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Contraceptive Dynamics in Guatemala: 1978–1998

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Context: *Guatemala lags far behind other Central American countries in contraceptive prevalence, and levels of use differ markedly between Mayans and ladinos, the two main ethnic groups. Understanding the factors that influence contraceptive use is critical to the efforts of programs to increase prevalence.*

Methods: *Data from four national-level surveys are used to examine trends in contraceptive use between 1978 and 1998. Results of multivariate analyses show the extent to which various factors, particularly ethnicity and access, influence contraceptive dynamics.*

Results: *Between 1978 and 1998, the proportion of women using any contraceptive rose from 28% to 50% among ladinos, but only from 4% to 13% among Mayans. Female sterilization, the pill and rhythm have been the most widely used methods, although as of 1998, the injectable replaced the pill as the third most popular method among Mayans. The source of methods has shifted over time, but Mayans and ladinos have used similar sources at each survey. Dramatic changes in socioeconomic conditions among both ladinos and Mayans over these 20 years have been key determinants of contraceptive use; access to services is also a significant correlate of use among Mayans, once socioeconomic factors are controlled for.*

Conclusions: *Mayans are a "hard-to-reach" population, but they are becoming more open to adopting family planning when services are accessible and provided in a culturally acceptable manner.*

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Latin America has made remarkable strides regarding contraceptive use and fertility decline in the past three decades. Thirty years ago, the total fertility rate for the region was around 6.0 lifetime births per woman; by 1999, it had dropped to 2.9. This same dramatic decline has not occurred in Guatemala, where the total fertility rate remains at 5.1, the highest in Central America. The contraceptive prevalence rate (including all methods) of 38% among 15–49-year-old women in union lags far behind those of neighboring countries, which range from 47% to 75%.[1]

The population of Guatemala totals 12.3 million and is divided roughly in half between the Spanish-speaking and economically dominant ladinos and the less-affluent, more rural Mayan (indigenous) populations. The latter consist of some 22 major groups, who remain linguistically and culturally isolated from ladino society as well as from each other. On every major health, economic and social indicator, the Mayans fare far worse than the ladino population. Low levels of education and residence in rural areas have made it difficult for the Mayan groups to integrate into the mainstream of Guatemala society.

Moreover, decades of political and economic oppression have resulted in widespread discrimination against Mayans and, in turn, their distrust of the ladino population.[2] As descendants of one of the greatest civilizations in the Western Hemisphere, the Mayans remain fiercely proud of their heritage and suspect those who wish to change their ways in the name of progress. During the peak of the civil unrest in Guatemala during the 1980s, whole villages were massacred and many Mayans were forced to leave the country, further reinforcing Mayans' distrust of outsiders. In the eyes of many Mayans, the promotion of family planning (interpreted as not having children or as killing babies) reflects similar genocidal motives.[3]

Family planning began in Guatemala as it did in many Latin American countries: as a response of a group of concerned physicians, nurses, sociologists and social workers to unwanted pregnancy. In 1965, the first family planning clinic opened in Guatemala City, under the auspices of the recently established International Planned Parenthood Federation affiliate, the Asociación Pro Bienestar de la Familia Guatemalteca (APROFAM). In the early 1970s, the Ministry of Health established the Integrated Office of Information, Education and Training, and promised to provide family planning services through some 450 facilities throughout the country. However, from 1970 to 1999, the government never fully embraced family planning, although it continued to accept funding from the U.S. Agency for International Development (USAID) for population activities during most of this period.

APROFAM continues to be the primary source of contraceptives in Guatemala, with 26 clinics and a network of community-based distribution posts. The social marketing program IPROFASA (Importadora de Productos Farmaceuticos, S.A.) has increased access to contraceptives, especially in urban areas, and the social security program became more active in family planning in the late 1990s. Nongovernmental organizations (both international organizations, such as CARE and the Population Council, and local organizations) are working to expand services into rural Guatemala. The government of Alfonso Portillo, installed in January 2000, has shown greater interest in family planning than its predecessors and is trying to

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push through legislation favorable to family planning and reproductive health.

In this article, we provide an in-depth analysis of contraceptive dynamics among Mayans and ladinos over the 20-year period 1978–1998. Our analysis goes beyond previously published work in four ways. First, it examines trends in key contraceptive measures (use, method mix and source) and how these patterns differ by ethnic group. Second, it examines the extent to which contraceptive practice varies among Mayan groups. Third, it constitutes the first attempt to measure the effect of access to services on contraceptive use in Guatemala, by linking data from individual questionnaires and a facility-based survey in four departments (administrative units that are larger than counties). Fourth, it examines the determinants of contraceptive use for the population as a whole, as well as for Mayans in particular. In sum, this analysis provides further insight into the effect of ethnicity on contraceptive dynamics in a country that deviates markedly from the norm for Latin America.

Methodology

Five national-scale, representative surveys of women of reproductive age in Guatemala were available for analysis.* Two of these, from 1978 and 1983, were conducted with technical assistance from the U.S. Centers for Disease Control.[4] The other three were conducted in collaboration with Macro International: Demographic and Health Surveys (DHS) from 1987 and 1995–1996, and a mini-DHS from 1998.[5] Because of technical problems with the 1983 data set, those data are excluded from this analysis.†

The 1995–1996 survey was carried out in connection with a 1997 provider survey. Of the five surveys, only the 1995–1996 DHS provides reliable estimates of differences among Mayan linguistic groups, as a result of oversampling in four departments.

Estimates of the proportion Mayan in the Guatemalan population range from 40% to 60%; the exact number remains elusive for two reasons. First, ethnic identity is defined according to cultural dimensions—such as race, language and history—rather than strict, measurable criteria.[6] Indeed, the classification cannot be based on physical appearance alone. An indigenous person who gives up native dress and learns to speak Spanish well can in time classify himself as ladino. Second, the criteria for defining ethnicity are not consistent across censuses and surveys. Different approaches to classifying respondents have included hiring interviewers from the local area who "know" the ethnicity of respondents (1964 census); operationally defining Mayans as those who use native dress or speak a Mayan dialect at home;[7] relying on observation alone (the primary method in recent DHS surveys); and using self-report of the respondent. A recent resurgence of identification with the Mayan race (a sort of ethnic pride) may improve self-reporting of ethnicity in future surveys, as Mayans feel more comfortable about claiming their ethnic identity.[8]

An important part of this analysis was to identify the determinants of contraceptive use in Guatemala. Ideally, one would like to measure the relative importance of demand and supply factors in contraceptive use among ladinos and Mayans, and to identify changes in these determinants over time. Demand factors include a series of demographic and socioeconomic variables (age, employment outside the home, education, urban-rural residence, and ownership of radio and television),‡ as well as ethnicity. A key supply factor is access to contraceptive services, measured by distance or travel time to the nearest facility offering modern methods.

However, we were constrained by lack of data to run this model. Linguistic subgroup was not available for analysis on any survey except the 1995–1996 DHS. For access, the preferred methodology is to link data from a household survey to data from a facility-based survey in the same geographic area. Such data, too, were available only from the 1995–1996 DHS, and even then, for only four of Guatemala's 22 departments. Thus, we are able to test the role of access on contraceptive use for one area of the country at one point in time but not for the country as a whole and over time.

In sum, with the available data, we were able to perform three analyses: one on the determinants of contraceptive use (excluding access) among Guatemalan women over the past 20 years; one on factors that influence contraceptive use among Mayans only (1995–1996); and one on the role of access in determining contraceptive prevalence in four departments (based on the 1995–1996 DHS and 1997 facility-based survey).

We used logistic regression for all three analyses. Contraceptive use was defined to include all methods for the first two analyses and modern methods only for the third. The odds ratios from these analyses indicate the relative importance of each independent variable in comparing contraceptive users with nonusers.

For the analysis over time, we pooled and weighted each observation for women in union aged 15–49 from the four surveys, for a total of 17,482 women. Ethnicity was entered as a dummy variable (0 for ladino vs. 1 for Mayan) to capture unexplained differences in contraceptive use between these groups. Interaction terms (between ethnicity and the remaining explanatory variables) allowed us to test the hypothesis that education, economic status and related variables have a different effect on contraceptive use among Mayans versus ladinos. Dummy variables were included for the three departments with the largest cities (Guatemala City, Quetzaltenango and Escuintla) to capture the possible effects of urban residence, such as greater access to services or greater exposure to outside ideas. Finally, dummy variables were used for the years 1987, 1995 and 1998 to detect unexplained increases in contraceptive use with the passage of time; if not explained by other factors, such increases could well reflect effects of the family planning program that are not explicitly measured in this model.

For the analysis of factors influencing contraceptive use among Mayans only, data on 3,075 Mayan women aged 15–49 who were married or in union were available for analysis. The explanatory variables were the same as those described directly above. However, several changes were needed. Since the study was done in a single time period, we dropped the variable for year. A new dummy variable for urban residence replaced those for specific cities from the first analysis. Also, ability to speak Spanish was included as a dummy variable. To test for differences in prevalence among Mayan subgroups, we created additional dummy variables for the language spoken at home (Spanish, Kaqchikel, Q'eqchi', Mam, Poqomchi', other). Since the K'iche' are the largest linguistic group and have one of the lowest contraceptive prevalence rates, we chose them as the reference category.

Finally, the 1997 Provider Census Supplement (or the "provider survey") affords the first opportunity to systematically

*The 1978 and 1987 surveys were limited to women aged 15–44, while the others included women 15–49. The multivariate results presented below proved robust when respondents aged 45–49 were excluded to achieve age comparability.

†The total number of respondents was 3,607 in 1978; 5,160 in 1987; 12,403 in 1995–1996; and 6,021 in 1998. However, the multivariate analyses were limited to married women aged 15–49, totaling 1,953 in 1978; 3,377 in 1987; 8,107 in 1995–1996; and 4,045 in 1998.

‡The 1978 survey did not collect information on a number of variables that appeared in the later surveys, making it impossible to include them in a model that looked at change over the 20-year period.

Table 1. Percentage of 15–49-year-old women in union with selected characteristics, by year of survey, according to ethnicity, Guatemala

Characteristic	1978	1987	1995	1998
Works outside home				
All	10.8	14.5	28.9	30.7
Ladino	11.7	17.5	32.9	33.6
Mayan	9.4	9.6	21.5	24.6
Owns radio				
All	73.9	65.5	80.3	81.6
Ladino	80.9	70.8	84.9	84.0
Mayan	63.2	56.9	71.9	76.5
Owns television				
All	17.9	30.2	51.2	57.9
Ladino	28.7	43.5	65.9	70.7
Mayan	1.6	8.6	24.2	30.3
No education				
All	59.0	46.3	34.9	30.9
Ladino	40.2	28.9	20.5	18.0
Mayan	87.5	74.6	61.4	58.9
Primary education				
All	33.7	44.6	47.7	49.7
Ladino	48.1	57.0	53.9	54.6
Mayan	12.0	24.4	36.3	39.2
Secondary education				
All	6.5	8.1	14.4	17.2
Ladino	10.4	12.5	21.0	24.3
Mayan	0.5	0.9	2.1	1.7
University education				
All	0.8	0.9	2.9	2.1
Ladino	1.3	1.5	4.5	3.0
Mayan	0.0	0.0	0.2	0.1

study the role of access on contraceptive use in Guatemala, at least in the four highland departments in which it was carried out: Sololá, Totonicapan, Quetzaltenango and San Marcos.[9] Although the results cannot be generalized to all of Guatemala, they are of considerable interest, since they allow for comparisons between the two major ethnic groups with regard to access and its effect on contraceptive use. Mayans between the ages of 15 and 49 constituted 63% of the total population in these four departments (91% in Sololá, 96% in Totonicapan, 32% in Quetzaltenango and 38% in San Marcos).

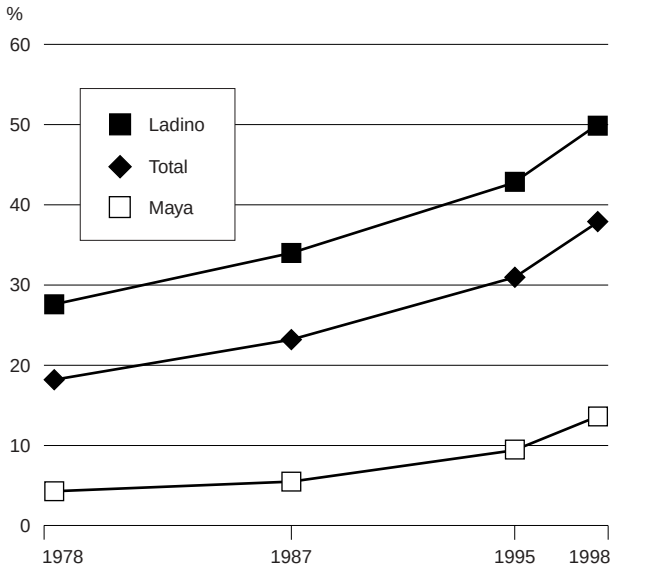
The analysis of the role of access used a variant of the model described for the analysis over time. Dummy variables for year and for the three largest cities were dropped, although "urban" was added as a place of residence. As in the first analysis, interaction terms—between ethnicity and the remaining explanatory variables—were entered to test the hypothesis that socioeconomic factors and access to services have different effects on contraceptive use among Mayans and ladinos. Access to family planning services was measured in terms of travel time and entered into the model as a dummy variable.* The mean number of health facilities per community (defined to be within a two-hour limit) was 4.3; the median, three facilities. After reducing the sample to women in union aged 15–49, we had information on 1,979 women for analysis in the full model. In this analysis, we defined access as living within 10 minutes of a facility.

Results

Socioeconomic Characteristics

Mayan and ladino respondents were about the same age (30–32 years, on average) over the four surveys. They differed markedly, however, on selected socioeconomic variables (Table 1): Ladino women were more likely than Mayans to work outside the home and to own a radio or television (proxies for economic status), and they had higher levels of education. However, both groups showed dramatic improvements on key variables over the 20-year period. Among Mayans, the proportion of women with some primary education more than tripled, rising from 12% to 39%. Similarly, the proportion working outside the home increased from 9% to 25%. The proportion of Mayans reporting television ownership shot up from only 2% in 1978 to 30% in 1998. Ladino women showed similar gains in education and television ownership.

Figure 1. Percentage of women using a contraceptive method, by year, according to ethnicity



Contraceptive Prevalence

Contraceptive use contrasts starkly between ladinos and Mayans in Guatemala (Figure 1). The prevalence of use of any method among ladinos has increased steadily from 28% in 1978 to 34% in 1987 and to 50% in 1998; the change among the Mayan population has been very small, from 4% in 1978 to 6% in 1987 and 13% in 1998.† For both groups in each survey, modern methods represented at least 65% of all use.‡ Despite the presence of family planning services in Guatemala for more than 30 years, the current levels of contraceptive prevalence among Mayans more closely resemble those of Africa than those seen elsewhere in Latin America.

Method Mix

Over the past 20 years, three methods have dominated contraceptive use in Guatemala: female sterilization, the pill and rhythm (Table 2). Female sterilization has been the leading method for both Mayan and ladino users in every survey period.

Rhythm is by far the most widely used of the so-called traditional methods, constituting 78% of all traditional method use among Mayans in 1998. In contrast to the pill and female sterilization, which are clearly defined methods, "rhythm" may have a variety of meanings, especially in populations with low levels of education. Although we cannot discern these differences from the available data, respondents may say they rely on rhythm in any of the following circumstances: They carefully monitor menstrual cycles with a calendar or thermometer (or both), following formal training from a family planning worker; they avoid sexual relations during the period when they believe they are the most fertile; they occasionally or regularly avoid relations in hopes of preventing pregnancy; or they are reluctant to admit that they are not practicing contraception, especially if they do not want to become

*We used travel time rather than distance as our access measure because many key informants knew the time necessary to travel to a particular facility, but not the actual distance.

†The published figures for prevalence in Guatemala are based on married women 15–44 in 1978 and 1987, and on married women 15–49 in 1995 and 1998–1999.

‡Modern methods are the pill, IUD, injectable, implant, male and female sterilization, condom and spermicides. Traditional methods are rhythm, withdrawal and traditional herbs.

Table 2. Percentage distribution of contraceptive users, by method, according to year and ethnicity

Method	1978			1987			1995–1996			1998		
	All	Ladino	Mayan	All	Ladino	Mayan	All	Ladino	Mayan	All	Ladino	Mayan
Female ster.	31.9	32.0	30.9	44.6	44.0	50.7	45.5	45.8	42.4	43.7	45.0	33.2
Pill	29.3	29.4	28.5	17.0	16.9	18.3	12.2	12.3	11.3	13.1	13.2	12.1
Rhythm	15.2	14.3	23.9	12.3	12.1	14.1	11.4	10.2	21.5	14.8	13.2	28.4
IUD	7.9	7.8	9.2	7.8	8.4	1.4	8.2	8.4	6.2	5.6	6.0	2.4
Injectable	6.0	5.9	6.0	2.0	1.7	5.6	7.9	7.9	7.3	10.1	9.6	14.4
Condom	4.0	4.3	1.6	5.0	5.5	0.0	7.0	7.3	4.2	6.0	6.7	0.9
Male ster.	2.2	2.4	0.0	4.0	3.8	5.6	4.7	4.7	4.8	2.1	2.0	2.3
Withdrawal	1.9	2.1	0.0	5.2	5.3	4.2	2.8	2.9	1.7	4.0	3.8	5.3
Barrier	2.2	2.4	0.0	1.5	1.7	0.0	0.1	0.1	0.0	0.1	0.1	0.0
Other	0.4	0.5	0.0	0.5	0.6	0.0	0.2	0.1	0.7	0.4	0.3	0.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

pregnant. Indeed, in the 1998 survey, only 40% of respondents reporting that they use rhythm were able to correctly identify their fertile period.

Whereas method preference was quite similar among users in the two ethnic groups between 1978 and 1995, the patterns of method mix begin to diverge in the most recent DHS. Female sterilization remains number one; however, the proportion of users relying on this method is lower among Mayans (33%) than ladinos (45%). For Mayan users, rhythm is almost as widespread (28%) as female sterilization. Of note, the injectable has become the third most widely used method among Mayans (representing 14% of use), and the pill has dropped to fourth place (at 12%). Among ladino users, by contrast, female sterilization is now far more prevalent than either the pill or rhythm (both at 13%); the injectable is in fourth place (10%). Condoms remain relatively underutilized, with levels of use never reaching more than 7% of ladino users and 4 % among Mayans.

In sum, despite the vastly different levels of contraceptive prevalence between ladinos and Mayans, the pattern of method mix has been surprisingly similar for the two groups, at least through the mid-1990s. However, the 1998 survey suggests some divergence in method preference.

Source of Method

Data on source of modern methods by ethnic group and year of survey reveal several contrasts between the two groups, as well as certain similarities (Table 3). For the population as a whole, the past 20 years have seen a marked shift in source of contraception, with the proportion of women relying on APROFAM increasing from 14% in 1978 to around 40% in the later years. Over this same 20-year period, use of Ministry of Health services has dropped off notably, from 44% in 1978 to 22% in 1987 to 17% in 1995 and 21% in 1998. The health ministry vacillated between being neutral and negative toward family planning during this period, at times calling a moratorium on service delivery, commodities distribution or training of personnel.[10]

Use of private facilities (primarily doctors' offices, but also private hospitals, clinics and nongovernmental organizations other than APROFAM) has remained quite constant for the population as a whole, varying from 13% to 19% over the four surveys. The contribution of the Guatemala Social Security Institute has increased over time, from 7% in 1978 to 14% in 1998. Pharmacies have been the source of contraceptives for 7–16% of users. Finally, government health workers have played a minimal role in providing methods to contraceptive users (1–4%).

Certain ethnic differences are evident with regard to source of supply. Given the small number of Mayans reporting any contraceptive use, especially in 1978 and 1987, the data should be interpreted with caution. Among women practicing contraception in 1978, ladinos were more likely than Mayans to use the services of APROFAM for supply, although the reverse was true by 1998. In each survey, the few Mayans using contraceptives were more likely than ladinos to report getting their method from the Ministry of Health, and they were less likely to mention the pharmacy as their contraceptive source.

APROFAM has been the major service provider for ladino users since the mid-1980s, and for Mayan users since the mid-1990s. The role of the Ministry of Health in delivering family planning services has dropped off for both groups.

Use Among Subgroups of Mayans

In 1995–1996, the sampling strategy for the national survey, combined with oversampling in four departments, yielded data representative at the departmental level for nine departments, seven of which were predominantly Mayan. As a result, five Mayan linguistic groups were represented by at least 350 respondents each. Thus, the 1995–1996 survey provided the first opportunity to date to better understand differences in contraceptive use among Mayans by department and by language group.

Table 4 (page 116) shows markedly higher levels of use of any method among Mayans in the two major urban areas (18% in Guatemala City and 22% in Quetzaltenango) than in the remaining departments (none exceeding 9%). This disparity is seen even more vividly in the proportions in urban and rural areas using any contraceptive method: 22% and 6%, respectively. If one limits the analysis to modern methods, the disparity remains, but the proportions using decline.

Mayans from a particular linguistic group tend to live in contiguous areas; however,

Table 3. Percentage distribution of users of modern contraceptives, by source of method, according to year and ethnicity

Source	1978			1987			1995–1996			1998		
	All	Ladino	Mayan	All	Ladino	Mayan	All	Ladino	Mayan	All	Ladino	Mayan
APROFAM	13.7	14.7	4.3	36.7	37.0	34.5	42.0	41.7	44.2	38.2	37.4	47.6
Ministry of Health	44.2	43.4	52.3	21.5	20.0	36.2	17.1	16.4	24.1	20.6	19.7	29.7
Private facilities†	15.7	15.3	19.6	18.7	19.3	12.1	17.6	17.8	15.5	12.5	12.9	7.7
Social Security Institute	6.8	6.9	6.1	9.7	10.0	6.9	8.1	8.2	6.8	13.7	14.9	1.0
Pharmacy	15.9	16.9	6.1	7.4	7.6	5.2	11.7	12.4	5.6	11.9	12.6	4.3
Health worker	1.2	0.6	7.8	3.5	3.6	1.7	1.5	1.5	1.9	1.1	1.0	1.6
Other	2.4	2.3	3.9	2.5	2.4	3.4	2.0	2.0	1.9	2.0	1.4	8.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

†Private physicians, hospitals, clinics and nongovernmental organizations other than APROFAM.

Table 4. Percentage of Mayan women using any method of contraception and percentage using a modern method, by selected characteristics, 1995–1996

Characteristic	N	Any method	Modern method
Department†			
Guatemala City	141	17.7	14.9
Quetzaltenango	155	21.9	16.1
Chimaltenango	547	8.8	5.7
Alta Verapaz	618	7.6	5.0
San Marcos	210	5.2	4.8
Sololá	459	5.9	2.4
Huhuetenango	466	5.6	5.2
K'iche'	457	5.0	3.9
Totonicapan	488	3.3	2.3
Place of residence			
Urban	642	21.5	17.2
Rural	3,020	6.2	4.4
Linguistic group (all departments)			
Spanish	756	19.0	14.6
Q'eqchi'	519	6.7	3.7
Kaqchikel	552	4.9	3.0
Mam	395	6.6	5.6
K'iche'	906	3.1	2.3
Poqomchi'	75	1.3	1.3
Other	338	4.1	3.3
Linguistic group (excluding Guatemala City and Quetzaltenango)			
Spanish	602	13.5	9.5
Q'eqchi'	518	6.8	3.7
Kaqchikel	484	5.2	3.1
Mam	362	6.6	5.8
K'iche'	866	2.1	1.4
Poqomchi'	75	1.3	1.3
Other	338	4.1	3.3

†Only those for which estimates are valid at the departmental level are included. *Note:* Based on 15–49-year-old women in union.

these areas may span two or more departments. Table 4 also shows the proportion of Mayan women, married or in union, using any method or using a modern contraceptive method as of 1995–1996, by linguistic group (defined as the language spoken at home). Although potentially more useful than the analysis by department, this analysis is clouded by the substantial number of Mayans from different linguistic groups living in major urban areas. When those living in either Guatemala City or Quetzaltenango are excluded (last panel of Table 4), levels of use of any method range from 1% to 14% for the different groups. The proportions using a modern method of contraception are slightly lower, ranging from 1% to 10%.

Determinants of Use Among All Women

What determines contraceptive use in Guatemala? The first part of the analysis tested seven socioeconomic variables (ethnic group, age, works outside the home, radio ownership, television ownership, education and residence in a city) as potential factors. All seven were significant (Table 5). Use was reduced among Mayan women and was elevated among respondents who were employed outside the home, owned a radio or television, and resided in a city; it also rose as age and education increased. The largest differentials were found for women with a secondary or university education, when compared with those who had had no schooling.

When the socioeconomic variables were controlled for, Guatemalan women in 1987 and 1995 were not significantly more likely to use contraceptives than were their counterparts in 1978, indicating that the changes in prevalence through 1995 were driven by socioeconomic changes. The significant result for 1998, however, suggests that socioeconomic factors cannot fully explain the later change in prevalence.

The logistic regression explained only about 25%* of contraceptive use in Guatemala. While socioeconomic factors clearly influence this practice, other variables not tested in this model intervene in the process.

Determinants of Use Among Mayans

The findings for Mayan women closely parallel the findings for all Guatemalan women (Table 6). Once again, secondary education produced the largest effect; Mayan women with a secondary education were 5.8 times as likely to use some contraceptive method as those with no schooling. Women who spoke Spanish were twice as likely to use contraceptives as those who spoke only a Mayan language. After we controlled for this general effect of Mayan women's ability to speak Spanish, Mayans who spoke Spanish at home were no more likely to use contraceptives than were their K'iche'-speaking counterparts (p=0.24), probably because their more "modern" behavior was captured by other socioeconomic variables. Finally, when socioeconomic factors and the ability to speak Spanish were taken into account, women who spoke Q'eqchi' and Mam were, respectively, 3.3 and 1.9 times as likely to use contraceptives as were speakers of K'iche'.

These findings yield a mixed message regarding differences by linguistic subgroup. Q'eqchi'- and Mam-speakers were more likely to practice contraception (7% of each) than were women from most other Mayan groups. While the difference is significant in statistical terms, the prevalence is still very low by international standards and thus has relatively little programmatic importance (one would not label any of these groups "innovators" in terms of family planning). In past surveys, data from Mayan respondents in different linguistic groups were combined under the single heading "Mayans," because samples were not large enough to allow further breakdowns. One wondered if this practice of combining the groups into a single category obscured differences among them. However, the data from this analysis suggest that the groups differ relatively little with respect to contraceptive use, thus justifying the convention of combining them.

The Role of Access

The last part of this analysis tested determinants of contraceptive use, taking access into account, in the four departments with available data from the 1995–1996 DHS. The hypothesis underlying this part of the analysis is that women with greater access to family planning services are more likely than those with less access to use contraceptives, when the socioeconomic factors known to influence contraceptive use are controlled for. In these four departments, women of reproductive age lived an average of 4.1 km or 34.4 minutes from a facility that provided some type of

Table 5. Odds ratios (and standard errors) from logistic regression analysis indicating the effects of socioeconomic characteristics on the likelihood of use of any contraceptive, all women, 1978–1998

Characteristic	Odds ratio (N=17,482)
Mayan	0.19 (0.075)**
Age	1.04 (0.004)**
Works outside home	1.42 (0.115)**
Owns radio	1.20 (0.112)*
Owns television	2.43 (0.224)**
Primary education	1.55 (0.128)**
Secondary education	2.54 (0.317)**
University education	3.23 (0.686)**
Guatemala City	1.70 (0.155)**
Escuintla	1.29 (0.126)**
Quetzaltenango	1.42 (0.187)**
1987	1.15 (0.126)
1995	1.07 (0.118)
1998	1.42 (0.175)**
Interactions	
Mayan x age	1.00 (0.008)
Mayan x works	1.08 (0.173)
Mayan x radio	1.25 (0.264)
Mayan x television	1.38 (0.250)
Mayan x primary ed.	1.07 (0.176)
Mayan x secondary ed.	2.51 (0.819)**
Mayan x university ed.	2.38 (1.968)
Mayan x 1987	0.97 (0.264)
Mayan x 1995	1.05 (0.271)
Mayan x 1998	1.04 (0.292)
Log likelihood	*–8,365.2*

*p<.05. **p<.01. *Note:* Based on 15–49-year-old women in union.

*This measure is sometimes referred to as the pseudo-R^2. It indicates the improvement in the log-likelihood due to the independent variables.

Table 6. Odds ratios (and standard errors) from logistic regression analysis indicating the effects of socioeconomic characteristics on the likelihood of use of any contraceptive, Mayan women, 1995–1996

Characteristic	Odds ratio (N=3,075)
Age	1.04 (0.009)**
Works outside home	1.80 (0.318)**
Owns radio	1.37 (0.315)
Owns television	1.70 (0.360)*
Primary education	1.76 (0.341)**
Secondary education	5.76 (2.296)**
Speaks Spanish	2.03 (0.443)**
Lives in urban area	2.36 (0.456)**
Linguistic group†	
Spanish	1.30 (0.316)
Kaqchikel	1.00 (0.287)
Q'eqchi'	3.34 (0.883)**
Mam	1.91 (0.545)*
Poqomochi'	0.47 (0.487)
Other	0.94 (0.561)
Log likelihood	*–603.9*

*p<.05. **p<.01. †Reference group is K'iche'. *Note:* Based on 15–49-year-old women in union.

modern contraception. There was no difference in distance by ethnic group: 4.2 km for Mayans, compared with 3.8 km for ladinos. The average time to a facility was 33.6 minutes for Mayans and 35.8 minutes for ladinos.*

Findings from this analysis (Table 7) were similar to those for the overall population. Mayans were considerably less likely to use contraceptives than were ladinos (odds ratio, 0.03), and socioeconomic factors—particularly having a secondary education—had a large positive impact upon contraceptive use.

This model also included two dummy variables to measure access. The first identified all women living within 10 minutes of a facility offering family planning services, and the second, which tested whether access had a different effect for Mayan than ladino women, was an interaction between the first dummy and the indicator of Mayan ethnicity. With this model, travel time had a positive and significant impact for Mayans; Mayan women within 10 minutes of a family planning facility were 2.3 times as likely to use contraceptives as Mayans who must travel more than 10 minutes. In contrast, access had no influence on contraceptive use among ladinos. This measure of access may be a proxy for cultural isolation. However, in this multivariate model, one would expect cultural isolation to be partially captured by education, work outside the home, and radio or television ownership.

We conducted several simulations to determine the implications of these findings (data not shown). As a reference point, 4% of Mayan women in union in these departments used a modern contraceptive method as of 1995–1996. If every Mayan woman lived within 10 minutes of a family planning facility, prevalence in this group would increase to 6% (assuming everything else remained constant).

Conclusions

The findings from this analysis indicate that Mayan contraceptive use has increased, but very slowly, over the past 20 years: from 4% in 1978 to 13% in 1998. Little progress has been made in rural areas, where only 6% of Mayan women, married or in union, used contraceptives as of 1998, and even fewer (5%) used a modern contraceptive. In contrast, use among ladinos in 1998 reached 50%.

Among those using contraceptives, the ethnic groups are quite similar in terms of method mix. With a few exceptions (e.g., the slightly higher reliance on female sterilization among Mayan than ladino users in 1987, or the slightly higher use of injectables among Mayans than ladinos in 1998), shifts in method preference have been similar for the two groups over time. This finding most likely reflects the availability of methods to Guatemalan women at different times over this 20-year period, regardless of ethnic group. If provider bias has been a factor in method selection, it seems to have operated similarly for Mayans and ladinos.

To the extent that differences in method mix exist between the two groups, they appear to reflect the particular circumstances of the groups. The drop in the relative popularity of female sterilization among Mayans as of 1995 could indicate that service delivery providers have changed their strategy to offer a fuller range of methods, placing less emphasis on long-term methods. Changes in APROFAM's pricing for all methods, including sterilization (in an attempt to become financially self-sufficient), may also have prompted some Mayans to opt for other methods.

The data suggest that some have instead resorted to the injectable, which became increasingly available during the 1990s (and more widely acceptable worldwide following its approval in the United States). The injectable offers several advantages that may appeal particularly to women living far from a service facility, of scarce economic means, whose husbands may not know they are using a method and whose difficult lives make daily pill-taking inconvenient. Finally, the greater use of rhythm among Mayans than ladinos most likely reflects barriers (distance, linguistic, cultural, financial, etc.) to using family planning services, as well as a preference for a "natural" method to space births.

Table 7. Odds ratios (and standard errors) from logistic regression analysis indicating the effects of access to services and socioeconomic characteristics on the likelihood of use of a modern contraceptive among all women, four departments, 1995–1996

Characteristic	Odds ratio (N=1,979)
Live within 10 min. of services	
All women	0.86 (0.186)
Mayan women	2.30 (0.840)*
Mayan	0.03 (0.028)**
Age	1.04 (0.010)**
Works outside home	1.28 (0.239)
Owns radio	0.76 (0.204)
Owns television	2.26 (0.509)**
Primary education	1.36 (0.319)
Secondary education	2.09 (0.680)*
Lives in urban area	1.47 (0.287)*
Interactions	
Mayan x age	1.02 (0.018)
Mayan x work	1.05 (0.387)
Mayan x radio	1.48 (0.836)
Mayan x television	1.23 (0.509)
Mayan x primary ed.	1.09 (0.474)
Mayan x secondary ed.	4.84 (3.078)*
Log likelihood	*–583.1*

*p<.05. **p<.01. *Note:* Based on 15–49-year-old women in union.

It is also noteworthy that the source of contraception has been quite similar for the two groups over time. The proportion of all users obtaining methods from APROFAM increased markedly between 1978 (14%) and 1998 (38%); the proportions of Mayan and ladino users obtaining their methods from APROFAM have been generally similar since 1987. At each point, Mayan users were more likely than their ladino counterparts to seek services from the Ministry of Health, reflecting the free or low-cost services available from this source. By contrast, Mayan users were less likely than ladino users to obtain methods from a pharmacy, again reflecting more isolated residence in rural areas, lack of disposable income for purchasing commodities at a pharmacy and less use of condoms. On balance, the small differences noted directly above are perhaps less noteworthy than the overall similarities.

Several programmatic conclusions emerge from this analysis. First, continuing investment in improving social conditions for Mayans will have secondary payoffs in terms of contraceptive use. In this

*The seemingly inconsistent results for travel time and distance (Mayans have farther to travel but take less time for the trip) stem from missing observations on distance.

analysis, the effects of secondary education and radio ownership were even stronger among Mayans than among ladinos. Levels of education have improved notably in the past 20 years (the proportion of adult Mayan women with no schooling dropped from 87% to 59%). Yet there is still room for vast improvement: Only 2% of Mayan women had gone beyond primary school as of 1998. Although investment in education goes beyond the scope of family planning programs, ongoing efforts in this area in Guatemala will continue to favor family planning programs.

Second, this analysis provides the first concrete evidence of the effects of access on contraceptive use among the Mayans. Despite the strong influence of socioeconomic factors on contraceptive use (in Guatemala and elsewhere), access emerges as a significant correlate of contraceptive use for Mayans in the four departments with available data. The programmatic implications of this finding are that the local implementing organizations and international donors are well advised to continue initiatives that attempt to increase access to quality services for Mayans provided in a culturally appropriate manner.

Third, this analysis raises questions about future investment in family planning for Mayan versus ladino populations. Because of the vast differences in acceptance of family planning over past years among the two groups and the shrinking funds available for population programs, international agencies have maintained a strong funding base in support of Mayan programs. Their rationale is one of fragile demand among Mayans and the inability of Mayans to pay for services. Our findings support this position. However, we should not lose sight of the fact that contraceptive prevalence among ladinos is still quite low by Central American standards, and continued investment in programs that reach this group will be essential to increase prevalence in the country as a whole.

Has family planning service delivery failed the Mayans, or are the Mayans simply not interested even if services are put at their doorstep? Evidence mounts that access is a factor and that programs need to strengthen their efforts to provide better access to high-quality services. Results of an operations research project in El Quiché in 1992–1996 suggest that it is possible to significantly increase knowledge, favorable attitudes and contraceptive use by increasing access to services tailored to the needs of Mayan communities.[11] In that pilot project, prevalence rose from 5% to 18%, one of the highest levels for any setting outside the two largest cities in Guatemala.

Data from our analyses provide further evidence that access has a favorable effect on use among the Mayans. The Population Council in Guatemala has organized a network of nongovernmental organizations working in Mayan communities, which will further increase access to culturally appropriate services.[12] In short, the Mayans remain a "hard-to-reach" audience, but evidence continues to accumulate that changes in the adoption of family planning occur among this diverse ethnic group when services are provided in a culturally acceptable manner.

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Resumen

Contexto: *Guatemala se encuentra mucho más atrasada que los demás países centroamericanos con respecto a la prevalencia del uso de anticonceptivos, y hay una marcada diferencia en la práctica anticonceptiva entre los dos grupos étnicos principales—los mayas y los ladinos. Un mejor conocimiento de los factores que afectan esta práctica es esencial para los esfuerzos que fomenten el incremento de la prevalencia de anticonceptivos.*

Métodos: *Se utilizaron los datos correspondientes a cuatro encuestas nacionales para examinar las tendencias del uso anticonceptivo durante el período 1978–1998. Los resultados de los análisis multivariados indican el alcance que varios factores, particularmente el origen étnico y el acceso a los servicios, tienen para influir en la dinámica de la anticoncepción.*

Resultados: *Desde 1978 a 1998, el porcentaje de mujeres que usaban algún método aumentó del 28% al 50% entre los ladinos, y del 4% al 13% entre la población maya. Los métodos más ampliamente utilizados fueron la esterilización femenina, el ritmo y la píldora, aunque en 1998, los inyectables reemplazaron el uso de la píldora, convirtiéndose en el tercer método anticonceptivo más popular entre los mayas. La fuente de los métodos ha ido cambiando a través del tiempo, aunque cada encuesta reveló que los mayas y ladinos recurrían a fuentes similares. Los cambios dramáticos ocurridos en las condiciones socioeconómicas de los ladinos y los mayas durante este período de 20 años, fue un factor determinante con respecto al uso de anticonceptivos; el acceso a los servicios también presenta una significativa correlación con el nivel de uso entre los mayas, una vez que se controlan los factores socioeconómicos.*

Conclusiones: *La población maya es de "difícil acceso"; sin embargo, este grupo está cada vez más proclive a adoptar los servicios de planificación familiar, cuando éstos son accesibles y se presentan en una forma que resulta culturalmente aceptable.*

Résumé

Contexte: *Le Guatemala se classe loin derrière les autres pays d'Amérique Centrale en termes de prévalence contraceptive, et les niveaux de la pratique contraceptive diffèrent largement entre ses deux groupes ethniques principaux, les Mayas et les ladinos. La compréhension des*

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facteurs d'influence de la pratique contraceptive est essentielle aux efforts des programmes d'accroissement de la prévalence.
Méthodes: *Les données de quatre enquêtes nationales ont servi à l'examen des tendances de la pratique contraceptive entre 1978 et 1998. Les résultats des analyses multivariées révèlent la mesure de l'influence de différents facteurs (origine ethnique et accessibilité, surtout) sur la dynamique contraceptive.*
Résultats: *Entre 1978 et 1998, la proportion des femmes pratiquant une forme quelconque de contraception est passée de 28% à 50% parmi les ladinos, mais de 4% à 13% seulement chez les Mayas. La stérilisation féminine, la pilule et l'abstinence périodique sont les méthodes les plus répandues, bien que les injectables aient remplacé la pilule, en troisième position, chez les Mayas, depuis 1998. Bien qu'ayant changé au fil du temps, les sources des méthodes restent similaires, à chaque enquête, entre les Mayas et les ladinos. Dans les deux groupes, l'évolution radicale des conditions socioéconomiques, ces 20 dernières années, s'est révélée un facteur clé de la pratique contraceptive. L'accessibilité des prestations joue également un rôle significatif chez les Mayas, après contrôle des facteurs socioéconomiques.*
Conclusions: *Bien que «difficiles d'accès», les Mayas se montrent plus disposés à adopter le planning familial lorsque les prestations sont accessibles et proposées sous une forme culturellement acceptable.*