Contraceptive Dynamics among the Mayan Population of Guatemala: 1978-1998

Jane T. Bertrand,
Eric Seiber and Gabriela Escudero

June 2000

MEASURE Evaluation

Carolina Population Center
University of North Carolina
at Chapel Hill
123 W. Franklin Street
Suite 304
Chapel Hill, NC 27516
Phone: 919-966-7482
Fax: 919-966-2391
measure@unc.edu
www.cpc.unc.edu/measure

Collaborating Partners:

Macro International Inc.
11785 Beltsville Drive
Suite 300
Calverton, MD 20705-3119
Phone: 301-572-0200
Fax: 301-572-0999
measure@macroint.com

John Snow Research and Training Institute
1616 N. Ft. Myer Drive
11th Floor
Arlington, VA 22209
Phone: 703-528-7474
Fax: 703-528-7480
measure_project@jsi.com

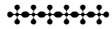
Tulane University
1440 Canal Street
Suite 2200
New Orleans, LA 70112
Phone: 504-584-3655
Fax: 504-584-3653
measure2@tulane.edu

Funding Agency:

Center for Population, Health
and Nutrition
U.S. Agency for
International Development
Washington, DC 20523-3600
Phone: 202-712-4959

WP-00-24

The research upon which this paper is based was sponsored by the MEASURE *Evaluation* Project with support from the United States Agency for International Development (USAID) under Contract No. HRN-A-00-97-00018-00.



The working paper series is made possible by support from USAID under the terms of Cooperative Agreement HRN-A-00-97-00018-00. The opinions expressed are those of the authors, and do not necessarily reflect the views of USAID.

The working papers in this series are produced by the MEASURE *Evaluation* Project in order to speed the dissemination of information from research studies. Most working papers currently are under review or are awaiting journal publication at a later date. Reprints of published papers are substituted for preliminary versions as they become available. The working papers are distributed as received from the authors. Adjustments are made to a standard format with no further editing.

A listing and copies of working papers published to date may be obtained from the MEASURE *Evaluation* Project at the address listed on the back cover.

Other MEASURE *Evaluation* Working Papers

WP-00-23 Skewed Method Mix: a Measure of Quality in Family Planning Programs (Jane T. Bertrand, Janet Rice, Tara M. Sullivan & James Shelton)

WP-00-22 The Stymied Contraceptive Revolution in Guatemala (Roberto Santiso G. and Jane T. Bertrand)

WP-00-21 The Impact of Health Facilities on Child Health (Eric R. Jensen and John F. Stewart)

WP-00-20 Effort Indices for National Family Planning Programs, 1999 Cycle (John Ross and John Stover)

WP-00-19 Evaluating Malaria Interventions in Africa: A Review and Assessment of Recent Research (Thom Eisele, Kate Macintyre, Erin Eckert, John Beier, Gerard Killeen

WP-00-18: Monitoring the AIDS epidemic using HIV prevalence data among young women attending antenatal clinics: prospects and problems (Basia Zaba, Ties Boerma and Richard White)

WP-99-17: Framework for the Evaluation of National AIDS Programmes (Ties Boerma, Elizabeth Pisani, Bernhard Schwartländer, Thierry Mertens)

WP-99-16: National trends in AIDS knowledge and sexual behaviour in Zambia 1996-98 (Charles Banda, Shelah S. Bloom, Gloria Songolo, Samantha Mulendema, Amy E. Cunningham, J. Ties Boerma)

WP-99-15: The Determinants of Contraceptive Discontinuation in Northern India: A Multilevel Analysis of Calendar Data (Fengyu Zhang, Amy O. Tsui, C. M. Suchindran)

WP-99-14: Does Contraceptive Discontinuation Matter?: Quality of Care and Fertility Consequences (Ann Blanc, Siân Curtis, Trevor Croft)

WP-99-13: Socioeconomic Status and Class in Studies of Fertility and Health in Developing Countries (Kenneth A. Bollen, Jennifer L. Glanville, Guy Stecklov)

WP-99-12: Monitoring and Evaluation Indicators Reported by Cooperating Agencies in the Family Planning Services and Communication, Management and Training Divisions of the USAID Office of Population (Catherine Elkins)

WP-98-11: Household Health Expenditures in Morocco: Implications for Health Care Reform (David R. Hotchkiss, Zine Eddine el Idriss, Jilali Hazim, and Amparo Gordillo)

WP-98-10: Report of a Technical Meeting on the Use of Lot Quality Assurance Sampling (LQAS) in Polio Eradication Programs

WP-98-09: How Well Do Perceptions of Family Planning Service Quality Correspond to Objective Measures? Evidence from Tanzania (Ilene S. Speizer)

WP-98-08: Family Planning Program Effects on Contraceptive Use in Morocco, 1992-1995 (David R. Hotchkiss)

WP-98-07: Do Family Planning Service Providers in Tanzania Unnecessarily Restrict Access to Contraceptive Methods? (Ilene S. Speizer)

WP-98-06: Contraceptive Intentions and Subsequent Use: Family Planning Program Effects in Morocco (Robert J. Magnani)

WP-98-05: Estimating the Health Impact of Industry Infant Food Marketing Practices in the Philippines (John F. Stewart)

WP-98-03: Testing Indicators for Use in Monitoring Interventions to Improve Women's Nutritional Status (Linda Adair)

WP-98-02: Obstacles to Quality of Care in Family Planning and Reproductive Health Services in Tanzania (Lisa Richey)

WP-98-01: Family Planning, Maternal/Child Health, and Sexually-Transmitted Diseases in Tanzania: Multivariate Results using Data from the 1996 Demographic and Health Survey and Service Availability Survey (Jason Dietrich)

ABSTRACT

CONTRACEPTIVE DYNAMICS AMONG THE MAYAN POPULATION OF GUATEMALA: 1978-1998

Guatemala lags far behind its neighboring countries in Central America in contraceptive prevalence. This paper traces the marked differences in family planning between the two main ethnic groups—the Mayans and *ladinos*—over a 20-year period, based on four national level surveys. Whereas prevalence (all methods) among *ladinos* increased from 27 percent in 1978 to 50 percent in 1998, the level among Mayans increased from 4 to only 13 percent. Female sterilization, the pill and rhythm have been the most widely used methods, although as of 1998 Depoprovera 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.

Three separate multivariate analyses were used to test the determinants of contraceptive use: among all women of reproductive age over this 20-year period, among Mayan women only in 1995/96 (to examine inter-group differences), and among all women in four *departamentos* in which it was possible to incorporate access to services in the model. The dramatic changes in socio-economic conditions among both *ladinos* and Mayans over these 20 years were key determinants of contraceptive use, although as of 1998 there was evidence of other factors as well (conceivably the effect of the program). After controlling for socio-demographic factors, access to services emerged as a significant correlate of contraceptive use among Mayans. The authors discuss the programmatic implications of these findings.

CONTRACEPTIVE DYNAMICS AMONG THE MAYAN POPULATION OF GUATEMALA: 1978-1998

I. Background

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, yet 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 of 38 percent (all methods) lags far behind that of neighboring countries in Central America, with rates ranging from 47 to 75 percent (PRB, 1999).

The population of Guatemala of 12.3 million is divided roughly in half between the Spanish speaking and economically dominant *ladinos* and the less affluent, more rural Mayan (indigenous) populations. The latter consists of some 22 major groups who remain linguistically and culturally isolated from *ladino* society as well as 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 of Mayans and in turn their distrust of the *ladino* population (Enge and Martinez-Enge, 1993). 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 1980's, whole villages were massacred and many Mayans were forced to leave the country, further reinforcing distrust of outsiders among the Mayans. In the eyes of many Mayans, the promotion of family planning (interpreted as not having children) reflects similar genocidal motives (Santiso and Bertrand, 2000).

This article provides an in-depth analysis of contraceptive dynamics among Mayans and *ladinos* over a 20 year period: 1978 – 1998. It goes beyond previously published work in four ways. First, it examines trends on key contraceptive practices (use, method mix, and source) and how these patterns differ by ethnic group. Second, it examines the extent to which contraceptive practice varies **among** different Mayan groups. Third, it constitutes the first attempt to measure the effect of access to service on contraceptive use in Guatemala, based on the linking of data from individual questionnaires and a facility-based survey in four *departamentos*.[1] 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.

[1] A *departamento* is an administrative division similar to a state.

II. Methodology

Five national-scale representative surveys of women of reproductive age[2] in Guatemala were available for analysis (APROFAM and CDC, 1978; APROFAM and CDC, 1983; Ministerio de Salud Pública y Asistencia Social [MASPS] et al., 1987; MASPS et al., 1996; and INCAP et al., 1996). Of the five, two were conducted with technical assistance from the Centers for Disease Control (in 1978 and 1983) and three were conducted in collaboration with MACRO International (1987, 1995/96, and a mini-DHS in 1998). Because of certain technical problems with the 1983 data set, this article is based on the 1978, 1987, 1995/96, and 1998 data. The 1995/96 study included (a) an over-sampling of four *departamentos*, of which two were predominantly Mayan, and (b) a facility-based survey in these same *departamentos* in 1997. Of the five surveys, only the 1996 DHS (with an over-sampling of four *departamentos* in 1996) provides reliable estimates of inter-group differences among different Mayan linguistic groups. Table 1 provides the number of cases available for each analysis.

Estimates of the percent Mayan in the Guatemalan population range from 40-60 percent, although the exact number remains elusive for two reasons. First, ethnic identity is defined along cultural dimensions rather than strict, measurable criteria. According to Cabarrus (1979), ethnicity in Guatemala is based on race, language, and history. 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 different censuses and surveys. Different approaches to classifying respondents have included (1) hiring interviewers from the local area who "know"

[2] The 1978 and 1987 surveys were limited to women 15-44. The multivariate results presented below proved robust when respondents 45-49 were excluded to achieve age comparability.

the ethnicity of respondents (1964 census), (2) operationally defining Mayans as those who use native dress or speak a Mayan dialect at home (Bertrand et al., 1999), (3) relying on observation alone (the primary method in recent DHS surveys), and (4) using self-report of the respondent. Haeussler (1992) points out that the 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 to reveal their identity.

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 the use of contraception among *ladinos* and Mayans, and to identify changes in these determinants over time. Demand factors include a series of socio-demographic variables (age, employment outside the home, education, urban/rural residence, ownership of radio and television), [3] 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 1995/96. For access, the preferred methodology is to link data from a household survey to data from a facility-based survey in the same geographical area. Such data were available for only one of the five nationally representative surveys conducted to date (the 1995/96 DHS) and even then for only four of the 22 *departamentos* in Guatemala. 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.

[3] The 1978 survey did not collect a number of socio-demographic variables that appeared in the later DHS surveys, making it impossible to include them in a model that looked at change over the 20 year period.

In sum, with the available data we were able to perform three separate analyses on:

a. The determinants of contraceptive use (excluding access) among Guatemalan women over the past 20 years
b. Factors that influence contraceptive use among Mayans only (1995/96)
c. The role of access on contraceptive prevalence in four *departamentos* (based on the 1995/96 DHS and 1997 facility-based survey)

We used a weighted logit approach for all three of these analyses. Contraceptive use was defined as 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 explaining contraceptive use.

For analysis (a), above, we pooled and weighted each observation for women in union, aged 15-49, from the 1978, 1987, 1995, and 1998 surveys, for a total of 17,482 cases. Ethnicity was entered as a dummy variable (0,1) to capture unexplained differences in contraceptive use between Mayans and *ladinos*. Interaction terms (between the ethnicity variable 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 three 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 the effects of the family planning (FP) program not explicitly measured in this model.

For analysis (b) on factors influencing contraceptive use among Mayans only (1995/96), 3,075 cases were available for analysis (Mayan women, age 15-49, married or in union). The explanatory variables were the same as described directly above. However, several changes were needed. Since the study was done in a single time period, we dropped the variable "year." A new dummy variable for urban residence replaced the dummy variables for specific cities from analysis (a). Also, ability to speak Spanish was included as a dummy variable. To test for differences in prevalence among the different Mayan subgroups, we created additional dummy variables for the language spoken at home (Spanish, Cachiquel, Kekchi, Mam, Pocomchi, other). Since the Quiché are the largest linguistic group and have one of the lowest contraceptive prevalence rates, we chose them as the reference category.

Regarding analysis (c), the 1997 Provider Census Supplement (or "the Provider Survey") provides the first opportunity to systematically study the role of access on contraceptive use in Guatemala, at least in the four highland *departamentos* in which it was carried out: Solola, Totonicapan, Quetzaltenango, and San Marcos (INCAP et al., 1999a). Although the results can not be generalized to all of Guatemala, they are nonetheless of considerable interest since they allow for comparisons among the two major ethnic groups with regard to access and its effect on contraceptive use. Mayans (15-49 years) constituted 62.7 percent of the total population in these four *departamentos* (or 91.4 percent, 95.7 percent, 32.0 percent and 37.5 percent respectively of the four *departamentos* cited directly above).

Analysis (c) on the role of access in contraceptive use used a variant of the logit model described for analysis (a). Dummy variables for year and for the three largest cities were dropped, though "urban" as a place of residence was added. As in analysis (a), interaction terms—between ethnicity and the remaining explanatory variables—were entered to test the hypothesis that socio-economic factors or access to services have a different effect on contraceptive use among Mayans and *ladinos.* Access to FP services was measured in terms of travel time and entered into the model as a dummy variable.[4] The mean 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 to 49, we had 1,979 cases for analysis in the full model. In this analysis, we examined two different levels of access: living within 10 minutes of a facility and living within five minutes of a facility.

III. Results

A. Socio-demographic Characteristics

Table 2 shows marked differences between the Mayan and *ladino* women on selected socio-demographic variables. The mean age of respondents over the four surveys ranged from 30-32 years over both ethnic groups. *Ladino* women were more likely than Mayans to work outside the home. Although the *ladinos* were consistently higher than Mayans on all socio-economic indicators at each survey, both groups showed marked improvements on key variables over the 20 year period. Among the Mayans, the percentage of Mayan women with a primary education increased over threefold, from 12 to 39 percent. The percentage of Mayans reporting television

[4] Since many community respondents knew the time necessary to travel to a particular facility, but not the actual distance, we chose to use travel time rather than distance as our access measure.

ownership (a proxy for economic status) shot up from only 2 percent in 1978 to 30 percent in 1998. *Ladino* women showed similar gains in education and T.V. ownership.

B. Contraceptive Prevalence

The data shown in Figure 1 document the stark contrasts in contraceptive use between *ladinos* and Mayans in Guatemala. Whereas contraceptive prevalence (all methods) among *ladinos* has steadily increased from 27 percent in 1978 to 34 percent in 1987 to its current level of 50 percent in 1998, the change among the Mayan population has been very small; from 4 percent in 1978 to 6 percent in 1987 to 13 percent in 1998. Despite the presence of family planning services in Guatemala for over 30 years, the current levels of contraceptive prevalence among Mayans more closely resemble those of Africa than Latin America.

C. Method Mix

Method mix refers to percentage of contraceptive users that have opted for each different method. As shown in Table 3, contraceptive method preference has shifted slightly over time, but choice of methods (among those who practice family planning) has been surprisingly similar among Mayans and *ladinos* at each survey.

Over the past 20 years, three methods have predominated: female sterilization, the pill and rhythm. Female sterilization has been the leading method for both Mayan and *ladino* users on every survey to date. As of 1987, fully half of Mayans using contraception (51 percent) had opted for female sterilization, a percentage slightly higher than that for *ladino* users (44 percent). The pill and rhythm use represented 12-18 percent of use.

Whereas method preference was quite similar among users in the two ethnic groups between 1978-95, in the most recent DHS (1998) the patterns of method mix begin to diverge. Female sterilization remains number one; however, the percent of users relying on this method is lower among Mayans (33 percent) than *ladinos* (45 percent). For Mayan users rhythm is almost as widespread (28 percent) as female sterilization. Of note, Depo has risen to be the third most widely used method among Mayans (representing 14 percent among users), with the pill dropping to fourth place (at 12 percent). Among *ladino* users, by contrast, female sterilization is far more prevalent now (45 percent of users) than either the pill or rhythm (both at 13 percent of users), with Depo in fourth place at 10 percent of *ladino* users. Condoms remain relatively under-utilized in this population (never reaching more than 7 percent among Mayan or *ladino* users in any of the surveys reported).

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 most recent survey (1998) suggests some divergence in method preference, discussed in more detail in the final section.

D. Source of Method

Data on source of method by ethnic group and year of survey reveal several contrasts between the two groups, as well as certain similarities (see Table 4). For the population as a whole (Mayans and *ladinos* combined), there has been a marked shift over the past 20 years in source of contraception, with the percent reporting to use APROFAM increasing from 14 percent in 1978 to 37 percent in 1987 and to 42 percent in 1995. As of 1998, the percent of users obtaining

their method from APROFAM services increased to 49 percent. Over this same 20-year period, use of Ministry of Health services has dropped off notably from 44 percent in 1978 to 22 percent in 1987 to 17 percent in 1995 and 21 percent in 1998. Use of private facilities (primarily doctors' offices) has remained quite constant for the population as a whole, varying from 13 percent to 19 percent over the four surveys. Similarly the contribution of the Guatemala Social Security (IGSS) has remained at a relatively low and steady level, ranging from 7 percent to 14 percent for all users. Pharmacies have been the source of contraception for relatively few users, ranging from 1 percent to 16 percent over the past twenty years. This result is consistent with the high use of female sterilization, which is not available through a pharmacy. Finally, health workers have provided a very minimal amount of the contraception used by the women in these surveys, ranging from 1 percent to 4 percent on the different surveys.

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 percentages of use by source should be interpreted with caution. Among those women using contraception in 1978, *ladinos* were more likely than Mayans to use the services of APROFAM for supply, although this difference narrowed over time. On each survey, the few Mayans using contraception were more likely than *ladinos* to report the Ministry of Health, and they were less likely to mention the pharmacy as a source of contraception. However, the data do indicate that APROFAM is the major service provider for both *ladino* and Mayan users and that this has remained the case since the mid 1980's. The role of the Ministry of Health in delivering family planning services has dropped off; in the past 15 years it has supplied less than one in five contraceptive users.

E. Linguistic Sub-Groups of Mayans

The sample sizes in the 1978, 1983, 1987, and 1998 surveys were sufficiently large to obtain estimates of prevalence for the Mayans compared to the *ladinos,* but not for different subgroups of Mayans. The first (and to date only) data set to allow such comparisons is the 1995/96 survey. The sampling in 1995/96 for the national survey combined with oversampling in four *departamentos* yielded data representative at the departmental level for nine *departamentos,* seven of which were predominantly Mayan. This sampling strategy yielded five different Mayan linguistic groups with at least 350 respondents each. In short, the 1996/96 survey provided the first opportunity to date to more fully understand differences in contraceptive use among Mayans by *departamento* and by language group.

Table 5 shows current contraceptive use (all methods and modern methods) among Mayans by *departamento.* The results reflect marked differences between levels of use in the two major urban areas (Guatemala City, 18 percent; Quetzaltenango, 22 percent) in comparison to the remaining *departamentos* (none exceeding 9 percent).

This disparity is seen even more vividly in the percent of Mayans in urban and rural areas using contraception: 22 percent versus 6 percent, respectively. If one limits the analysis to <u>modern</u> methods only, the urban/rural disparity among Mayans remains, but the percentages decrease to 17 percent (urban) and 4 percent (rural).

Mayans from a particular linguistic group tend to live in contiguous areas; however, these areas may span two or more *departamentos*. Table 5 also shows the percentage of Mayan women,

married or in union, using any method or using a modern contraceptive method as of 1995/96, by linguistic group.[5] Although potentially more useful than the analysis by *departamento,* this analysis by linguistic group is clouded by the substantial number of Mayans from different linguistic groups living in Guatemala City. The last panel in Table 5 shows the percentage of Mayans using any method or using a modern method, excluding those living in either Guatemala City or Quetzaltenango. The levels of use (any method) range from 1 to 14 percent for the different groups. The percent using a modern method is slightly lower, ranging from 1 to 10 percent for the different groups.

F. Determinants of Contraceptive Use

1. All Women: 1978-98

What determines contraceptive use in Guatemala? Part (a) of the analysis tested seven sociodemographic variables (ethnic group, age, works outside the home, radio ownership, T.V. ownership, education, residence in a city) as potential factors influencing contraceptive use in the Guatemalan population. All seven socio-demographic factors were significant. Use was higher among respondents who were *ladino*, older, employed outside the home, owned radio/television, had more education, and resided in a city (Table 6).

The changes in prevalence through 1995 were driven by changes in socio-demographic factors. Had there been a large, independent effect of the family planning program (which could not be tested directly in this part of the analysis for lack of measure of the supply environment), then it should have been manifest through the dummy variable for "year," suggesting that factors other than socio-demographic characteristics were influencing this change. However, the odds ratios

[5] Linguistic group is operationally defined as language spoken at home.

for the dummy variables for "year" (1987, 1995) were not significantly different from one. After controlling for age, employment outside the home, radio/television ownership, and education, a Guatemalan woman in 1995 was no more likely to use contraceptives than her counterpart in 1978. However, the dummy variable for 1998 was significant, suggesting the possible effects of the program in addition to socio-demographic factors. The logit model presented in Table 6 explained only about 25 percent[6] of the variance in change over time in the use of contraception. While the socio-economic factors clearly influence this practice, other variables not tested in this model intervene in the process.

2. Mayan Women Only (1995/96)

Table 7 presents data on the determinants of contraceptive use among Mayan women, in the form of odds ratios from the logit model. The results closely parallel our findings for all Guatemalan women. Once again, secondary education produced the largest effect; Mayan women with secondary education were 5.8 times as likely to use some contraceptive method than those with no schooling (p=0.00). Women who could speak Spanish were twice as likely to use contraceptives as those who only spoke a Mayan language (p=0.01). After controlling for this general effect of the ability to speak Spanish across all Mayan women, Mayans who spoke Spanish at home were no more likely to use contraceptives than their Quiché-speaking counterparts (p=0.24). Finally, after controlling for age, employment status, radio and television ownership, education, urban residence, and the ability to speak Spanish, two linguistic groups emerged as significant: Kekchí and Mam women proved 3.3 and 1.9 times more likely to use contraception than the Quiché (p=0.00 and p=0.01).

[6] This 25% is sometimes referred to as a pseudo-$R^{2.}$ It measures the improvement in the log-likelihood due to the independent variables.

These findings yield a mixed message regarding differences by linguistic subgroup. Statistically, the Kekchi and Mam speakers were more likely to use contraception than women from other groups, but the differences are not particularly meaningful in programmatic terms. This finding suggests that the convention of combining all Mayans into a single category (without distinction by subgroup) is justified in the case of contraceptive use.

3. Role of Access

Part (c) of this analysis tested determinants of contraceptive use, taking access into account, in the four *departamentos* with available data from the 1995/96 DHS. The hypothesis underlying this part of the analysis is that women with greater access to FP services are more likely to use contraception, controlling for the socio-demographic factors known to influence contraceptive use. In these four *departamentos,* women of reproductive age lived an average of 4.1 kilometers or 34.4 minutes from a facility that provided some type of modern contraception. There was relatively little difference in distance by ethnic group: 4.2 km for Mayans compared to 3.8 km for *ladinos.*[7] The average time to a FP facility was 33.6 minutes for Mayans and 35.8 minutes for *ladinos* (data not shown).[8] The seemingly inconsistent results for travel time and distance (Mayans have farther to travel but take less time on the trip) stem from missing observations on distance; many community informants only knew travel times to a facility and not the distance in kilometers.

This analysis yielded the same findings as analysis (a): that Mayans were considerably less likely to use contraceptives than *ladinos,* and that socio-economic status (including education) had a

[7] Not significantly different, p=0.947.
[8] Not significantly different, p=o.094.

large positive impact upon contraceptive use (Table 8). However, inclusion of the access measure produced an interesting result. For both distances, travel time had a positive and significant impact for Mayans, but had no influence on contraceptive use among *ladinos*. For the first model, Mayan women within ten minutes of a family planning facility were 2.3 times as likely to use contraceptives than Mayans who must travel more than ten minutes (p=0.023). Similarly, in the second model, Mayans within five minutes proved 2.4 times as likely to use contraception (p=0.031) than those living further away (Table 8). No such effect of access was apparent among *ladinos.*

We conducted several simulations to determine the "so-what" implications of these findings (data not shown). As a reference point, 5.3 percent of Mayan women in union in these *departamentos* used a modern contraceptive method as of 1995/96. If every Mayan woman lived within 10 minutes of a FP facility, prevalence in this group would increase from 4.3 percent to 6.4 percent (assuming everything else remained constant). If all Mayan women lived within five minutes, the simulation indicates that 8.5 percent of Mayan women would use a modern contraceptive method.

IV. Conclusions

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

Among those using contraception, the ethnic groups are quite similar in terms of method mix. With a few exceptions (e.g., the slightly higher use of female sterilization among Mayan than *ladino* users as of 1987, or the slightly higher use of Depo among Mayans than *ladinos* as of 1995), shifts in method preference have been similar for the two groups over time. This finding most likely reflects the availability of methods to women of Guatemala at different times over this 20-year period, regardless of ethnic group. If provider bias has been a factor in method selection, it would appear that it has operated similarly for both Mayans and *ladinos*.

To the extent that differences do exist in method mix 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 most likely reflects the changes in the pricing policies of APROFAM, the primary provider of voluntary sterilization. During the 1980's the operation was highly subsidized, whereas in the 1990's the price increased markedly as APROFAM sought greater self-sufficiency through cost recovery, and users absorbed a larger portion of the cost. Given the lower economic status of Mayans, the increased cost may have represented a proportionately greater barrier to them than to their *ladino* counterparts. The data suggest that some have instead resorted to Depo-Provera, which became increasingly available during the 1990's (and more widely acceptable worldwide following FDA approval of this method in United States). Depo 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 contracepting, 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.

It is also noteworthy that the source of contraception has been quite similar for the two groups over time. The percentage of all users obtaining methods from APROFAM increased markedly between 1978 (14 percent) and 1987 (37 percent) and to 1998 (49 percent); and the percentages of Mayan and *ladino* users obtaining their methods from APROFAM have also been quite similar since 1987. At each time point, Mayan users were more likely than their *ladino* counterparts to seek services from the Ministry of Health, reflective of 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 residences in rural areas as well as lack of disposable income for purchasing commodities at a pharmacy. 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 analysis, the effects of secondary education and radio ownership were even stronger among Mayans than *ladinos*. There have been notable improvements in the past twenty years (the percent of adult Mayan women with no schooling dropped from 87 to 59 percent); yet at the same time there is still room for vast improvement; only 2 percent 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 socio-demographic factors on contraceptive use (in Guatemala and elsewhere), access still emerges as a significant correlate of contraceptive use for Mayans in the four *departamentos* with available data. Moreover, living within five kilometers of a facility increases the probability of use as compared to living 10 kilometers from one. 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 facilities among the Mayan population.

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 their inability to pay for services. The findings herein 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 from 1992-96 suggest that it is possible to

significantly increase knowledge, favorable attitudes, and contraceptive use by increasing access to services (Bertrand et al., 1999). In that pilot project, prevalence increased from 5 to 18 percent, one of the highest levels for any setting outside the two largest cities in Guatemala. Data from the current analysis provide further evidence that access has a favorable effect on use among the Mayans. The Population Council/Guatemala has organized a network of NGOs working in Mayan communities, which will further increase access among the populations (Population Council, 1998; Population Council, 1999; Castrillo and Evans, 1998). In short, the Mayans remain a hard-to-reach audience, but evidence continues to accumulate of changes in the acceptance of family planning among this diverse ethnic group.

Table 1. Sample Size for Analyses in this Report

	1978	**1987**	**1995/96**	**1998**
Sample Size	1,918	3,377	8,156	4,045
Total Sample	3,607	5,160	12,403	6,021
Multivariate Analyses:				
All Married Women Of Reproductive Age	1,953	3,377	8,107	4,045
All Married Women Of Reproductive Age (Four departments)	N/A	N/A	5,506	N/A
Mayan Married Women of Reproductive Age (Four departments)	N/A	N/A	3,642	N/A

Table 2. Socio-demographic Characteristics of the Respondents, Women in Union, 15-49

	Percent			
	1978	**1987**	**1995**	**1998**
Age	**Mean**	**Mean**	**Mean**	**Mean**
All	31.2	29.7	31.8	31.5
Ladino	31.7	30.0	32.0	31.6
Mayan	30.4	29.4	31.4	31.2
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
Radio Ownership				
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
Television Ownership				
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
Schooling				
All:				
None	59.0	46.3	34.9	30.9
Primary	33.7	44.6	47.7	49.7
Secondary	6.5	8.1	14.4	17.2
University	0.8	0.9	2.9	2.1
Ladinos				
None	40.2	28.9	20.5	18.0
Primary	48.1	57.0	53.9	54.6
Secondary	10.4	12.5	21.0	24.3
University	1.3	1.5	4.5	3.0
Mayan				
None	87.5	74.6	61.4	58.9
Primary	12.0	24.4	26.3	39.2
Secondary	0.5	0.9	2.1	1.7
University	0.0	0.0	0.2	0.1

Table 3. Method Mix among Contraceptive Users by Year and by Ethnic Group

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

Table 4. Source of Method (among Modern Method Users)

	1978			1987			1995			1998		
	Lad	**Mayan**	**All**	**Lad**	**Mayan**	**All**	**Lad**	**Mayan**	**All**	**Lad**	**Mayan**	**All**
APROFAM	14.7	4.3	13.7	37.0	34.5	36.7	41.7	44.2	42.0	49.0	50.5	49.2
MOH	43.4	52.3	44.2	20.0	36.2	21.5	16.4	24.1	17.1	19.7	29.7	20.6
Private sources	15.3	19.6	15.7	19.3	12.1	18.7	17.8	15.5	17.6	12.9	7.7	12.5
IGSS (Guatemala Social Security Institute)	6.9	6.1	6.8	10.0	6.9	9.7	8.2	6.8	8.1	14.9	1.0	13.7
Pharmacy	16.9	6.1	15.9	7.6	5.2	7.4	12.4	5.6	11.7	1.0	1.4	1.0
Health Worker	0.6	7.8	1.2	3.6	1.7	3.5	1.5	1.9	1.5	1.0	1.6	1.1
Other	2.3	3.9	2.4	2.4	3.4	2.5	2.0	1.9	2.0	1.4	8.2	2.0

Table 5. Contraceptive Use among Mayan women 15-49 (All Methods and Modern Methods) in 1995/96, by Department, Urban/Rural Residence, and Linguistic Group

Departamento[9]	**n**	**% use any contraceptive method**	**% use modern method**
Guatemala City	141	17.7	14.9
Quetzaltenago	155	21.9	16.1
Chimaltenago	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
Huchvetenago	466	5.6	5.2
Quiché	457	5.0	3.9
Totonicapan	488	3.3	2.3
Place of Residence			
Urban	642	21.5	17.2
Rural	3020	6.2	4.4
Linguistic Group			
Spanish	756	19.0	14.6
Kekchí	519	6.7	3.7
Cachiquel	552	4.9	3.0
Mam	395	6.6	5.6
Quiché	906	3.1	2.3
Pocomchi	75	1.3	1.3
Other	338	4.1	3.3
Linguistic (excluding Mayans living in Guatemala City or Quetzaltenago):			
Spanish	602	13.5	9.5
Kekchí	518	6.8	3.7
Cachiquel	484	5.2	3.1
Mam	362	6.6	5.8
Quiché	866	2.1	1.4
Pocomchi	75	1.3	1.3
Other	338	4.1	3.3

[9] Only departments for which estimates are valid at the departmental level are included.

Table 6. Determinants of Contraceptive Use (Any Method)

Women in Union, Ages 15 to 49, 1978-1998;
Results of the Logit Model

	Odds Ratio	**Std. Err.**	
Mayan	0.192	0.075	*
Age	1.036	0.004	*
Works outside home	1.422	0.115	*
Radio ownership	1.204	0.112	**
Television ownership	2.429	0.224	*
Education			
Primary	1.547	0.128	*
Secondary	2.544	0.317	*
University	3.231	0.686	*
Guatemala	1.696	0.155	*
Escuintla	1.286	0.126	*
Quezaltenango	1.421	0.187	*
Year87	1.154	0.126	
Year95	1.071	0.118	
Year98	1.418	0.175	*
Interactions			
Mayan*Age	0.998	0.008	
Mayan*works	1.081	0.173	
Mayan*radio	1.252	0.264	
Mayan*tv	1.376	0.250	
Mayan*prim	1.066	0.176	
Mayan*sec	2.511	0.819	*
Mayan*univ	2.383	1.968	
Mayan*Year87	0.974	0.264	
Mayan*Year95	1.049	0.271	
Mayan*Year98	1.035	0.292	
Log Likelihood	-8365.2		
Number of Obs.	17,482		

*Significant at the 1% confidence level
**Significant at the 5% confidence level

Table 7. Determinants of Contraceptive Usage (Any Method), 1995/96
Mayan Women (only) in Union, Ages 15 to 49;
Results of the Logit Model

	Odds Ratio	**Std. Err.**
Age	1.040	0.009 *
Works	1.800	0.318 *
Radio Ownership	1.367	0.315
Television Ownership	1.699	0.360 **
Education		
Primary	1.762	0.341 *
Secondary	5.756	2.296 *
Speaks Spanish	2.034	0.443 *
Urban Residence	2.361	0.456 *
Linguistic Group		
Spanish	1.301	0.316
Cackiquel	0.999	0.287
Kekchi	3.343	0.883 *
Mam	1.913	0.545 **
Pocomochi	0.466	0.487
Other	0.936	0.561
Log Likelihood	-603.9	
Number of Obs.	3,075	

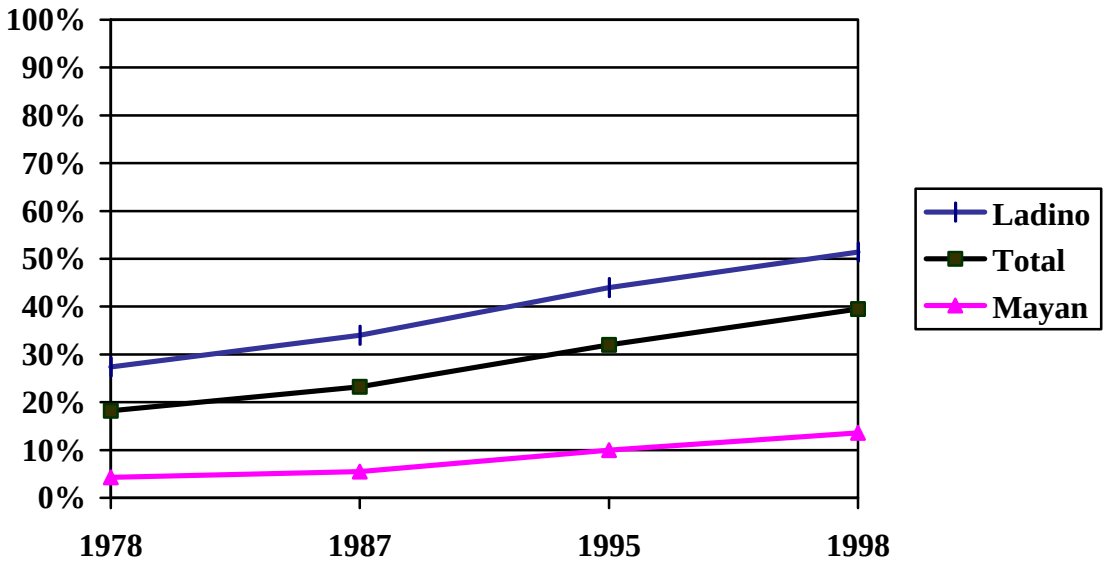
*Significant at the 1% confidence level
**Significant at the 5% confidence level

Table 8. Determinants of Modern Contraceptive Use: 1995/96 in 4 *Departamentos*
Women in Union, Ages 15 to 49; Results of the Logit Model

	Odds Ratio	Std. Err.	Odds Ratio	Std. Err.
	Within 5 Minutes		Within 10 Minutes	
Access to FP Services				
Within 10 minutes	1.200	0.303	0.861	0.186
Mayans within 10 minutes	2.417	0.990 **	2.301	0.840 **
Mayan	0.029	0.024 *	0.034	0.028 *
Age	1.041	0.010 *	1.042	0.010 *
Works outside home	1.233	0.233	1.275	0.239
Radio ownership	0.744	0.201	0.756	0.204
Television ownership	2.202	0.500 *	2.257	0.509 *
Education				
Primary	1.346	0.315	1.361	0.319
Secondary	1.882	0.620	2.085	0.680 **
Urban	1.457	0.274 **	1.468	0.287 **
Interactions				
Mayan*Age	1.024	0.018	1.020	0.018
Mayan*works	1.146	0.427	1.046	0.387
Mayan*radio	1.505	0.848	1.480	0.836
Mayan*tv	1.201	0.500	1.234	0.509
Mayan*prim	1.080	0.472	1.088	0.474
Mayan*sec	5.311	3.490 **	4.842	3.078 **
Log Likelihood	-580.3		-583.1	
Number of Obs.	1,979		1,979	

*Significant at the 1% confidence level
**Significant at the 5% confidence level

Figure 1. Contraceptive Prevalence in Guatemala by Ethnic Group and by Year



References

Asociación Pro Bienestar de la Familia Guatemalteca (APROFAM) and Centers for Disease Control (CDC), *Encuesta Nacional de Fecundidad, Planificación y Comunicación de Guatemala – 1978*, APROFAM: Guatemala City, 1978.

Asociación Pro Bienestar de la Familia Guatemalteca (APROFAM) and Centers for Disease Control (CDC), *Family Planning and Maternal/Child Health Survey Guatemala 1983*, APROFAM: Guatemala City, 1983.

Bertrand J, Guerra de Salazar S, Mazariegos L et al, Promoting Birth Spacing among the Maya-Quiché of Guatemala, *International Family Planning Perspectives*, 1999, 25(4): 160-167.

Castrillo M and Evans M, Baseline Information of Four NGO Projects in the Guatemalan Altiplano, The Population Council, 1998.

Cabarrus, Carlos Rafael. "La Cosmovisíon K'ekchi en proceso de cambio," UCA editores El Salvador, 1979.

Enge, K. and P. Martinez-Enge. 1993. "Land, malnutrition and health: the dilemmas of development in Guatemala." In Stonich, S. ed. *I am Destroying the Land!: The Political Ecology of Poverty and Environmental Destruction.* Boulder, CO: Westview Press, pp. 75-101.

Haeussler, Rafael. "Demanda Total y Necesidad no Satisfecha de Planificacíon Familiar en Guatemala y su Diferenciacíon étnica. (unpublished manuscript from CELADE workshop, 1992).

Instituto de Nutrición de Centro América y Panamá (INCAP), Ministerio de Salud Pública y Asistencia Social, U.S. Agency for International Development (USAID) and Macro International, *Salud Materno Infantil en Cuatro Departamentos del Altiplano, Resultados de la Encuesta de Proveedores de Salud 1997*, Calverton, MD, USA: Macro International, 1999a.

Instituto Nacional de Estadística, Ministerio de Salud Pública y Asistencia Social, U.S. Agency for International Development (USAID), United Nations International Children's Fund (UNICEF), Fondo de Población de las Naciones Unidas (FNUAP) and Macro International, *Encuesta Nacional de Salud Materno-Infantil, 1998/99, Informe Preliminar*, Calverton, MD, USA: Macro International, 1999b.

Ministerio de Salud Pública y Asistencia Social, Instituto de Nutrición de Centro America y Panamá, Institute for Resource Development, Instituto Nacional de Estadística, USAID, UNICEF, UNFPA and Macro International, *Encuesta Nacional de Salud Materno-Infantil, 1987*, Guatemala City.

Ministerio de Salud Pública y Asistencia Social and Instituto Nacional de Estadística, USAID, UNICEF, UNFPA and Macro International, *Encuesta Nacional de Salud Materno-Infantil 1995/96*, Calverton, MD, USA: Macro International, 1996.

Santiso, R. and J.T. Bertrand, 2000. "The Stymied Contraceptive Revolution in Guatemala." (unpublished manuscript prepared under The MEASURE *Evaluation* Project).

The Population Council, *Findings and Lessons Learned in Delivery of Reproductive Health Care to the Rural Mayan Population of Guatemala, from Operations Research and Diagnostic Studies, 1994-1997*, New York: Population Council, 1998.

The Population Council, *NGO Strengthening Program, Processes and Lessons Learned*, Guatemala City: Population Council, 1999.

Population Reference Bureau, Population Data Wall Chart. Washington, DC, 1999.