Wanted and Unwanted Fertility in Bolivia: Does Ethnicity Matter?

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Abstract

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This study investigates wanted and unwanted fertility in Bolivia between Indigenous and non-Indigenous women. Indigenous women showed identical wanted fertility as non-Indigenous women but higher unwanted fertility. Differences in the total fertility rate between Indigenous and non-Indigenous women can, therefore, be entirely attributed to unwanted fertility and not fertility preferences. Results showed Indigenous women had higher percentages of unmet need, which can explain the unwanted fertility differentials. Wanted total fertility rate and unmet need are measured from women's preferences; however, men could increase unwanted fertility and unmet need by discouraging a partner not wanting a child from using contraceptives. I conducted couple analysis to see if male partners were influencing women's reproductive behavior and could account for the differentials in unwanted fertility. Analysis by logistic regressions indicated that men's influence explains only a small part of these differences.

Although there has been a rapid decline in Bolivia's Total Fertility Rate (TFR) over the past several decades, Indigenous populations have continually had higher rates of fertility than the non-Indigenous population. The Instituo Nacional de Estadistica reported a 6.9 TFR for the Indigenous population and 6.0 TFR for the non-Indigenous population in 1976 and more recently a 5.0 TFR for the Indigenous population and 3.6 for the non-Indigenous population in 2001 (Molina 2005). Estimates of the exact proportion of Indigenous people in Bolivia vary based on the definitional criteria but is usually estimated at over half of the population (Barrios 2005). Regardless of the exact proportion, the substantial size of the Indigenous population renders that any Indigenous specific trend can dramatically shape the demographic characteristics of Bolivia.

This study explores several possible explanations for higher fertility among the Indigenous population in Bolivia. Specifically, is the higher Indigenous fertility rate related to: (1) Indigenous women wanting larger families, (2) Indigenous women having higher levels of unwanted births, and/or (3) differences in male partner's influence on female partner's contraceptive use? Previous studies investigating wanted and unwanted fertility or couple reproductive behavior have overlooked ethnic differentials (Bankole & Singh 1998; Becker 1999; Blanc 1982; Bongaarts and Lightbourne 1996; Bongaarts 1997; Casterline, Perez, Biddlecom 1997; Ezeh 1993; Hakkert 2001; Mason & Smith 2000Westoff 1981; Westoff and Moreno 1996). This research concentrates on examining Indigenous and non-Indigenous ethnicity in order to better understand overall fertility trends in Bolivia.

In pre-transitional societies wanted fertility tends to be high which means that women could continually want additional children for the extent of their reproductive years and never be at risk for having unwanted births (Bongaarts 1997). As fertility preferences drop in transitioning societies, the length of time during which fecund women do not want more children increases, putting women at greater risk of unwanted fertility (Westoff 1981; Bongaarts 1997).

Many Latin American countries are moving through the early-transitional phase of the demographic transition during which fertility rates are declining but have not yet reached replacement levels, putting these countries at a high risk of unwanted fertility Blanc 1982; Westoff 1981; Westoff and Moreno 1996; Bongaarts and Lightbourne 1996; Bongaarts 1997; Hakkert 2001). Unwanted fertility rates are particularly high in Bolivia. In a comparative study of eight Latin American Countries, Westoff and Moreno (1996) found that Bolivia had the highest percentage of unwanted pregnancy at 44% with a TFR of 5.0 and a desired fertility rate of 2.8. A subsequent study estimated that 49% of Bolivian women at the end of their reproductive years surpassed their declared ideal family size (Hakkert 2001). Terborgh et.al. (1995) found that Indigenous women in Bolivia had an ideal number of children of 2.4 contrasting with a much larger TFR of 6.5.

Addressing unmet need with family planning has been identified as an important factor in eliminating unwanted fertility with helping to align total fertility with wanted fertility (Blanc 1982; Westoff 1981; Westoff and Moreno 1996; Bongaarts 1997). The probability of unwanted fertility rises when a fecund woman wants no more children but increases her risk of a pregnancy by not using contraception. Developing societies accordingly are more likely to have unwanted fertility when family planning is not

incorporated as quickly as drops in wanted fertility (Westoff 1981). Unmet need refers to the gap created by women not currently wanting children but who are not utilizing family planning. An important component of accurately estimating unmet need is to include pregnant women as having an unmet need if these women did not want their current pregnancies but were not using a contraceptive method at the time they became pregnant (Westoff 1981; Bongaarts 1991). Excluding these women could significantly underestimate unmet need since women having an unmet need are at a high risk of a pregnancy. Additionally, women not using a contraceptive method who want more children but not within two years are considered as having an unmet need since they have a need for spacing that is not being met (Westoff 1988; Bongaarts 1991).

Having an unmet need for a contraceptive method has been linked to poor family planning services, fear about side effects, disapproval from husbands or the community, and lack of information (Bongaarts & Bruce 1995; "Population Reports" 1996; Terbough et. al 1995). Particularly, knowing a modern method is important since traditional and folk methods are less effective in preventing pregnancy ("Population Reports" 1996).

Bongaarts and Bruce (1995) found that, of married Bolivian women with an unmet need, 52.8% did not use contraception because they lacked knowledge. This rate was more than double of any of the Latin American countries, which ranged from 5.6% in Ecuador to 17.4% in Peru. Family planning promotion can increase knowledge of modern contraceptives; however, increasing access to information about contraception has been difficult in Bolivia's multi-ethnic population (Mantilla & Antezana 2004). Low levels of education and not speaking Spanish create barriers for Indigenous women in accessing modern healthcare services (Terbough et. al 1995). Consequently, Bolivian

Indigenous women's access to family planning is often influenced by Indigenous men who are more educated and are more likely to be bilingual (Bolivia 1998; Terbough et. al 1995). The fear of adultery, however, can cause men to disapprove of family planning and prevent the women from gaining access (Bongaarts & Bruce 1995; Schuler et. al 1994; Terbough et. al 1995). Additionally, fears about side effects and modern medicine may dissuade Indigenous women from using modern contraceptives and can led them to turn to, or to continue to rely on less effective traditional methods (Schuler et. al 1994).

Men are not always aware of or share their partner's fertility preferences and attitudes towards contraception (Bankole & Singh 1998). Frequently, couples have discordant views, with men more often having higher fertility preferences (Bankole & Singh 1998; Carter & Speizer 2005; Casterline, Perez, Biddlecom 1997). Men may contribute to a women's unmet need by discouraging contraception use or by having higher fertility preferences (Bankole & Singh 1998; Becker 1999; Ezeh 1993; Casterline, Perez, Biddlecom 1997; Mason & Smith 2000). Unwanted fertility for women, therefore, could potentially be explained by men exerting their influence in the relationship and discouraging contraceptive use. Additionally, woman's perception of her partner's approval has strongly predicted contraception use, while her perception is not always accurate (Lasee and Becker 1997). Communication about family planning has been linked to couple agreement with family planning approval and has shown a positive association with contraception use (Bawah 2002; DeRose, Dodoo, Ezeh & Owuor 2004; Lasee and Becker 1997; Sharon and Valente 2002). Among Indigenous couples, communication about family planning can be hindered by the common practice of not discussing sexual matters openly, especially between the sexes (Bongaarts & Bruce 1995;

Schuler et. al 1994). Furthermore, understanding who has decision making power over contraceptive use creates a clearer understanding of reproductive behavior than looking at one partner alone (Allendorf 2007; Ezeh 1993; Wolff, Blanc & Ssekamatte-Ssebuliba 2000). If men have the final say in contraceptive use, then the woman's ability to address her unmet need and prevent unwanted fertility is limited. Including the influence of men when examining ethnic differentials in unwanted fertility in Bolivia is particularly important considering previous studies showing Indigenous men's aversion to contraception and frequent decision making power within the couple's relationship (Schuler et. al 1994; Terbough et. al 1995).

Methods

The data used for the study comes from the Bolivian 2003 standard Demographic and Health Surveys' (DHS) dataset. The nationally-representative household survey includes a respondent questionnaire for women between the ages of 15 through 49 and a male questionnaire given to the partners of the female respondents. The DHS concentrates on questions related to fertility, mortality, and health. The 2003 Bolivia standard DHS had 17,654 women respondents and a sub-sample of 2,873 couples where the women's partners were interviewed. Women who responded having the ethnicity "Quechua" (5,945), "Aymara" (3,016) or "Guarani" (364), were classified as Indigenous while women responding as having "None" (8,068) were classified as non-Indigenous. Women who responded "Other" (245) or missing (16) were excluded from the sample, reducing the female sample size used in this analysis to 17,393.

Couples were similarly classified as Indigenous if both the woman and the man responded as having either "Quechua", "Aymara" or "Guarani" as their ethnicity, while couples with both the woman and the man responding as "None" were classified as non-Indigenous. Couples where the partners fell into different ethnic categories (594) or at least one partner responding "Other" (115) or missing (2) were excluded from the sample. Since the couple analysis focuses on unmet need, only women with need for contraception were included; therefore, women who wanted children in less than two years, women who were infecund and pregnant women who wanted their current pregnancy then were dropped, which reduced the couple sample to 1,861, consisting of 1157 Indigenous couples and 704 non-Indigenous couples.

The primary purpose of this study is to compare the levels of wanted fertility, unmet contraceptive needs and contraceptive use between the Indigenous and non-Indigenous populations in Bolivia. The dependent variables used in this analysis related to future prospects for fertility are: (1) wanted total fertility rate, (2) unmet need, and (3) contraceptive use. The measure "Wanted Total Fertility Rate" (WTFR), developed by Bongaarts (1990), first calculates the "Want More Total Fertility Rate" (WMTFR) by identifying the TFR of women who still want more children (created from responses "have another" and "undecided" to the fertility preference item on the DHS), thereby excluding women who say they want no more children, have been sterilized, or declared infecund. Pregnant women were considered wanting more children if their ideal family size exceeded number of living children. Next, the WMTFR is incremented to include an additional wanted child since WMTFR only measures women still wanting another child. Additionally, a small error (c) is subtracted to account for the proportion of women in a

union who want more children but who are at the end of their reproductive years (women between the ages of 40-49) and for those women in a union who do not want any children. Therefore, WTFR= WMTFR + 1 – c.

Unmet contraceptive need was recoded into a dummy variable using 'unmet need to space' and 'unmet need to limit' as 1=yes, which was measured by DHS from multiple variables to define fecund females in a union who are not using a contraceptive method and do not want a birth within the next 2 years. Contraceptive use was measured by women's current use of a modern method and any method. The dummy variable "uses a modern method" (0=no; 1=yes) was created from the response to a question regarding contraceptive use where "no method," "folk method," or "traditional method" were coded as 0 and "modern method" was coded as 1. The dummy variable "uses any method" (0=no; 1=yes) included "modern method" along with "folk method" and "traditional method" coded as 1 and "no method" coded as 0.

Education and parity were included as socio-economic and background control variables, respectively. Education was measured separately for women and men by attainment in 3 categories: no education, primary and over primary, which combined secondary and higher education. Adjusted parity, the number of live births per woman plus current pregnancy, was categorized into 0 children, 1 child, 2 children, 3 children, 4 children, 5 children, and 6 or more children, truncating 6 to 13 children into one high parity category, with 13 being the highest reported number of children.

Attitudinal variables consisted of family planning approval and whether or not the men reported wanting another child. For women, family planning approval was defined as either "approves" or "disapproves\doesn't know", combining the two responses

disapprove and doesn't know. The couple family planning approval variables were formed by combining the individual women's and men's responses for approval. The variable "both approves" applies to couples where both partners in the couple responded "approves" in the respective individual questionnaire. The "man only" variable consists of men that responded "approves" while his female partner responded "disapproves" or "don't know." Conversely, the "woman only" variable consists of women who responded "approves" while her male partner responded "disapproves" or "don't know." The last family planning approval variable, "both disapprove/don't know", included couples where both partners responded either "disapprove" or "don't know". "Want another child" refers only to men because the sample is already limited to women who did not want another child. The dummy variable "want another child" was formed from "desire for more children." The responses "want within two years," "wants unsure timing," and "undecided" were combined to 1=yes, and "wants after 2+ years" and "wants no more" were combined to 0=no, while "declared infecund" and "missing" were excluded.

Perception variables used in the analysis consisted of the woman's perception of whether the couple discussed family planning, her partner's family planning approval, and couple fertility desire. All of the variables were taken from the women's questionnaire. The dummy variable "discussed family planning" came from a question asking women how often they have talked to their partner about family planning. The responses "once or twice" and "more often" were categorized as 1=yes, while the response "never" was categorized as 0=no. Another question asked if the woman thought her partner approved or disapproved of family planning. The variable of the women's perception of her partner's family planning approval has 3 categories: "approves,"

"disapproves," and "doesn't know." Since the question asked the woman to respond approves or disapproves, the "doesn't know" category refers to the woman not knowing her partner's perception (in contrast to her partner not knowing if he approves). A similarly framed question asked each woman her perception of her partner's fertility desire in relation to her own. The responses are divided into 4 categories: "both want same", "man wants more", "man wants fewer" and "don't know", for the case that the woman does not know her partner's desire in relation to her own.

Analyses were conducted using Stata statistical programming. Variables were examined by ethnic status comparing frequency, percentage, and chi-squares. Crosstabs were conducted by ethnicity for unmet contraceptive need and if pregnancy would be a problem to determine differences by ethnicity. Kappa statistics were run separately by ethnicity comparing women's and men's agreement on responses to "want another child" and woman's perception of her partner's family planning approval compared to his self reported approval of family planning. The multivariate examination of "using any contraceptive method" and "using modern contraception" as dependent variables, were run using logistic regression models. Five models were created to examine the relationships between ethnicity, other covariates, and the dependent variables. The first model includes ethnicity only. The second model adds the woman's socioeconomic and background variables (woman's education and woman's parity). The third model adds the woman's attitudinal variable (women's family planning approval) and knowledge of contraception. The fourth model adds the male and couple relevant variables (men's education, men's desire for another child, and couple family planning approval). Finally, the fifth model excludes the men and couple variables and adds the women's perception

variables of the men and (woman's perception of if couple discussed family planning, woman's perception of partner's family planning approval and woman's perception of couple's fertility desire).

Results

The 2003 DHS Bolivia Survey estimates a total fertility rate of 3.8 for all respondents. Figure 1 compares the total fertility rates and unwanted fertility estimates between Indigenous and Non-Indigenous women. Indigenous women have a 4.3 total fertility rate compared to 3.1 for Non-Indigenous. Surprisingly, however, both groups have almost identical wanted total fertility rates of 2.7 for Indigenous women and 2.6 for Non-Indigenous women. Unwanted fertility, calculated as the difference between wanted and total fertility rate, was therefore 1.6 for Indigenous women and .5 for non-Indigenous women. The estimated unwanted fertility is 1.1 higher in the Indigenous population (about one more additional child); in other words, the difference in TFR between ethnic populations can be attributed entirely to Indigenous women having higher unwanted fertility

Figure 2 depicts the percentages of Indigenous and non-Indigenous women in unions who want another child by the number of current children. In every adjusted parity category (the number of living children plus pregnancy), non-Indigenous women wanted another child proportionally more often than Indigenous. These results are interesting, since Indigenous women tend to have more children. Yet even among childless women, a higher percentage of non-Indigenous than Indigenous women want another child.

Unmet contraceptive need helps explain unwanted fertility since it measures the amount of fecund women in a union who do not want to become pregnant but are at risk of having unwanted fertility by not using contraception. Table 1 shows the differences between Indigenous and non-Indigenous women in unions by those who want another child and unmet need for contraception. Considering the unwanted fertility differentials, it was not surprising to find larger unmet contraceptive need for Indigenous women (26%) than for non-Indigenous women (19%).

Figure 3 compares the percentage of unmet contraceptive need for women in unions between Indigenous and non-Indigenous by the adjusted parity category. Despite the lower percentage of Indigenous women in unions not wanting another child, Figure 3 shows that unmet contraceptive need for women is higher among Indigenous at every adjusted parity category above zero. For instance, 33.4% of Indigenous women with 6 or more children have an unmet contraceptive need compared to 23.3% of non-Indigenous women; this results in an unmet need difference of 10.1%. Interestingly, the second highest ethnic differential of unmet need (9.6%) is found at parity 3, with 26.8% of Indigenous women and 17.2% of non-Indigenous women having unmet need. Recall that the wanted TFR is 2.7 for Indigenous women and 2.6 for non-Indigenous women. This suggests that at the point when most women reach their level of wanted fertility, Indigenous women are less likely than non-Indigenous women to use contraception despite not wanting another child.

Additionally, ambivalence towards an unwanted pregnancy has been associated with increased unmet need, with the logic that women not adamantly opposed to another pregnancy are less likely to use contraception even though they respond not wanting

another child (Speizer 2006). However, Table 2 shows that Indigenous women who do not want to have another child are more likely to think a pregnancy would be a big problem and almost half as likely to think a pregnancy would not be a problem than non-Indigenous women . The higher unmet need for Indigenous women cannot, therefore, be explained away by a more ambivalent attitude towards unwanted fertility since they show stronger negative views about having an unwanted pregnancy.

Indigenous women and men from the couple sample show lower educational attainment than non-Indigenous women and men, and Indigenous women have slightly higher adjusted parity (Table 3). For Indigenous women, 12.5% had no education, 66.4% had primary education, and 21.2% had above primary education, while non-Indigenous women had 2.8% with no education, 54.4% with primary education, and 42.8% with above primary education. Men had higher education in comparison to women, with Indigenous men having lower educational attainment than non-Indigenous men. For Indigenous men, 1.1% had no education, 61.7% had primary education, and 37.2% had above primary education, while non-Indigenous men had 1.4% with no education, 49.4% with primary education and 49.2% with above primary education.

Among Indigenous women in the couple sample who do not want another child in the next two years, adjusted parity is lowest for 0 children (as would be expected) at 1.0%, increases to 11.6% for 1 child, and jumps to 20.0% for two children and 19.8% for three children. Parity then decreases to 14.6% for 4 children, 12.1% for 5 children and peaks at 21.1% for 6 or more children. Non-Indigenous women display a similar pattern, but with higher percentages at the lower adjusted parities (0 to 4) than Indigenous women. Non-Indigenous women have 1.3% with 0 children, 16.2% for one child and

peak at 2 children with 22.6%. Parity starts decreasing at 3 children with 20.2%, 15.3% at 4 children, 9.1% at 5 children, and then increases to 15.3% at 6 or more children. The majority of women and couples in both ethnic groups approved of family planning; however, a lower percentage of Indigenous women and couples approved than non-Indigenous women and couples (Table 4). Approval was 11.4% lower for Indigenous women than non-Indigenous women, 83.6% compared to 95.0%. Couple approval of family planning was lower for Indigenous than non-Indigenous with only 64.0% of Indigenous couples both approving in contrast to 87.4% of non-Indigenous couples. Indigenous couples had more than twice the percentage of discordant agreement between couple approval with 9.7% of couples having only the male partner approval in contrast to 4.0% for non-Indigenous couples. Similarly, 19.6% of Indigenous couples have only the woman approval in contrast to 7.7% of woman only approval for non-Indigenous couples. Indigenous couples also had a higher percentage of both partners reporting either disapprove or don't know (6.7%) compared to 1.0% of non-Indigenous couples.

A small minority of men want another child; however, the percentage for Indigenous men, 4.9%, is half that of non-Indigenous men at 11.2% (Table 4). Table 5 shows women's perception of her partner's desire for children: 61.0% of Indigenous woman think that their partner wants the same number of children as she does, compared to 55.0% of non-Indigenous women. A lower percentage of Indigenous women think their partner wants more children than she does (17.1%) in relation to non-Indigenous (22.8%). While 11.2% of Indigenous women perceive their partner to want fewer children than they do, just 9.5% of non-Indigenous feel this way. Additionally, 10.7% of Indigenous women and 12.8% of non-Indigenous women do not know their partner's

desire for children in relation to their own. Women tend to perceive their partners approving of family planning regardless of ethnicity; however, more Indigenous women believe their partner disapproves or don't know his approval (Table 5). Of Indigenous women, 76.6% think their partner approves, 10.3% think he disapproves, and 13.1% don't know his approval. At the same time, 87.2% of non-Indigenous women think her partner approves, 6.3% think he disapproves, and 6.5% don't know his approval. Lastly, 82.2% of Indigenous women and 89.6% of non-Indigenous women responded that they have talked to their partner about family planning at least once (Table 5).

Kappa scores, which measure agreement, reveal that Indigenous couples agree more often on wanting another child than non-Indigenous couples (89.5% and 81.0% respectively). However, comparing a woman's perception of her partner's approval to his self-reported approval in cases where the female partner does not want another child produced a kappa statistic of 65.8% for Indigenous compared to 82.0% for non-Indigenous.

In sum, the Indigenous population tends to have some characteristics and attitudes that could lead to higher unwanted fertility. Indigenous people, for instance, have lower levels of educational attainment than non-Indigenous. Those with higher levels of educational attainment are more likely to learn about different contraceptive methods, how to use them, and where to obtain them. Furthermore, education can increase acceptance of modern science and make using modern methods less of a taboo. Parity can affect unwanted fertility and contraceptive need in two ways. First, women at higher parities are more likely to want to stop childbearing since they have reached or surpassed their wanted births. Second, high fertility could be a result of continued non-use of

contraceptives even after previous unwanted births. Since Indigenous women show higher percentages at higher parities from child 4 and onwards than non-Indigenous women, this could explain part of unwanted fertility and unmet need. Attitudinal variables can also affect contraceptive use. If a person does not approve of family planning, getting that person to use family planning becomes a much harder reality regardless on his or her fertility desires. Similarly, the contraceptive use outcome could be affected if only one partner approves of family planning. The majority of Indigenous women approve of family planning; however non-Indigenous women still have a higher percentage of approval. When looking at couples, family planning approval is much lower for Indigenous. Additionally, more Indigenous couples have only one partner approving, which could lead to non-use. On the other hand, Indigenous men not only want another child less often than non-Indigenous men, the kappa agreement statistics show that Indigenous couples have higher agreement on fertility desires. This finding is reflected in women's perception of fertility desires. Compared to non-Indigenous women, more Indigenous women perceive that their partner wants the same amount or even fewer children than themselves.

However, Indigenous women perceive their partners to approve of family planning less often than do non-Indigenous women. Indigenous women also have a lower kappa agreement statistic on predicting partner's approval, which might reflect a lower level of communication about family planning. Finally, Indigenous women are less likely to discuss family planning with their partners, which could dissuade use if they feel partner approval is needed for use. By not communicating, they lose the opportunity to

convince their partner to agree with their approval and they are less likely to have a clear perception of what their partner thinks.

Given the evidence that Indigenous women in Bolivia have a higher rate of unwanted fertility and unmet need, are less likely to desire another child, and have stronger negative views about unwanted pregnancy, the next logical step is to see if the attitudes of men play a part in unwanted fertility. So far, none of the measures used have taken into account couple dynamics and men's potential influence on his partner's reproductive behavior. Unwanted fertility and unmet need are calculated from woman's fertility desires in relation to her reproductive outcomes and behavior. Male partners, however, do not always have the identical fertility desires as their female companions. A woman might have an unwanted birth if it was only wanted by her partner and he influenced her reproductive behavior; this could explain ethnic differentials if Indigenous men have discordant views about fertility desires or the ability to discourage contraception use more than non-Indigenous men. In order to test this possible influence, I compared the likelihood of using any contraception and using only modern contraception by looking at ethnic differentials controlling for background and socio-economic characteristics, women only characteristics and attitudes, couple characteristics and attitudes, and women's characteristics and attitudes with her perception of partner's attitudes. Method use was separated into any contraceptive use and modern contraceptive use because the distribution of use by method type showed a lower percentage of Indigenous women using more effective modern methods. Seen in Table 6, the percentage of women using any form of contraception was 56.3% of the Indigenous sample compared to 74.0% of the non-Indigenous sample with an ethnic differential of

17.7%. After narrowing use to only modern methods, the differentials between ethnicities increased to 33.9% with 27.3% of Indigenous women using a modern form of contraception compared to 61.2% of non-Indigenous women. Separate analyses were performed since unwanted fertility can result from using less effective methods as well as not using any method.

Table 7 shows the results of logistic regression models assessing the likelihood of Bolivian women using any contraception. Model 1 shows the odds of Indigenous women are less than half those for non-Indigenous women without including controls. After adding education and parity in Model 2, Indigenous women are 46% less likely to use any contraceptive method in comparison to non-Indigenous women, reducing the difference between ethnic groups by 11%. When women's approval of family planning is included in Model 3, the difference falls to 41%, showing that women's attitudes account for some of the ethnic differentials in contraceptive use. In Model 4, the men and couple variables are introduced; their inclusion results in the likelihood of Indigenous women using any contraceptive 36% less than non-Indigenous women, a net decline of 5%. In the final model, there is a 6% net decline in ethnic differentials. Indigenous women exhibit 30% lower odds of using any form of contraception compared to non-Indigenous women. Of the models with controls, Model 5 explains the ethnic differentials the most with a 24% reduction between Indigenous and non-Indigenous use compared to the initial model.

Among women not wanting another child, non-Indigenous women are twice as likely to use a modern method as Indigenous women (Figure 4). In order to further explore this differential, Table 8 shows the likelihood of Indigenous women using

modern contraception compared to non-Indigenous women. In Model 1, the odds ratio shows Indigenous women are 81% less likely to use modern contraception without any controls. In Model 2, women's education and parity are included as socioeconomic and background controls, which only modestly influences the ethnic differentials. In Model 3, women's approval of family planning is added, which has no effect on the ethnicity variable; in other words, any difference in women's attitudes towards family planning does not account for the ethnic differential in likelihood of using a modern contraception. In Model 4, both partners' characteristics and attitudes are included for a couple analysis, revealing that men's attitudes and characteristics explain a very small part of ethnic differentials. Net of 2%, Indigenous women still exhibit 75% lower odds of using modern contraception compared with non-Indigenous women. Further, the male-specific variables (his education and his desire for another child), are insignificant, suggesting men do not have a strong influence on women's modern contraceptive use in Bolivia. In the last model, the male partner's characteristics and attitudes are replaced with the woman's perception of her partner's attitudes. The likelihood for using a modern contraception between Indigenous and non-Indigenous women again decreases only slightly with Indigenous women still showing 73% lower odds of using modern contraception compared to non-Indigenous women. Therefore, the gap between Indigenous women and non-Indigenous women's likelihood of using modern contraception is best explained by the model that includes women's socio-economic and background characteristics, her attitudes on family planning approval and her perception of partner's attitudes towards family planning approval as well as his fertility desire but

only to a small degree, with controlling independent variables accounting for 8% of the ethnic differential.

Discussion

This study examines the factors underlying ethnic differentials in the TFR between Indigenous and non-Indigenous Bolivian women. In order to explain the differences, this study measures the: (1) wanted total fertility rate, (2) unmet contraceptive need, and (3) men's influence on women using any contraceptive method and only modern contraceptive methods, using the 2003 Bolivian Demographic and Health Survey. Surprisingly I found an identical "Wanted Total Fertility Rate" (WTFR) for both the Indigenous and non-Indigenous populations; however, the "Unwanted Fertility Rate" (UTFR)" for Indigenous women was fully three times the level of non-Indigenous women. In other words, unwanted fertility accounts for all of the ethnic differentials in the TFR among Bolivian women. Unwanted fertility occurs when the respondent does not want another child but continues to have children. As previously discussed, looking directly at unwanted fertility causes bias because women tend to under-report children already born as unwanted. A better indicator for predicting unwanted fertility is to look at unmet contraceptive need. If a fecund woman in a union does not want a child within the next two years but does not use a form of contraception, she puts herself at a high risk for an unwanted pregnancy. Bolivian Indigenous women have a higher unmet contraceptive need than non-Indigenous women, compounded by the lower percentage of contraceptive use despite having more women not wanting another child. While unmet contraceptive need explains a part of unwanted fertility, there is still the question of what causes the ethnic differentials in unmet need.

Wanted, unwanted, and unmet need are all measures based on women's responses and reflect their desires and behavior; however, men may not always agree with their partners on wantedness and can affect unmet need by discouraging contraceptive use. Including men in looking at ethnic differentials in unwanted fertility is especially important considering that studies have shown Indigenous men in Latin America to be a barrier to using contraception (Schuler et. al 1994; Terbough et. al 1995). However, Indigenous couples have a higher kappa agreement statistic for if they want another child than non-Indigenous couples. This suggests that the higher levels of unwanted fertility and unmet needs are not due to couple disagreement over fertility preferences. Moreover, a smaller percentage of Indigenous men want another child in contrast to non-Indigenous men; yet, Indigenous men also have a lower percentage of family planning approval.

How these conflicting attitudes affect women's unmet need was tested by comparing the odds of Indigenous women in reference to non-Indigenous women use of any contraception and modern contraception, controlling for socioeconomic and background variables as well as attitudinal and perception variables. The control variables used in this analysis include women and men's education, parity, women and couple's approval of family planning, men's fertility desire and women's perception of partner's family planning approval, his fertility desire in relation to her own and discussion of family planning. The results show that approval of family planning has a more significant predictor of using contraception than fertility desire. Additionally, women's perception of partner's attitudes explains ethnic differentials more than her attitude alone or her partner's actual attitude. Notably, Indigenous women thought their partners approved less than did non-Indigenous women; however, their accuracy at

predicting their partner's actual approval was lower. Women's perception of their partner's family planning approval significantly predicts the likelihood of women using contraception, yet 33% of Indigenous women incorrectly predict their partner's attitude. However, neither women and men's characteristics or attitudes nor women's perception of men's attitudes extensively explain ethnic differentials in the likelihood of women using any contraception and especially modern contraception.

Interestingly, the ethnic differentials with the odds of using a modern contraception were much larger than use of any method and additionally were less affected by the control variables, which suggest a significant unknown predictor for modern method use. Furthermore, the perception of family planning approval is significantly stronger than the women's own family approval for the likelihood of using any contraception while the opposite is true for using a modern method. Since the difference between any method and modern method is the inclusion of traditional methods, it suggests that women who use modern methods are more driven by their own attitude towards family planning while women who use traditional methods are more likely to be influenced by what they perceive their partner to think.

The results of this study suggest significant differentials in wanted and unwanted fertility by Indigenous ethnicity. Indigenous women in the sample showed risk for higher unwanted fertility rate with less desire for more children, higher unmet contraceptive need, and were less likely to use any contraception, especially modern methods, even after controlling for known characteristics associated with unwanted fertility and accounting for men's influence on reproductive behavior. Research has largely avoided looking at wanted fertility by ethnicity. Examining the connection between Indigenous

ethnicity and unwanted fertility is, however particularly important for Bolivia considering the large Indigenous population. Indigenous fertility trends have the potential of significantly impacting the country based solely on the size of the population. For a mid-transitional developing nation, the substantial amount of unwanted fertility in the Indigenous population could significantly delay the country from reaching replacement fertility levels. Additionally, unwanted fertility could exacerbate poverty conditions found prevalently throughout Bolivia. Addressing the ethnicity differentials in unwanted fertility allows family planning programs and policies aimed at reducing unwanted fertility to become more effective in focusing on the particular needs of the Indigenous group.

Appendices

Table 1. Descriptive characteristics for women in a union of want another child and unmet need for contraception in Bolivia by ethnicity

	Women				
	Indigenous (n=5,816)		Non-Indigenous (n=4,633)		
Variables	N	%	n	%	χ^2
Want another child-women^	1414	24.31	1572	33.93	116.88***
Unmet need for contraception	1497	25.73	873	18.84	69.87***

Note: Using 2003 DHS Bolivia individual data set ^ want another child includes children wanted now, after 2 years, and wants unsure timing, undecided & pregnant women wanting current pregnancy then

Table 2: Percentage of Bolivian women in a union and not wanting another child who believe becoming pregnant would be a big, small or no problem by ethnicity

	Indigenous	Non-Indigenous
Big Problem	72.39	49.16
Small Problem	10.33	17.94
No Problem	17.28	32.90

Note: **DHS Bolivia, 2003 couple data**

Table 3. Descriptive characteristics of Bolivian women and men for socio-economic and background variables

	Socio-economic and Background variables				
	Indigenous (n=1157)		Non-Indigenous (n=704)		
Variable	n	%	n	%	χ^2
Education-women					125.44***
None	144	12.45	20	2.84	
Primary	768	66.38	383	54.40	
Above Primary	245	21.18	301	42.76	
Education-men					25.94***
None	13	1.12	10	1.42	
Primary	714	61.71	348	49.43	
Above primary	430	37.17	346	49.15	
Parity^					20.12**
0	11	0.95	9	1.28	
1	134	11.58	114	16.19	
2	231	19.97	159	22.59	
3	229	19.79	142	20.17	
4	169	14.61	108	15.34	
5	139	12.01	64	9.09	
6 or more	244	21.09	108	15.34	

Note: DHS Bolivia 2003 couple dataset ^Includes living children plus current pregnancy

Table 4. Descriptive characteristics of attitudinal variables in Bolivia by ethnicity

	Attitudinal variables				
	Indigenous (n=1157)		Non-Indigenous (n=704)		
Variable	n	%	n	%	χ^2
Approval of family planning- women					53.99***
Approve	967	83.58	669	95.03	
Disapprove/Don't know	190	16.42	35	4.97	
Approval of Family Planning- couple					
Approve	740	63.96	615	87.36	124.88***
Man only	112	9.68	28	3.98	
Woman only	227	19.62	54	7.67	
Disapprove/Don't know	78	6.74	7	0.99	
Wants another child-men	56	4.85	79	11.22	26.38**

Note: DHS Bolivia 2003 couple

Table 5. Descriptive characteristics of perception variables in Bolivia by ethnicity

	Perception variables				
	Indigenous (n=1188)		Non-Indigenous (n=720)		
Variable	n	%	n	%	χ^2
Woman's perception of partner's desire for children					11.68**
Both want same	679	61.01	331	54.98	
Man wants more	190	17.07	137	22.76	
Man wants fewer	125	11.23	57	9.47	
Don't know	119	10.69	77	12.79	
Woman's perception of partner's approval of Family Planning					31.92***
Approves	882	76.63	614	87.22	
Disapproves	118	10.25	44	6.25	
Don't know	151	13.12	46	6.53	
Discuss Family Planning					19.01***
Yes	949	82.16	630	89.62	
No	206	17.84	73	10.38	

Note: DHS Bolivia 2003 couple dataset

Table 6. Descriptive Characteristics of outcome variables in Bolivia by ethnicity

	Outcome variables				
	Indigenous (n=1157)		Non-Indigenous (n=704)		
Variable	n	%	n	%	χ^2
Modern contraception use	316	27.31	431	61.22	209.46***
Any contraception use	651	56.27	521	74.01	59.07***

Note: DHS Bolivia 2003 couple dataset

Table 7: Odds ratios from logistic regressions by selected characteristics, attitudes and perceptions examining the likelihood of women using any contraception

Independent Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Ethnicity					
Non-Indigenous	1.00	1.00	1.00	1.00	1.00
Indigenous	0.43***	0.54***	0.59***	0.64***	0.70*
Socio-economic and Background					
Education- women					
No education		1.00	1.00	1.00	1.00
Primary		3.03***	2.46***	2.30***	2.83***
Above primary		4.76***	3.45***	2.50**	3.08***
Education- men					
No education				1.00	
Primary				1.49	
Above primary				2.17	
Parity (women)					
0		1.00	1.00	1.00	1.00
1		0.76	0.62	0.63	0.77
2		1.14	0.94	0.94	0.91
3		1.04	0.86	0.89	0.88
4		1.14	0.94	1.00	0.95
5		0.84	0.71	0.80	0.93
6 or more		0.66	0.56	0.61	0.71
Attitudinal					
Family planning approval (women)					
Approves			1.00		1.00
Disapproves\Doesn't know			0.17***		0.50*
Couple family planning approval					
Both approve				1.00	
Man only				0.20***	
Woman only				0.57**	
Both disapprove\ Don't know				0.07***	

Want another child (men)			
No		1.00	
Yes		1.03	
Perception			
Woman's perception of if couple discussed family planning			
Never discussed			1.00
Discussed			1.74*
Woman's perception of partner's family planning approval			
Approves			1.00
Disapproves\Doesn't know			0.13***
Woman's perception couple fertility desire			
Both want same			1.00
Man wants more			1.17
Man wants fewer			0.95
Don't know			0.65*

Note: Using DHS couple dataset ***p<.05** ****p<.01** *****p<.001**

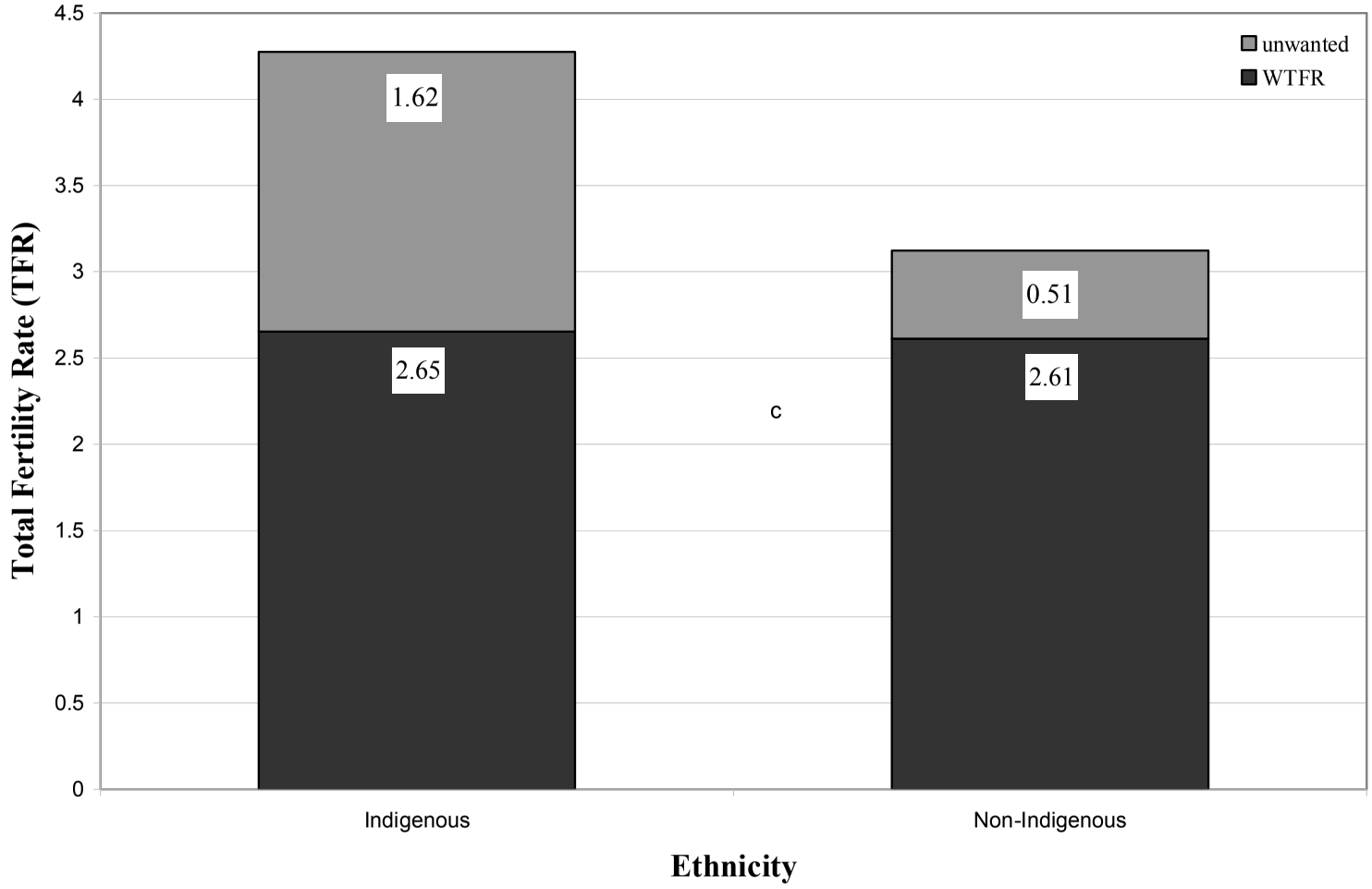
Table 8: Odds ratios from logistic regressions by selected characteristics, attitudes and perceptions examining the likelihood of women using modern contraception

Independent Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Ethnicity					
Non-Indigenous	1.00	1.00	1.00	1.00	1.00
Indigenous	0.19***	0.23***	0.23***	0.25***	0.27***
Socio-economic Background					
Education- women					
No education		1.00	1.00	1.00	1.00
Primary		1.77*	1.43	1.47	1.56
Above primary		2.97***	2.23*	2.22*	2.04
Education- men					
No education				1.00	
Primary				1.27	
Above primary				1.19	
Parity (women)					
0		1.00	1.00	1.00	1.00
1		1.29	1.21	1.17	1.17
2		1.72	1.63	1.57	1.32
3		1.96	1.87	1.82	1.42
4		1.63	1.54	1.45	1.09
5		1.74	1.72	1.77	1.34
6 or more		1.14	1.15	1.16	0.89
Attitudinal					
Family planning approval (women)					
Approves			1.00		1.00
Disapproves\Doesn't know			0.16***		0.17***
Couple family planning approval					
Both approve				1.00	
Man only				0.17***	
Woman only				0.46***	
Both disapprove\ Don't know				0.03**	

Want another child (men)		
No	1.00	
Yes	1.01	
Perception		
Woman's perception of if couple discussed family planning		
Never discussed		1.00
Discussed		1.29
Woman's perception of partner's family planning approval		
Approves		1.00
Disapproves\Doesn't know		0.42**
Woman's perception couple fertility desire		
Both want same		1.00
Man wants more		1.44
Man wants fewer		1.02
Don't know		0.61

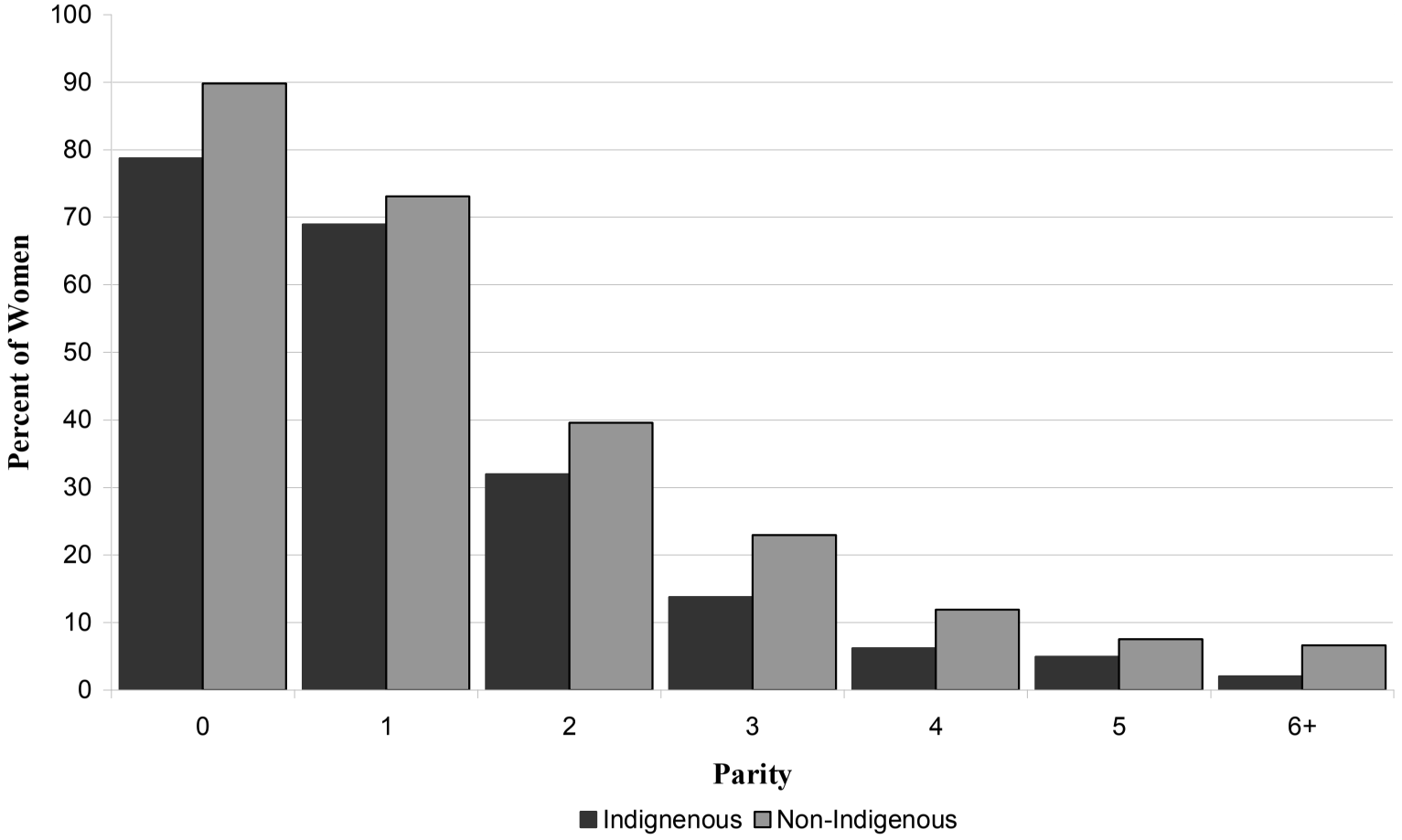
Note: Using DHS couple dataset ***p<.05** ****p<.01** *****p<.001**

Figure 1. Wanted total fertility rate (WTFR) and unwanted estimates by ethnicity



Note: DHS 2003 Individual dataset

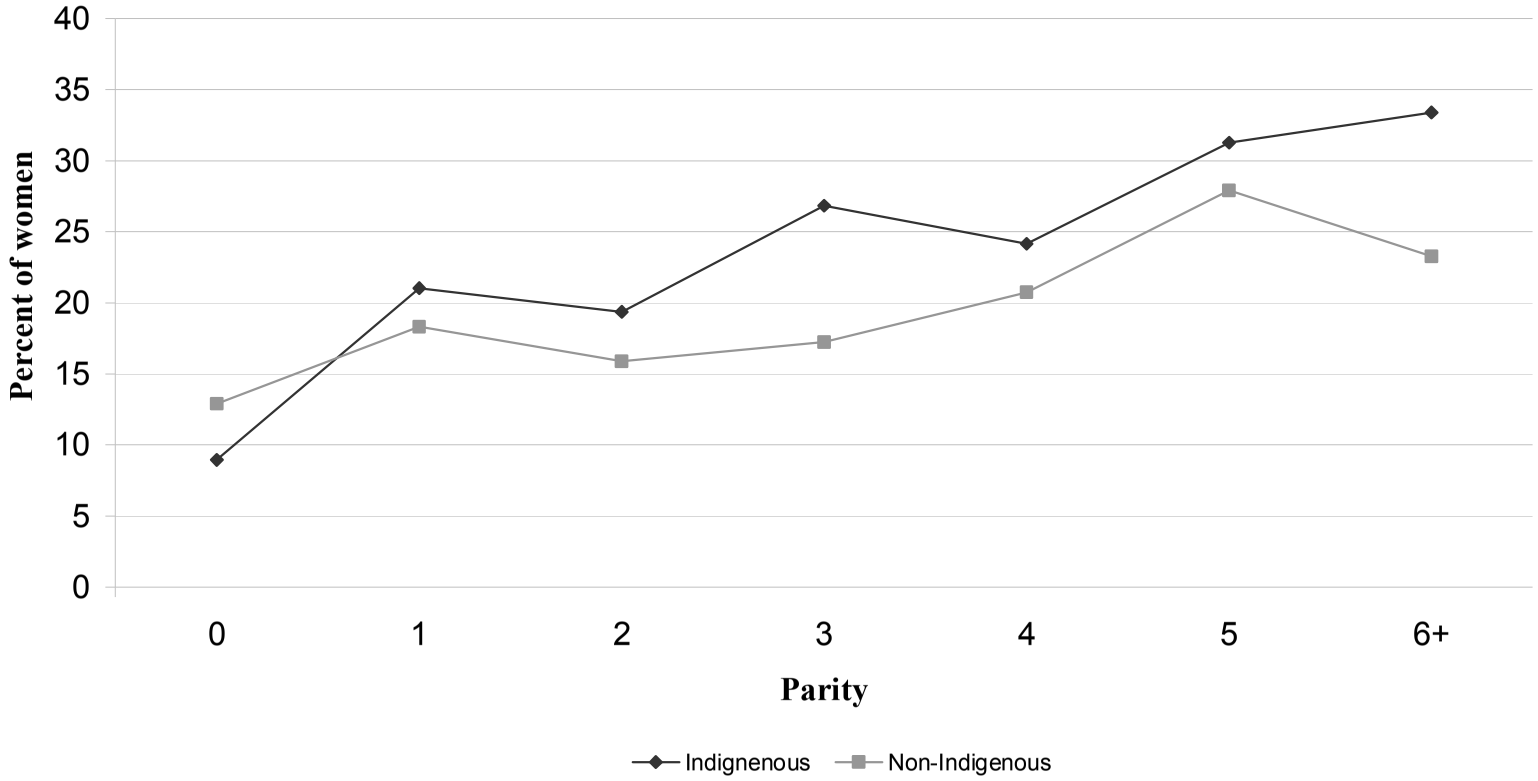
Figure 2. Percentage of wants another child for women in a union by parity and ethnicity



Not

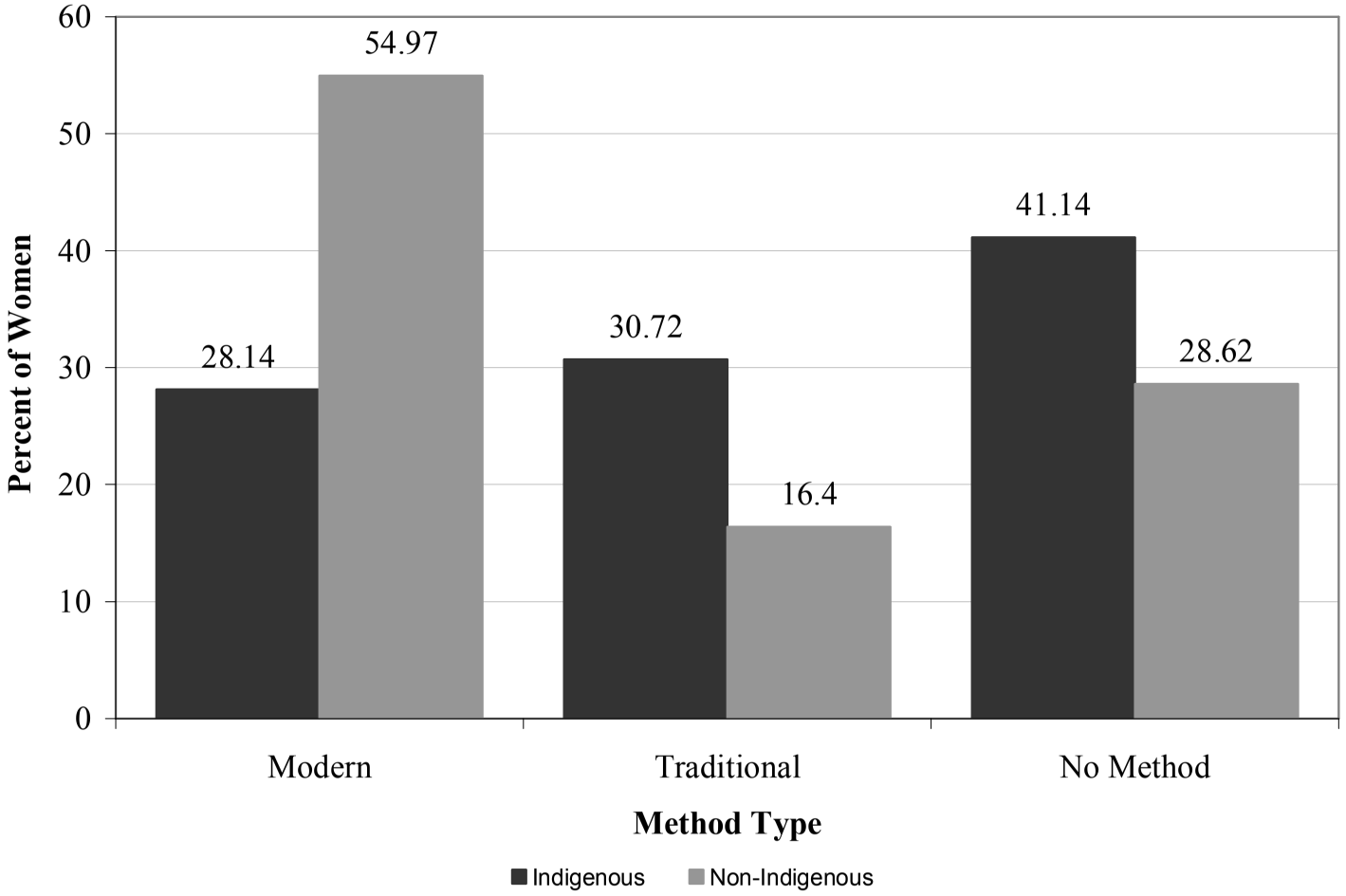
e: DHS Bolivia, 2003 individual dataset

Figure 3. Percentage of unmet contraception need for women in a union by parity and ethnicity



Note: Unmet need for women in a union from DHS Bolivia, 2003 individual datase

Figure 4. Percent of current contraceptive use for women not currently wanting a child by method type and ethnicity



Note: DHS Bolivia couple dataset

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