Ethnic Inequality in Guatemalan Women's Use of Modern Reproductive Health Care

CONTEXT: *Guatemala has some of the poorest reproductive health indices and largest disparities in health in Latin America, particularly between indigenous and ladina women. To reduce these disparities, it is necessary to understand how indigenous women's disadvantages in linguistic, socioeconomic or residential characteristics relate to their underutilization of reproductive health services.*

METHODS: *Logistic regression analyses of a nationally representative sample of women aged 15–49 from the 2008–2009 National Survey of Maternal and Infant Health were used to estimate ethnic disparities in women's use of institutional prenatal care and delivery, and in met demand for modern contraceptives. Using predicted probabilities, we estimated the extent to which these disparities were attributable to a language barrier among indigenous women and to their disadvantage in selected socioeconomic and residential characteristics.*

RESULTS: *The ethnic difference in use of institutional prenatal care was small; however, institutional delivery was far less common among indigenous women than among ladina women (36% vs. 73%), as was met need for modern contraceptives (49% vs. 72%). Not speaking Spanish accounted for the largest portion of these ethnic differentials. Indigenous women's poor education and rural residence made up smaller portions of the ethnic differential in modern contraceptive use than did their economic disadvantage.*

CONCLUSION: *The large proportion of indigenous women who use institutional prenatal care suggests that further integrating the three services may increase their use of institutional delivery and modern contraceptives. Adding speakers of local Mayan languages to the staff of health facilities could also help increase use.*

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Guatemala lags behind most Latin American countries that have undergone demographic and epidemiological transitions in fertility and maternal and child mortality.[1] Guatemala also has one of the highest levels of health inequality in Latin America:[2] Studies have consistently shown that indigenous women use reproductive health care services less frequently than "ladinas," Spanish-speaking women of mixed Spanish and indigenous heritage.[3–6]

Although some suggest that indigenous women's socioeconomic and residential disadvantages are the most important factors in their underutilization of modern health care services,[3] others maintain that neither of these factors fully explains the ethnic disparity in women's use of pregnancy-related services[4] or contraceptives.[5,6] According to qualitative research, indigenous people in Guatemala face discrimination at health care facilities that are staffed by predominantly ladino personnel; they distrust and avoid modern health care services; and they prefer traditional alternatives to institutional prenatal care and delivery.[7]

In this study, we used nationally representative data from Guatemala's most recent reproductive health survey, conducted in 2008–2009, to estimate the magnitude of ethnic inequality in the use of institutional prenatal care and delivery services, and in met demand for modern contraceptives among Guatemalan women. We also estimated

the extent to which this inequality was attributable to: a language barrier; differences in education level, in household wealth or in residential characteristics; and unknown factors (residuals).

Reproductive Health Indicators and Disparities
A cross-national comparison of health indicators among Central America's four countries highlighted the poor reproductive, maternal and child health indicators in Guatemala.[1] Although the country's total fertility rate (TFR)—the number of lifetime births a woman would be expected to have at current age-specific rates—declined from 5.6 in 1987 to 4.4 in 2002, the TFR and wealth-related disparities in total fertility continued to be among the largest in Latin America. Similarly, Guatemala's annual mortality rate among infants (30 per 1,000 live births) and among children younger than five (42 per 1,000 live births), as well as the wealth-related differentials in these rates, continued to be the highest in Central America. Differences in health indicators by wealth overlap with differences by ethnicity, because indigenous people are overrepresented in the lowest socioeconomic stratum in Guatemala. Ethnic differences in these indices were large in the 2008–2009 survey: The TFR was 4.5 among indigenous women and 3.1 among ladina women, and the mortality rate among

TABLE 1. Percentage distribution of pregnancies and deliveries, by selected characteristics of mother, according to ethnicity, National Survey of Maternal and Infant Health, Guatemala, 2008–2009

Characteristic	Indigenous (N=6,390)	Ladina (N=4,577)
Spanish language fluency		
Yes	47.0	na
No	53.0	na
Yrs. of school*		
0	40.5	14.5
1–5	38.0	32.9
6	11.2	17.1
7–11	7.0	20.4
≥12	3.2	15.2
Household wealth (quintile)*		
Lowest	41.7	13.9
Second	26.6	19.1
Third	18.0	21.4
Fourth	9.9	27.7
Highest	3.8	18.0
Area of residence*		
Rural	69.7	46.6
Urban	21.4	27.0
Capital	9.0	26.3
Households with electricity (tertile)*		
Lowest	55.8	31.2
Middle	30.2	42.2
Highest	14.0	26.6
Total	100.0	100.0

***p<.001. *Notes:* N=pregnancies and deliveries that ended in live births within 60 months prior to the survey. Pearson's chi-square test was used to identify associations between pregnancies and deliveries among indigenous and ladina mothers and selected characteristics.

children younger than five was 51 per 1,000 live births for indigenous women and 33 per 1,000 for ladina women.[8]

One important factor in the poor health status of Guatemala's mothers and children, particularly in the indigenous population, has been the low level of public spending on health care.[2] In 2008, the Guatemalan government's estimated per capita expenditure on health care was the equivalent of US$97; the total expenditure on health constituted only 28% of all government expenditures. Both figures were lower than those in any other Latin American or Caribbean country for which data were available (except for those in Haiti).[9] The government's low prioritization of maternal health care during the past several decades has had a particularly adverse affect on indigenous women, who are disproportionately poor and live primarily in rural areas. Whereas the women in Guatemala's middle and upper classes, most of whom are ladina, are able to receive reproductive services at expensive private clinics and hospitals (which are generally located in cities), indigenous women tend to use government-run health facilities whose services are free or heavily subsidized if they use modern health care services at all.

In addition, indigenous people, who generally speak a local Mayan language as their mother tongue, may face language barriers at health care facilities, which are often staffed solely by ladino health practitioners who speak only Spanish, even when serving indigenous communities.[10-12] Educational disadvantage among indigenous women[13] may also contribute to their lower level of health care utilization, because educational attainment is associated with patients' knowledge of biomedical approaches to reproduction and with their ability to communicate about their health concerns with medical personnel.[14]

DATA AND METHODS

In this study, we analyzed data from the 2008–2009 National Survey of Maternal and Infant Health (Encuesta Nacional de Salud Materno Infantil—ENSMI).[8] The 2008–2009 ENSMI collected data from a nationally representative sample of 16,819 women aged 15–49. The survey used a stratified, multistage cluster sample design derived from the census tracts created for the 2002 census. The final sample consisted of 733 census tracts. The cluster design permitted the construction of community-level variables for the present study. Thirty households were randomly selected from each census tract, and one woman of reproductive age was randomly selected from each household. The household response rate was 94%, and the individual response rate was 95%.[8] Throughout the analysis, we used sampling weights to adjust for unequal probabilities of selection of households and women.

Variables

•*Dependent variables.* The dependent variables were recent use of institutional prenatal care and delivery, and current use of a modern contraceptive method. For both institutional prenatal care and delivery, the unit of analysis was pregnancy or delivery, and the analytic sample consisted of those that had resulted in live births during the five years prior to the interview. We defined use of institutional prenatal care as having visited a health care facility—including public, private and nongovernmental hospitals, clinics, and health centers and posts—at least once during a pregnancy ending in a live birth. We defined use of institutional delivery services as having given birth in one of these health care facilities.

For modern contraceptive use, the unit of analysis was a woman. To capture met demand for contraceptives, the analytic sample was restricted to nonpregnant but fecund women who reported having had sexual intercourse in the previous 30 days and not wanting to have a child in the next 11 months, regardless of marital status. We defined current modern contraceptive use as having used one of the following methods in the 30 days before the interview: the pill, injectable, implant, condom, spermicide, IUD, and male or female sterilization.

•*Independent variables.* Our primary independent variable was ethnicity (indigenous or ladina), which we determined by women's responses to the question, "Do you consider yourself indigenous, ladina, or of other ethnicity?" and their self-reported native language. We classified women who identified themselves as indigenous or reported a

Mayan language as their native tongue, regardless of self-identified ethnicity, as indigenous. We categorized women who identified themselves as ladina and whose native tongue was not a Mayan language as ladina. We excluded from our analysis women who did not identify their ethnicity or who identified an ethnicity other than indigenous or ladina, unless they reported a Mayan language as their native tongue.

We selected four characteristics as determinants of modern health care utilization. The first was Spanish language fluency: We determined whether indigenous women spoke Spanish fluently, according to the language that they reported as their native tongue or spoke habitually at home. If one of these languages was reported to be Spanish, then we classified them as Spanish speakers. The second was years of school, which we categorized as: no school (0 years), incomplete primary (1–5 years), complete primary (6 years), incomplete secondary (7–11 years), and complete secondary and higher (12 or more years). The third characteristic, household wealth, was divided into quintiles of a weighted score that reflected possession of selected household goods (such as cars and washing machines) and housing materials (roof, walls and floors) to portray long-term accumulation of wealth. Weights were derived from a principal components analysis.[15]

Finally, to capture geographic obstacles to health care utilization, we used two community-level variables: area of residence and degree of urbanization. Area of residence had three categories, including the county of Guatemala, which contains the national capital city, other urban area and rural area. Degree of urbanization was constructed as tertiles, according to the percentage of women's households that had electricity.

Analytic Strategy

We conducted our analysis in three steps. First, we assessed the distribution of the characteristics described above among ladina and indigenous women to explore the proportion of indigenous women with a linguistic, socioeconomic or residential disadvantage. Then, we evaluated bivariate associations between each of these characteristics and each of the three reproductive health services separately for indigenous and ladina women.

In the second step, we constructed six logistic regression models. The first five models are designed to assess the degree to which ethnic differences in women's use of the three reproductive health services could be accounted for by ethnic differences in the distribution of each characteristic. The base model (model 1) consisted of the dichotomous indicator of ethnicity and control variables. In models 2–5, we added the four selected characteristics to the base model one at a time. Thus, we added Spanish language fluency to model 2; years of school to model 3; household wealth to model 4; and the two residential variables to model 5. The final model (model 6) included all the variables to assess the residual effect of being indigenous on women's likelihood of using each of the three

health care services, and the relative importance of each characteristic as a determinant of service use. In addition, we tested the significance of interactions between ethnicity and each of the characteristics to determine whether it differentially affected health care utilization by ethnicity; however, because we found few of the interactions to be significant, we did not include them in our final models.

In the third and final step, we used the coefficient estimates obtained in model 6 to calculate predicted probabilities of service use and decomposed the ethnic differentials into the four characteristics and the residual that these characteristics cannot explain. We calculated the predicted probability that indigenous women would use each service by applying the weighted means for each of the characteristics among the indigenous women in our sample. Here, other control variables were set to their respective weighted means for the entire sample. Each value was sequentially replaced by the weighted mean for each of the variables of the ladina sample to calculate the predicted probability that indigenous women would have used the service if they had possessed the characteristic that was typical of ladina women. The residual represents the coefficient estimate of being indigenous in model 6; it consists of unknown characteristics associated with be-

TABLE 2. Percentage distribution of sexually active women, by selected characteristics, according to ethnicity, National Survey of Maternal and Infant Health, Guatemala, 2008–2009

Characteristic	Indigenous (N=3,633)	Ladina (N=3,896)
Spanish language fluency		
Yes	54.1	na
No	45.9	na
Yrs. of school*		
0	37.4	12.0
1–5	37.3	30.1
6	12.3	17.3
7–11	8.4	19.9
≥12	4.6	20.7
Household wealth (quintile)*		
Lowest	32.0	7.9
Second	25.8	10.1
Third	20.4	19.9
Fourth	14.7	27.4
Highest	7.1	30.8
Area of residence*		
Rural	63.8	38.2
Urban	25.2	28.6
Capital	11.1	33.2
Households with electricity (tertile)*		
Lowest	49.6	25.8
Middle	33.2	46.4
Highest	17.3	27.8
Total	100.0	100.0

***p<.001. *Notes:* N=nonpregnant but fecund women who had had sexual intercourse within 30 days prior to the survey and who did not want to have a child within 11 months. Pearson's chi-square test was used to identify differences in the distribution of indigenous and ladina women by selected characteristics.

TABLE 3. Percentage of pregnancies that received institutional prenatal care, percentage of births delivered in an institution and percentage of women with a met demand for modern contraceptives, according to selected characteristics, by ethnicity, National Survey of Maternal and Infant Health, Guatemala, 2008–2009

Characteristic	Institutional prenatal care		Institutional delivery		Met demand for modern contraceptives	
	Indigenous	Ladina	Indigenous	Ladina	Indigenous	Ladina
All	**74.0**	**86.0**	**36.0**	**73.0**	**48.9**	**72.2**
Spanish language fluency						
Yes	80.1	na	55.1	na	59.6	na
No	68.5	na	19.0	na	36.4	na
Yrs. of school						
0	65.8	69.7	21.0	42.6	40.4	58.1
1–5	74.9	79.4	35.4	61.1	48.0	70.3
6	82.9	89.8	52.2	78.2	60.6	72.5
7–11	90.8	95.2	76.4	91.9	68.3	79.3
≥12	97.5	99.1	88.7	97.8	59.1	75.9
Household wealth (quintile)						
Lowest	67.0	70.5	17.0	33.2	36.0	52.1
Second	73.7	79.6	32.6	55.3	42.4	66.6
Third	77.9	82.8	50.5	73.8	56.4	66.5
Fourth	89.2	92.3	78.6	89.6	66.6	80.4
Highest	93.2	98.7	88.6	96.3	73.4	76.3
Area of residence						
Rural	70.2	79.1	24.6	56.0	42.0	67.0
Urban	80.1	91.9	53.4	85.3	56.9	75.9
Capital	88.5	92.1	82.6	90.6	70.6	74.9
Households with electricity (tertile)						
Lowest	68.4	78.9	22.5	53.0	42.1	66.5
Middle	80.4	89.2	48.8	81.1	53.1	74.8
Highest	82.1	89.1	62.5	83.5	60.6	73.0

Note: According to Pearson's chi-square test, percentages of women within each ethnic group using each service differ by characteristic: at p=.003 for ladinas' use of modern contraceptives by household electricity status; at p<.001 for all others.

ing indigenous that cannot be explained by the variables included in the model.

Analyses controlled for mother's age at delivery (for pregnancy-related care only), current age (contraceptive use only),[16,17] parity[18] and current marital status.

RESULTS

Descriptive Results

Indigenous women generally had less education and less household wealth than ladina women, and larger proportions of indigenous women than ladina women lived in rural areas and communities where a low percentage of households had electricity.

Of pregnancies and deliveries among indigenous women, 41% occurred among those who reported having had no education, compared with 15% among their ladina counterparts (Table 1, page 100). Forty-two percent of pregnancies and deliveries among indigenous women occurred among those in the lowest household wealth quintile, compared with 14% among ladina women; 70% of pregnancies and deliveries among indigenous women occurred among those who lived in rural areas, compared with 47% among ladina women. Finally, among indigenous women, 56% of pregnancies and deliveries occurred

among those living in communities with the lowest percentage of electricity-containing households, compared with 32% among ladina women.

Among sexually active women who did not intend to become pregnant in the next 11 months, 37% of indigenous women but only 12% of ladina women reported having had no schooling (Table 2). Thirty-two percent of sexually active indigenous women were in the lowest household wealth quintile, compared with 8% of ladina women. Of sexually active indigenous women, 64% lived in rural areas, compared with 38% of ladina women. Finally, the proportion of sexually active indigenous women living in communities with the lowest percentage of electricity-containing households was nearly twice that among ladina women (50% vs. 26%).

In both ethnic groups, the percentages of pregnancies and deliveries among women of lower socioeconomic status and in rural areas were higher than the percentages of sexually active women of higher socioeconomic status and in urban areas, probably because of higher fertility among women of lower socioeconomic status and in rural areas.

Bivariate Results

Whereas large majorities of both indigenous and ladina women received institutional prenatal care (74% and 86%, respectively–Table 3), large ethnic disparities were observed for institutional delivery (36% vs. 73%) and met demand for modern contraceptives (49% vs. 72%).

Both institutional prenatal care and institutional delivery were used for a greater proportion of pregnancies among indigenous women who spoke Spanish than among those who did not; in addition, among indigenous women who wanted no births in the next 11 months, a greater proportion of those who spoke Spanish than of those who did not used modern contraceptives. In both ethnic groups, the proportion of pregnancies for which women used institutional prenatal care and delivery and the proportion of women who used modern contraceptives rose with schooling, household wealth and access to electricity. Those proportions were lower in rural areas than in urban areas. For example, 66% of pregnancies among indigenous women with no schooling had institutional prenatal care, compared with 98% of pregnancies among indigenous women who had completed secondary school. In all socioeconomic status and residential categories, the proportion of pregnancies or women that benefited from these three services was lower among indigenous than ladina women. For example, 21% of births to indigenous women with no schooling occurred in a medical facility, compared with 43% of those to unschooled ladinas. The ethnic disparity in institutional delivery was particularly large among women in the lowest quintiles of household wealth, rural areas and communities with the most limited access to electricity.

Among women with no schooling, 40% of indigenous women used modern methods, compared with 58% of ladinas; in addition, 36–42% of the indigenous women

who were poorest, lived in rural areas or in communities with the least access to electricity used modern methods, compared with 52–67% of their ladina counterparts.

Multivariate Results

Finally, we used a series of logistic regression models to identify associations between service use and selected characteristics among indigenous and ladina women. For institutional prenatal care, comparison between model 1 and models 2–5 indicates that the reduction of the coefficient for ethnicity was the greatest in models 3 and 4 (from −0.66 to −0.34 and to −0.33, respectively–Table 4). Fully adjusted results (model 6) show that education and household wealth were associated with the likelihood of using institutional prenatal care services but Spanish language fluency and residential variables were not. The coefficient for ethnicity remains negative, but it is no longer significant in this final model.

For institutional delivery (Table 5, page 104) the larg-

est reductions in the coefficient for ethnicity were between model 1 and models 2 and 4 (from −1.49 in model 1 to −0.75 in model 2 (with the addition of speaking Spanish) and to −0.96 in model 4 (with the addition of household wealth). According to the final model, the probability of institutional delivery is associated with speaking Spanish, education, household wealth and area of residence.

For met demand for modern contraception (Table 6, page 105), the largest reductions in the coefficient for ethnicity were between model 1 and models 2 and 4 (from −0.96 to −0.56, with the addition of Spanish language fluency, and from −0.96 to −0.63 in model 4, with the addition of household wealth). These results indicate that a language barrier and poverty were the two factors most strongly associated with indigenous women being less likely to use these services. In model 6, only Spanish language fluency and household wealth remained associated with met demand for modern contraceptives.

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TABLE 4. Coefficients from logistic regression models identifying associations between women's selected characteristics and the likelihood of their pregnancy receiving institutional prenatal care

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Indigenous	−0.66***	−0.37***	−0.34***	−0.33**	−0.45***	−0.13
Maternal age at delivery						
15–19	−0.63***	0.60***	−0.50***	−0.40***	−0.47***	−0.38**
20–29 (ref)	na	na	na	na	na	na
≥30	−0.12	−0.10	−0.12	−0.05	−0.08	−0.07
Parity						
1	1.64***	1.57***	1.05***	1.20***	1.42***	0.97***
2–3	0.75***	0.68***	0.40***	0.46***	0.58***	0.32***
≥4 (ref)	na	na	na	na	na	na
Marital status						
Married (ref)	na	na	na	na	na	na
Consensual union	−0.44***	0.46***	−0.35***	−0.36***	−0.42***	−0.36***
Formal union	−0.41*	−0.45**	−0.44**	−0.42*	−0.49**	−0.48**
Never in union	−0.81***	0.88***	−0.77**	−0.71**	−0.83**	−0.77**
Spanish language fluency	na	0.53***	na	na	na	0.20
Yrs. of school						
0	na	na	−3.05***	na	na	−2.33***
1–5	na	na	−2.68***	na	na	−2.07***
6	na	na	−2.15***	na	na	−1.70***
7–11	na	na	−1.39***	na	na	−1.16***
≥12 (ref)	na	na	na	na	na	na
Household wealth (quintile)						
Lowest	na	na	na	−2.33***	na	−0.91**
Second	na	na	na	−2.04***	na	−0.84**
Third	na	na	na	−1.90***	na	−0.96**
Fourth	na	na	na	−1.10***	na	−0.51
Highest (ref)	na	na	na	na	na	na
Area of residence						
Rural	na	na	na	na	−0.78***	−0.31
Urban	na	na	na	na	−0.31	−0.12
Capital (ref)	na	na	na	na	na	na
Households with electricity (tertile)						
Lowest	na	na	na	na	−0.40**	−0.15
Middle	na	na	na	na	0.05	0.16
Highest (ref)	na	na	na	na	na	na
Constant	*1.63***	*1.13***	*4.14***	*3.38***	*2.31***	*4.38***

*p<.05. **p<.01. ***p<.001. Notes: N=10,967 pregnancies. na=not applicable; variable was not included in the model.

TABLE 5. Coefficients from logistic regression models identifying associations between women's selected characteristics and the likelihood of their delivery taking place in an institution

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Indigenous	–1.49***	–0.75***	1.12***	–0.96***	–1.17***	–0.48***
Maternal age at delivery						
15–19	1.02***	–0.97***	0.86***	–0.66***	–0.74***	–0.57***
20–29 (ref)	na	na	na	na	na	na
≥30	0.49***	–0.47***	0.50***	–0.39***	–0.47***	–0.42***
Parity						
1	2.06***	2.00***	1.28***	1.33***	1.75***	1.15***
2–3	1.34***	1.23***	0.87***	0.85***	1.09***	0.69***
≥4 (ref)	na	na	na	na	na	na
Marital status						
Married (ref)	na	na	na	na	na	na
Consensual union	–0.12	–0.15	0.03	0.11	–0.04	0.08
Formal union	0.23	0.15	0.26	0.27	0.11	0.15
Never in union	–0.05	–0.24	0.05	0.15	–0.03	0.01
Spanish language fluency	na	1.57***	na	na	na	0.87***
Yrs. of school						
0	na	na	3.19***	na	na	–1.76***
1–5	na	na	2.57***	na	na	–1.51***
6	na	na	1.96***	na	na	–1.39***
7–11	na	na	0.96***	na	na	–0.77***
≥12 (ref)	na	na	na	na	na	na
Household wealth (quintile)						
Lowest	na	na	na	–3.41***	na	–1.41***
Second	na	na	na	–2.61***	na	–1.08***
Third	na	na	na	–1.92***	na	–0.83***
Fourth	na	na	na	–0.78***	na	–0.21
Highest (ref)	na	na	na	na	na	na
Area of residence						
Rural	na	na	na	na	–1.90***	–1.18***
Urban	na	na	na	na	–1.00***	–0.75***
Capital (ref)	na	na	na	na	na	na
Households with electricity (tertile)						
Lowest	na	na	na	na	–1.14***	–0.55***
Middle	na	na	na	na	–0.24	–0.04
Highest (ref)	na	na	na	na	na	na
Constant	*0.52***	*0.99***	*2.93***	*2.58***	*2.45***	*3.08***

*p<.05. **p<.01. ***p<.001. *Notes:* N=10,967 deliveries. na=not applicable; variable was not included in the model.

demand for contraception, ethnicity remained associated with use of services, suggesting that ethnic inequality is not explained entirely by linguistic, socioeconomic and residential differences between indigenous and ladina women.

Finally, to highlight ethnic inequalities in the use of these reproductive health care services, we decomposed them into the selected characteristics and the residual, using predicted probabilities (Figure 1, page 106). We calculated two predicted probabilities for each service: the first corresponding to a typical non–Spanish-speaking indigenous woman and the second corresponding to a typical ladina woman. "Typical" means that she possessed the weighted mean values for years of school, household wealth and residential characteristics in the sample for her ethnic group. We decomposed the differences between indigenous and ladina women into five areas: Spanish language fluency, years of school, household wealth, rural residence and

the residual. For example, if an indigenous woman speaks Spanish, but otherwise possesses characteristics that are typical to other indigenous women, then her predicted probability is the sum of the areas corresponding to "indigenous" and "Spanish language fluency." If in addition to speaking Spanish, an indigenous woman has the same average years of school as the sample of ladinas, then her predicted probability is the sum of the areas corresponding to "indigenous," "Spanish language fluency" and "years of school." Even if an indigenous woman speaks Spanish and has the mean values for all selected characteristics in the sample of ladina women, her probability of use does not equal that of a typical ladina woman, and the difference is represented by the area labeled "residual."

As discussed previously, ethnic disparity was greatest for institutional delivery, followed by met demand for modern contraceptives and institutional prenatal care. For

TABLE 6. Coefficients from logistic regression models identifying associations between women's selected characteristics and the likelihood of their having a met demand for modern contraceptives

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Indigenous	–0.96***	–0.56***	–0.74***	–0.63***	–0.79***	–0.41***
Maternal age at delivery						
15–19	–0.32	–0.27	–0.24	0.05	–0.16	–0.02
20–29 (ref)	na	na	na	na	na	na
≥30	–0.08	–0.02	–0.04	0.15	0.02	0.13
Parity						
0	1.40***	–1.41***	–1.86***	–1.90***	–1.60***	–1.94***
1	0.17	0.08	–0.25*	–0.32*	–0.05	–0.39**
2–3	0.39***	0.30***	0.11	0.05	0.22**	–0.02
≥4 (ref)	na	na	na	na	na	na
Marital status	na	na	na	na	na	na
Married (ref)	na	na	na	na	na	na
Consensual union	0.09	0.08	0.17*	0.19*	0.12	0.18*
Formal union	0.53	0.47	0.58	0.55	0.48	0.52
Never in union	1.21***	1.09***	1.17***	1.13***	1.12***	1.06***
Spanish language fluency	na	0.89***	na	na	na	0.51***
Yrs. of school						
0	na	na	–0.95***	na	na	–0.30
1–5	na	na	–0.52***	na	na	–0.11
6	na	na	–0.16	na	na	0.04
7–11	na	na	0.24	na	na	0.23
≥12 (ref)	na	na	na	na	na	na
Household wealth (quintile)						
Lowest	na	na	na	–1.33***	na	–0.85***
Second	na	na	na	–0.90***	na	–0.59***
Third	na	na	na	–0.57***	na	–0.37*
Fourth	na	na	na	0.05	na	0.10
Highest (ref)	na	na	na	na	na	na
Area of residence						
Rural	na	na	na	na	–0.61***	–0.16
Urban	na	na	na	na	–0.20	–0.04
Capital (ref)	na	na	na	na	na	na
Households with electricity (tertile)						
Lowest	na	na	na	na	–0.33***	0.08
Middle	na	na	na	na	–0.04	0.06
Highest (ref)	na	na	na	na	na	na
Constant	0.80***	–0.06	*1.25****	*1.28****	*1.28****	*0.74****

*p<.05. **p<.01. ***p<.001. *Notes:* N=7,529 women. na=not applicable; variable was not included in the model.

institutional delivery and met demand for modern contraceptives, lack of Spanish fluency made up the largest portion of the ethnic difference. Whereas three remaining factors—years of school, household wealth and rural residence—and the residual equally accounted for the ethnic disparity in the use of institutional delivery, ethnic differences in education and rural residence made substantially smaller contributions than other characteristics and the residual toward indigenous women's lower likelihood of having a met demand for modern contraceptives.

DISCUSSION AND CONCLUSION

The results of this study suggest that although the proportion of indigenous women who use institutional prenatal care has grown in recent years,[4] the proportions who use institutional delivery services and modern contraceptives are still far lower than the proportions among ladinas. Our

results also suggest that the language barrier for women who do not speak Spanish is the most important obstacle in indigenous women's use of these services. Compared with other characteristics contributing to the ethnic differential in met demand for modern contraceptives, rural residence and education are less important. That rural residence is not a barrier to indigenous women's modern contraceptive use is consistent with previous findings that Guatemalans' contraceptive access does not differ significantly by ethnicity[5] because of decades-long family-planning programs and mass media messaging that have targeted the rural Mayan population.[6]

However, our multivariate results also suggest that a statistically significant portion of ethnic differences in the use of institutional delivery services and met demand for modern contraceptives cannot be explained by a language barrier or ethnic differences in socioeconomic status and rural

FIGURE 1. Predicted probabilities of use of institutional prenatal care, having an institutional delivery and having a met demand for modern contraceptives, according to ethnicity
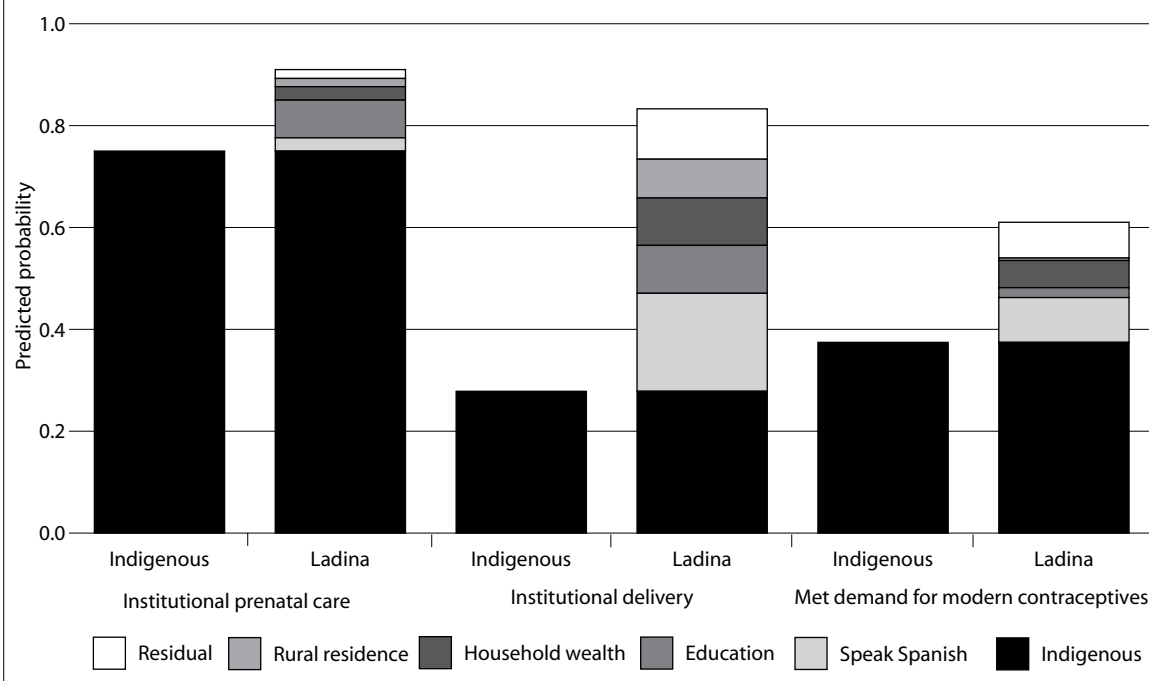
residence. In qualitative studies, social and cultural contexts are important factors in the persistent differences between indigenous and ladino Guatemalan women's use of modern medical services. Traditional midwifery and modern pregnancy-related care are often seen as complementary in Guatemala:[11,19] As a result of the government's efforts to integrate traditional midwives into the formal health care system,[12] many indigenous women who see traditional midwives also receive institutional prenatal care, often on their midwives' referral. Approximately 40% of pregnancies among indigenous women who received institutional prenatal care also received care from a traditional midwife.

However, childbearing is highly ritualized in indigenous communities, where traditional midwives often assume symbolic and mystical roles and provide not only physical but also social and spiritual care.[20,21] Furthermore, indigenous women continue to prefer traditional midwives for assistance at delivery.[12,22–23] Unfortunately, even trained midwives often lack knowledge of basic aseptic techniques, fail to recognize danger signs quickly and are not prepared to handle delivery complications. These shortcomings are considered contributing factors to the relatively high maternal and infant morbidity and mortality in rural and indigenous areas of Guatemala.[21]

The mystical meaning attached to women's reproduction also contradicts the idea that fertility can be calculated or controlled. Rather than considering pregnancy and childbearing to be health concerns or biomedical issues, indigenous people tend to think that fertility is predetermined by God[10] and associate contraceptive use with "killing."[24] In an auxilliary analysis, 13% of indigenous women, compared with 4% of ladinas, considered the ideal number of children to be "as many as God wants."

The tendency of indigenous Guatemalan women to avoid modern medical care has been reinforced by ladinos' ongoing discrimination against indigenous people. Such discrimination was manifested in the often brutal treatment that indigenous people received at the hands of government troops, who annihilated 440 indigenous villages during the 30-year Guatemalan civil war from 1960 to 1996. The disproportionately large number of indigenous casualties reflects deep-rooted ethnic discrimination in Guatemala. Although the civil war ended in 1996, indigenous people's ongoing distrust of the ladino government may make them hesitant to seek health care services at government-run facilities, whose personnel are predominantly ladino.[25,26] Indigenous people are particularly suspicious of government-run family planning programs, which many perceive as part of a ladino "plot" to diminish the indigenous population.[24]

Our study has at least two important implications. First, our finding that a large portion of ethnic differences in the use of institutional delivery services and modern contraceptives was attributable to indigenous women not speaking Spanish suggests that increasing the number of health care personnel who speak the local Mayan language may raise the use of institutional health care services among indigenous people. Improved communication should facilitate the provision of unbiased information about the benefits of using modern care, including treatment for adverse consequences of pregnancy and delivery complications, and the benefits of child spacing.[27]

Second, the relatively large proportion of indigenous women who use institutional prenatal care suggests that their use of institutional delivery and family planning services could be increased by further integrating the three services. Mothers who use modern, pregnancy-related health care services are more likely to use modern contraceptives than those who do not;[28–31] moreover, these services and family planning programs are often integrated within a single institution to assist clients' use of all services and improve the logistic and financial efficiency of service provision.[32,33] In its effort to allocate limited health care resources to those who need them most, the Guatemalan Ministry of Health depends on traditional midwives to refer women with obstetric risks to health facilities that provide emergency obstetric and neonatal care; this approach requires caution, however, because midwives may not be prepared to assess biomedical risks or work with the formal health care system to ensure the rapid resolution of such risks.[23,34] Instead, using traditional midwives as a social resource may increase acceptance for referral among pregnant women. For example, Casa Materna, a maternity waiting home, provides an integrated health program that is run in partnership with the Ministry of Health, UNICEF and a local association of midwives in Huehuetenango, and includes prenatal, postnatal and infant health care services, family planning and well-woman health screening (Pap smears); its primary function is to care for and monitor at-risk women with advanced pregnancies, who then deliver at the government hospital located immediately adjacent to the home.[27] Employing traditional midwives as advocates has been key to their success in this referral system between facilities, as they play a central role in encouraging women to accept referrals to hospital-based services when necessary.

Finally, as in analyses from other Latin American countries,[35,36] an auxiliary analysis shows that one-third of deliveries that occurred in an institution in Guatemala were caesarean sections. The potential association between institutional deliveries and caesareans may exacerbate indigenous women's fear of biomedical services.[23] Thus, by effectively allocating limited health care resources, increasing institutional capacity for delivery assistance and reducing unnecessary caesarean sections (and their potentially adverse effects), Guatemala may help reduce the barrier between indigenous women and the reproductive health services they need. Future studies should continue monitoring the association between ethnic disparities and Guatemalan women's receipt of these services.

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RESUMEN

Contexto: *Guatemala tiene unos de los índices más bajos de salud reproductiva y las más grandes disparidades en salud en América Latina, particularmente entre las mujeres indígenas y las ladinas. Para reducir estas disparidades, es necesario comprender la forma en que las desventajas lingüísticas, socioeconómicas y residenciales de las mujeres indígenas se relacionan con su subutilización de los servicios de salud reproductiva.*

Métodos: *Se usaron análisis de regresión logística de una muestra representativa de mujeres en edades de 15–49 tomados de la Encuesta Nacional de Salud Materno Infantil 2008–2009 para estimar las disparidades étnicas en el uso que hacen las mujeres de los servicios prenatales y de parto, así como en la demanda satisfecha de anticonceptivos modernos. Con base en probabilidades predichas, estimamos hasta qué punto dichas disparidades entre mujeres indígenas y ladinas fueran atribuibles a las barreras del lenguaje que enfrentan las indígenas, así como a su desventaja socioeconómica y su residencia en áreas rurales.*

Resultados: *La diferencia étnica en el uso de servicios institucionales de atención prenatal fue pequeña; sin embargo, una proporción mucho menor de las mujeres indígenas que las mujeres ladinas dieron a luz en una institución de salud (36% vs. 73%); asimismo, fue importante la diferencia en la proporción con necesidad de anticonceptivos modernos satisfecha (49% vs. 72%). El hecho de no hablar español explicó la mayor parte de estos diferenciales étnicos. La deficiente escolaridad de las*

mujeres indígenas y su residencia en el medio rural explicaron una menor parte del diferencial étnico en el uso de anticonceptivos modernos comparado con su desventaja económica.

Conclusión: *El hecho de que una alta proporción de mujeres indígenas usan los servicios de atención prenatal sugiere que una mayor integración de los tres servicios–prenatales, durante el parto y de la planificación familiar–puede aumentar el nivel de partos que ocurren en instituciones de salud y el uso de los anticonceptivos modernos. Incorporar personas que hablen los lenguajes mayas locales al personal de las instituciones de salud podría también ayudar a aumentar el uso de estos servicios.*

RÉSUMÉ

Contexte: *Le Guatemala présente certains des indices de santé reproductive les plus faibles et des plus grands écarts de santé en Amérique latine, en particulier entre les femmes indigènes et ladina. Pour combler l'écart, il faut comprendre le rapport entre le désavantage linguistique, socioéconomique ou résidentiel des femmes indigènes et leur sous-utilisation des services de santé reproductive.*

Méthodes: *Les inégalités ethniques de recours des femmes aux soins prénatals et d'accouchement institutionnels et de demande satisfaite de contraception moderne ont été estimées par analyses de régression logistique d'un échantillon nationalement représentatif de femmes âgées de 15 à 49 ans extrait de l'enquête nationale 2008–2009 de santé maternelle et infantile. Par probabilités prédites, nous avons estimé la mesure dans laquelle ces inégalités sont attribuables à l'obstacle de la langue parmi les femmes indigènes et à leur désavantage au niveau de certaines caractéristiques socioéconomiques et résidentielles.*

Résultats: *La différence ethnique de recours aux soins prénatals institutionnels est faible. L'accouchement en milieu institutionnel est cependant beaucoup plus rare parmi les femmes indigènes que parmi leurs homologues ladina (36% par rapport à 73%), de même que le besoin satisfait de contraception moderne (49% par rapport à 72%). Le fait de ne pas parler espagnol explique en grande partie ces différences ethniques. La faible scolarisation et la résidence en milieu rural des femmes indigènes expliquent en moindre proportion la différence ethnique d'usage de la contraception moderne, par rapport à leur désavantage économique.*

Conclusion: *La grande proportion des femmes indigènes qui ont recours aux soins prénatals institutionnels laisse entendre qu'une intégration accrue des trois services pourrait accroître leur recours à l'accouchement institutionnel et à la contraception moderne. L'ajout d'un personnel parlant les langues mayas locales dans les établissements de santé pourrait aussi être utile.*

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