of multipartner fertility because of their earlier age at first intercourse. No association between education level and multipartner fertility was evident for fathers, however.

We found that having grown up in an urban area was associated with an elevated risk of multipartner fertility among both mothers and fathers. These findings are consistent with research indicating that Nicaraguan adolescents in urban areas have earlier ages at first sex and first union than do their rural counterparts.²⁰ However, having grown up in a town or city was associated with multipartner fertility even after adjustment for age at first sex and age at first union, suggesting that other factors (such as greater availability of partners) may be fostering multipartner fertility among individuals growing up in urban areas.

Having a religious affiliation was associated with reduced odds of multipartner fertility among fathers, possibly because Catholicism discourages or prohibits premarital sex and divorce. Nonreligious men may be more willing than others to risk nonmarital childbearing or to leave partnerships after having children. The association may also partially reflect higher levels of consistent condom use among young men who are Catholic than among other youth.¹³ However, religion was not associated with multipartner fertility among mothers, except in the analysis that adjusted for age at first union, which found an elevated risk of multipartner fertility among nonreligious women. The relationship between religion and multipartner fertility should be further examined in low-income settings to better understand whether and how religion may reduce childbearing with multiple partners.

As we had expected, early first sexual experience was associated with multipartner fertility among both mothers and fathers. Having sex at an early age puts individuals at risk of having an early first birth, especially in a setting such as Nicaragua, where the level of contraceptive use is low¹⁰ and abortion is illegal.¹¹ Early births may tend to be nonmarital or to result in short-term partnerships that leave women and men seeking other partners with whom they have subsequent children.

Early age at first union was also associated with multipartner fertility among fathers, but not among mothers, suggesting that early union formation may lead men to unstable union trajectories and perhaps, eventually, to having other fertility partners. The gender difference may reflect men's greater likelihood (relative to women) of leaving a first union despite having had a child.

Our final research question asked whether having a history of multipartner fertility is associated with mothers' and fathers' current family characteristics. Our results demonstrated that mothers (but not fathers) with multiple fertility partners have an elevated likelihood of living in a low-wealth household, even after adjustment for education level and other characteristics. Conversely, multipartner fertility was associated with reduced odds of poverty among fathers. This suggests that fathers who have had children with multiple partners may choose to stay in households where they have fewer financial burdens (perhaps fewer children or other dependents) or more financial assets (higher family income or wealth). On the other hand, mothers with multiple fertility partners may be more likely than other women to end up in households with a large number of children, with a partner with poor economic prospects or with no partner to provide economic support.

In addition, multipartner fertility was associated with an increased risk of single parenthood. This likely reflects that the unions of individuals who have had children with multiple partners are more unstable than those of other parents. The association between multipartner fertility and single parenthood was notably stronger among mothers than among fathers, perhaps in part because social norms that favor a "pure" woman make it more difficult for women with children to find subsequent partners.¹²

Our results also suggest that multipartner fertility may have important implications for total fertility rates, as multipartner fertility was associated with an increased risk of having three, four, or five or more children. The associations were particularly strong among fathers, whose odds of having four children or having five or more children were elevated four- to six-fold if they had multiple fertility partners. Although the gender differences in the strength of these associations are related, in part, to the higher number of fertility partners among men than women, gender norms of male virility also may encourage particularly high fertility among men with multiple fertility partners.³⁰ Furthermore, women who have had multiple fertility partners (and thus likely have one or more children with absent fathers) may make more of an effort to control their subsequent fertility. Fathers, on the other hand, are more likely to leave children to live with their mothers, lessening the cost of childbearing with a new partner.

Indeed, our findings indicated that multipartner fertility was associated with a reduced likelihood of living with all of one's biological children (particularly among fathers); moreover, the odds that a father was not supporting or did not have same surname as at least one of his children were elevated more than sixfold if he had had multiple fertility partners. This suggests that multipartner fertility increases children's exposure to complex family structures and absent parents (especially fathers). Such is the case in the United States, where fathers with multipartner fertility tend to be less involved with their children than men with only one fertility partner.²⁶

Several limitations of this study should be noted. Because our data are cross-sectional, we were unable to specify how fertility and union partnerships formed and dissolved or to establish the temporal order of variables associated with multipartner fertility. Furthermore, we could not adjust for many potential sources of selectivity bias. As a result, the associations we identified should not be considered causal relationships. Additional research is needed to more fully understand how multipartner fertility operates in Nicaragua and its potential consequences for parents and their children.

In addition, retrospective data, such as that provided by the ENDESA, may not provide accurate reports of births; in U.S. studies, underreporting has been particularly problematic in assessment of fertility (especially nonmarital fertility) among men.²⁸ However, it is not clear that underreporting is an issue in Nicaragua. A relatively large proportion of men reported that they did not share their last name with, or provide economic support to, at least one child, suggesting that they knew about the birth even if they were not supporting the child. Moreover, the high rate of male incarceration in the United States, which could account for some of the missed births in that country,²⁸ is not an issue in Nicaragua. Nonetheless, if male fertility is underreported, the prevalence and consequences of multipartner fertility could be even greater than that reported here.

Notwithstanding these limitations, this article is one of the first to provide sociodemographic characteristics and family outcomes associated with multipartner fertility among women and men in a low-income country. Our findings indicate that multipartner fertility is a pressing issue in Nicaragua. It occurs at high rates among both men and women and across social groups. The gender differences in the predictors and outcomes of multipartner fertility suggest that mothers may be at particularly high risk of not only having to raise children without the other biological parent, but having to do so with fewer economic resources than mothers with only one fertility partner have. Multipartner fertility also may contribute to the ongoing problem of adolescent pregnancy in Nicaragua, given evidence that young women who do not live with their biological father during childhood and adolescence have earlier ages at first sex and first pregnancy.³¹

In short, our findings indicate a need to understand multipartner fertility as a demographic and social process that contributes to and reflects important gender and family-structure inequalities in Nicaragua, and that may influence fertility and family structure trends. Future research should examine multipartner fertility in other low- and middle-income countries, and should explore how such fertility may affect individual and family well-being in these settings.

REFERENCES

1. Child Trends, *World Family Map 2015: Mapping Family Change and Child Well-Being Outcomes*, Bethesda, MD, USA: Child Trends, 2015.

2. DeRose L et al., Family instability and early childhood health in the developing world, in: *World Family Map 2014: Mapping Family Change and Child Well-Being Outcomes*, Bethesda, MD, USA: Child Trends, 2014, pp. 48–63.

3. Sahley C et al., *The Governance Dimensions of Food Security in Nicaragua*, Washington, D.C.: U.S. Agency for International Development, 2005, http://pdf.usaid.gov/pdf_docs/PNADE106.pdf.

4. Laplante B et al., The contributions of childbearing within marriage and within consensual union to fertility in Latin America, 1980–2010, *Demographic Research*, 2016, 34(29):827–844.

5. Fussell E and Palloni A, Persistent marriage regimes in changing times, *Journal of Marriage and the Family*, 2004, 66(5):1201–1213.

6. Martin TC, Consensual unions in Latin America: persistence of a dual nuptiality system, *Journal of Comparative Family Studies*, 2002, 33(1):35–55.

7. Guzman JM et al., The demography of Latin America and the Caribbean since 1950, *Population*, 2006, 61(5–6):519–576.

8. Grace K and Sweeney S, Pathways to marriage and cohabitation in Central America, *Demographic Research*, 2014, 30(6):187–226.

9. Laplante B et al., Childbearing within marriage and consensual union in Latin America, 1980–2010, *Population and Development Review*, 2015, 41(1):85–108.

10. National Institute for Development Information and Ministry of Health, *Encuesta Nicaraguense de Demografía y Salud 2011/12: Informe Preliminar*, Managua, Nicaragua: National Institute for Development Information and Ministry of Health, 2013.

11. Blandón L et al., Early childbearing in Nicaragua: a continuing challenge, *Issues in Brief*, New York: Guttmacher Institute, 2006.

12. Berglund S et al., The background of adolescent pregnancies in Nicaragua: a qualitative approach, *Social Science & Medicine*, 1997, 44(1):1–12.

13. Decat P et al., Sexual onset and contraceptive use among adolescents from poor neighbourhoods in Managua, Nicaragua, *European Journal of Contraception & Reproductive Health Care*, 2015, 20(2):88–100.

14. Luffy SM, Evans DP and Rochat RW, “Siempre me critican”: barriers to reproductive health in Ocotol, Nicaragua, *Revista Panamericana de Salud Pública*, 2015, 37(4–5):245–250.

15. Salazar M and San Sebastian M, Violence against women and unintended pregnancies in Nicaragua: a population-based multilevel study, *BMC Women’s Health*, 2014, 14:26, doi: 10.1186/1472-6874-14-26.

16. Ellsberg M et al., Candies in hell: women’s experiences of violence in Nicaragua, *Social Science & Medicine*, 2000, 51(11):1595–1610.

17. Rani M, Figueroa ME and Ainsle R, The psychosocial context of young adult sexual behavior in Nicaragua: looking through the gender lens, *International Family Planning Perspectives*, 2003, 29(4):174–181.

18. Gibbons JL and Luna SE, For men life is hard, for women life is harder: gender roles in Central America, in: Safdar S and Kosakowska-Berezecka N, eds., *Psychology of Gender Through the Lens of Culture*, Cham, Switzerland: Springer, 2015, pp. 307–325.

19. Thomson E et al., Childbearing across partnerships in Australia, the United States, Norway, and Sweden, *Demography*, 2014, 51(2):485–508.

20. Samandari G and Speizer IS, Adolescent sexual behavior and reproductive outcomes in Central America: trends over the past two decades, *International Perspectives on Sexual and Reproductive Health*, 2010, 36(1):26–35.

21. Zelaya E et al., Contraceptive patterns among women and men in León, Nicaragua, *Contraception*, 1996, 54(6):359–365.

22. FHI360, *Nicaragua: National Education Profile 2014 Update*, Durham, NC, USA: FHI360, 2014, http://www.epdc.org/sites/default/files/documents/EPDC%20NEP_Nicaragua.pdf.

23. Montenegro RA and Stephens C, Indigenous health in Latin America and the Caribbean, *Lancet*, 2006, 367(9525):1859–1869.
24. Castro-Martín T and Domínguez-Rodríguez A, Consensual unions in Central America: historical continuities and new emerging patterns, in: Esteve A and Lesthaeghe RJ, eds., *Cohabitation and Marriage in the Americas: Geo-historical Legacies and New Trends*, New York: Springer International Publishing, 2016, pp. 157–185.
25. Covre-Sussai M et al., Traditional and modern cohabitation in Latin America: a comparative typology, *Demographic Research*, 2015, 32(32):873–914.
26. Guzzo KB and Dorius C, New approaches and methodological challenges to measuring multipartnered fertility in national surveys, 2014 *Working Paper Series*, Bowling Green, OH, USA: Center for Family and Demographic Research, 2014.
27. Liu C, Esteve A and Treviño R, Female-headed households and living conditions in Latin America, *World Development*, 2017, 90(1):311–328.
28. Joyner K et al., The quality of male fertility data in major U.S. surveys, *Demography*, 2012, 49(1):101–124.
29. Filmer D and Pritchett LH, Estimating wealth effects without expenditure data—or tears: an application to educational enrollments in states of India, *Demography*, 2001, 38(1):115–132.
30. Sternberg P, Challenging machismo: promoting sexual and reproductive health with Nicaraguan men, *Gender and Development*, 2000, 8(1):89–99.
31. Zelaya E et al., Gender and social differences in adolescent sexuality and reproduction in Nicaragua, *Journal of Adolescent Health*, 1997, 21(1):39–46.

RESUMEN

Contexto: La fecundidad multipareja (tener hijos con más de una pareja) es un tema importante en la investigación demográfica, pero se conoce poco acerca de su incidencia y correlatos en entornos de bajos ingresos, en donde las tasas pueden ser altas debido a la pobreza, la inestabilidad de las uniones y la maternidad temprana.

Métodos: Se usaron datos de la Encuesta Nicaragüense de Demografía y Salud 2011–2012 para calcular la prevalencia de la fecundidad multipareja en 8,320 madres y 2,141 padres con dos o más hijos. Se usó regresión logística y multinomial para identificar características individuales y familiares asociadas con la fecundidad multipareja.

Resultados: Entre quienes tenían múltiples hijos, 33% de las madres y 41% de los padres habían tenido hijos con más de una pareja. La prevalencia de la fecundidad multipareja fue alta entre mujeres con menor escolaridad, hombres no religiosos, así como en mujeres y hombres que habían crecido en áreas urbanas (razones de probabilidad, 1.3–1.6). La fecundidad multipareja se asoció, en las madres, con un más bajo nivel de riqueza actual en el hogar, y en las madres y los padres, con un mayor riesgo de paternidad en soltería y con una mayor fecundidad. Los padres que habían tenido hijos con múltiples parejas tuvieron seis veces más probabilidad que los padres con

una sola pareja de reportar que no proveían apoyo financiero, o que no compartían su apellido con al menos uno de sus hijos biológicos.

Conclusión: La fecundidad multipareja es un importante fenómeno demográfico y social que puede al mismo tiempo contribuir y ser un reflejo de importantes desigualdades de género y de estructura familiar en Nicaragua. En particular, las madres con hijos de múltiples parejas pueden correr un riesgo elevado de criar hijos sin la figura paterna, y de hacerlo con bajos niveles de apoyo económico.

RÉSUMÉ

Contexte: La fécondité en multipartenariat (avoir des enfants avec plus d'un ou d'une partenaire) représente un sujet important de la recherche démographique. On en sait cependant peu sur son incidence et ses corrélats dans les contextes à faible revenu, où les taux sont peut-être élevés du fait de la pauvreté, de l'instabilité des unions et de la parentalité précoce.

Méthodes: Les données du 2011–2012 Encuesta Nicaragüense de Demografía y Salud ont servi à calculer la prévalence de la fécondité en multipartenariat parmi 8 320 mères et 2 141 pères d'au moins deux enfants. Les caractéristiques individuelles et familiales associées à cette fécondité ont été identifiées par régression logistique et multinomiale.

Résultats: Parmi les mères et pères de plusieurs enfants, 33% des mères et 41% des pères avaient eu leurs enfants avec plus d'un ou d'une partenaire. La prévalence de la fécondité en multipartenariat s'est avérée élevée parmi les femmes moins instruites, les hommes non religieux et les femmes et hommes qui avaient grandi en milieu urbain (RC, 1,3–1,6). La fécondité en multipartenariat est associée à une moindre richesse actuelle du ménage chez les mères; à un risque accru de monoparentalité et à une fécondité supérieure chez les mères comme chez les pères. Les pères qui avaient eu plusieurs partenaires de fécondité se sont révélés six fois plus susceptibles que ceux qui n'en avaient qu'une de déclarer ne pas apporter d'assistance financière ou ne pas avoir donné leur nom de famille à au moins un de leurs enfants biologiques.

Conclusion: La fécondité en multipartenariat est un phénomène démographique et social critique susceptible de contribuer, tout en reflétant, à d'importantes inégalités de genre et de structure familiale au Nicaragua. Les mères d'enfants conçus avec plusieurs partenaires peuvent courir un risque particulièrement élevé d'avoir à élever ces enfants sans leur père et sans grande assistance économique.

Author contact: schmeer.1@osu.edu