ISOLATION OF FACTORS RELATED TO FERTILITY AND FAMILY PLANNING IN TRINIDAD AND TOBAGO

by

Carol Theodora Cumberbatch

A thesis
presented to the University of Manitoba
in partial fulfillment of the
requirements for the degree of
M.A.
in
Department of Geography

ISOLATION OF FACTORS RELATED TO FERTILITY AND FAMILY PLANNING IN TRINIDAD AND TOBAGO

BY

CAROL THEODORA CUMBERBATCH

A thesis submitted to the Faculty of Graduate Studies of the University of Manitoba in partial fulfillment of the requirements of the degree of

MASTER OF ARTS

ABSTRACT

In 1967, the government of Trinidad and Tobago officially supported a Population Policy and established a National Family Planning program (NFPP). The birth rate was targeted to drop from 28.2 per 1000 in 1967 to 19 per 1000 in 1977. However, by 1976 the birth rate was still 23.8 per 1000. The number of new acceptors and current users of contraceptives attending the NFPP clinics was also below the target set.

The concern of the thesis was therefore with fertility, contraceptive use and the National Family Planning Program. The thesis specifically strove (a) to identify and compare factors related to fertility and contraceptive use and (b) to assess the role of the NFPP.

Two complementary cross-sectional studies were conducted. The first used fertility, cultural and socio-economic data from the 1970 Census of Trinidad and Tobago and statistics from the NFPP (av. 1975-76). Correlation analysis was performed on these data. The second study used demographic, cultural and socio-economic data from a survey which was conducted in Trinidad, in 1978, specifically for this thesis. Four communities were surveyed, one urban (Port-of-Spain), one semi-urban (Marabella), one rural (San Raphael) and one rural remote (Toco). These survey data were thoroughly assessed on the basis of cross-tabulations of inter-group average fertility and percentage contraceptive users. Analysis of variance (fertility) and chi-square (contraceptive use) were used as statistical tests of significance.

The results of both studies were quite similar and/or complementary: (1) They identified the rural residents, the young in rural areas, the 'single' female, that is in visitor or common law unions, the least educated, the unemployed and the menially employed as most needing the attention of the National Family Planning Program. Those segments of the population had highest, or the potential for highest fertility and displayed lowest contraceptive usage. (2) Even though the NFPP did not reach its target for 1977, it still plays an important role in contraceptive use. Thus, the secondary data found that of all the cultural, socio-economic variables used in the analysis, the family program variable accounted for 54% of the total 67% variance in contraceptive usage. The primary data also found the family planning clinics to be a very important source of supply for rural residents. Over 50% of contraceptive users in these areas were thus supplied.

Based upon the results it was recommended that (a) the approach to solving the problem of population growth be a mixed one focusing on improving socio-economic conditions and on increasing family planning activities, (b) that special attention be given to the groups identified as high in fertility and low in contraceptive use, (c) that the number of family planning field workers be greatly increased, and (d) that advertisments continue to make the public aware of the problems created by high population growth and that cost-free contraceptives are fairly easily available.

ACKNOWLEDGMENTS

I would like to thank:

Mr J. Harewood, head of the Institute of Social and Economic Research, University of the West Indies, St Augustine Campus, and Mrs N. Abdulah, Research Fellow, for their assistance and for allowing me the use of the Institute's library and an office.

Mr D. Hunte, of the Trinidad and Tobago Central Statistical Office, Social and Economic Division, for his invaluable assistance with the survey and for ensuring that all household lists were updated.

Dr B. Johnston and Mr R. Amoh, Department of Statistics, University of Manitoba, for assistance in the statistical analysis of the survey data.

Dr A. Latif for his help in the initial stages of the thesis.

Nurse M. McShine, head nurse at the Population Council and Nurse Cuffy, a field worker, for their assistance with information pertaining to the Population Council and the Family Planning Clinics.

Dr J. Rogge, my supervisor, whose concern, unfailing assistance and availability at all times are greatly appreciated.

The other members of my committee:- Dr A. Kristjanson and Dr H.L. Sawatzky for their assistance.

Finally, I would like to express deepest appreciation to my parents, my brothers, sisters, sister-in-law and Basil Ojukwu for their support.

CONTENTS

PART III -- SURVEY ANALYSIS

LIST OF TABLES

LIST OF FIGURES

PART I

INTRODUCTION TO THE STUDY

Chapter 1

INTRODUCTION

INTRODUCTION

The problem of rapid population growth is of considerable importance to countries of the Third World as they strive to develop their economies. The introduction of National Family Planning Programs has been one of the main approaches to solving this growth problem. The Caribbean republic of Trinidad and Tobago is certainly no exception. In 1967, when the government recognised that population growth was retarding its efforts towards further development, it officially supported a Population Policy and established a National Family Planning Program (NFPP) whose principal aim was to reduce birth rates.

This thesis therefore addresses itself to an identification of factors related to high/low fertility and greater/lesser use of contraceptives. The focus will be on isolating variables related to intra-national differentials in fertility and contraceptive use. This will be done via two complementary, cross-sectional studies. The first (part 2) uses secondary, aggregate data. The second (part 3) uses primary, survey data. The ultimate aim of this research is to determine more precisely who the target population for the NFPP should be.

To put the study into some perspective for future discussion, a brief history of the population of Trinidad and Tobago and of its family planning program is essential.

HISTORY OF THE POPULATION OF TRINIDAD AND TOBAGO

The population of Trinidad[1] has gone through a series of changes in its growth, structure and composition. Prior to the 20th Century this tropical island was underpopulated and so there was a great demand for labour especially for the labour-intensive plantation (principally sugar) economy. Consequently since discovery in 1498, the Spaniards and especially from 1783 the British colonial powers had to import labour. First it was slaves from Africa and then, after the abolition of slavery in 1834, indentured labour from India. Thus for more than four centuries, over 90% of the total population growth was due to net immigration rather than natural increase (Harewood, 1975).

The 20th Century, specifically the period after the abolition of the indenture system in 1919, saw a new era in the history of population growth in Trinidad and Tobago. Not only did natural increase supercede immigration as the prime contributor (90%) to population growth, but also for the first time the concern was with overpopulation and the problems created thereby.

Two factors operating almost simultaneously have been responsible for this acceleration in the growth rate. In the first place the death rate per 1000 had been declining consistently from 23.7 in 1921, to a low 8.3 in 1960 (Harewood, 1975). Coupled with this since 1931, the birth rate per 1000 was on the increase, moving from 37.3 in 1931, to 41.9 and 39.1 in 1946 and 1960. Thus, as Table 1.1 shows, the annual rate of growth more than doubled from 0.92% during 1911-1921, to 2.87% for the period 1946-1960. Both the gross and net reproductive rates

---

[1] To a certain extent the early history of the two islands differ. Therefore most references will be made to the larger island, Trinidad.

also confirm this substantial increase in actual fertility (Table 1.2). In 1920-22 the GRR was 1.80 and the NRR 1.10. They both rose considerably to 2.66 (GRR) and 2.45 (NRR) in 1959-61.

TABLE 1.1

POPULATION GROWTH - 1901-1960

Inter-censal Period	Population at end of Period	Total Growth	% Growth	Average No. added Per Annum	Annual Rate of Growth
1901-1911	333,552	59,653	21.78	5,965	1.99
1911-1921	365,913	32,361	9.70	3,236	0.92
1921-1931	412,783	46,870	12.81	4,687	1.21
1931-1946	557,970	145,187	35.17	9,679	2.03
1946-1960	827,957	269,987	48.39	19,284	2.87

Source: Social Indicators, Trinidad and Tobago Central Statistical Off. October 1975, Table 1.5, pg. 7.

TABLE 1.2

GROSS AND NET REPRODUCTIVE RATES - 1920-1961

	Gross Reproductive Rate		Net Reproductive Rate	
Period	Rate	Index (1921=100)	Rate	Index (1921=100)
1920-1922	1.80	100	1.10	100
1930-1932	1.67	93	1.20	109
1945-1947	2.36	131	1.92	175
1959-1961	2.66	148	2.45	223

Source: The Population of Trinidad and Tobago, Jack Harewood, C.C.R.E.D. Series, 1975, pg. 45.

Thus by the mid 1950s, population growth was phenomenal. Like most countries though, government's reaction via a definite policy to reduce population was slow in arriving, and when it did so family planning was the program used to implement the policy.

HISTORY OF FAMILY PLANNING

Even though the first but short-lived private family planning clinic was opened in 1956, when the population growth rate was 3% per annum, it was not until 1959 that a family planning clinic was located in the capital city of Port-of-Spain. In 1960 the private Family Planning Association (FPA) was formed and in 1961 it became the 32nd member of the International Planned Parenthood Foundation (IPPF).

During this time the government was still either not concerned with or else was skeptical about supporting a population control program, especially in the face of opposition from the Roman Catholic Church, whose members comprised 38% of the total population. In many respects Independence in 1962 may have been the turning point. With the help of the oil industry, serious efforts were being made by this newly independent nation to develop its economy. Yet population growth was a great deterrent. For example, in 1960 the youth dependency ratio was 80 per hundred active population (C.S.O., 1975), unemployment was also high and expected to rise even more. At that time 11.5% of the national budget had to be allocated to education and another 11.2% to health and even so much was still left to be done. Over 60% of the houses were inadequate, yet the various government house building projects could not take care of present, let alone future needs. Consequently when the Second Five

Year Development Plan (1964-1968) was being formulated in 1963 economic planners

> stressed the need to bring about a better balance between national birth and death rates and the problems involved in meeting the needs of a rapidly growing young population (Andrews, 1975).

Other groups, notably the Medical Association, expressed similar concerns about population growth.

It took the government two years to respond to these pleas. Thus it was only in 1965 that an Ad Hoc Committee was formulated to look into the matter of family planning. Another two more years would elapse before the government came out in official support of population control and establish a National Family Planning Program (NFPP) to reduce the national birth rates from 28.8 per 1000 in 1967 to 19 per 1000 by 1977. A Population Council, under the aegis of the Ministry of Health, was appointed to act in an advisory and coordinating capacity.

The National Family Planning Program

The National Family Planning Program is comprised of three agencies. Two of these are private, the Family Planning Association (FPA) and the Catholic Marriage Advisory Council (CMAC). The third is the government's own Family Planning Association.

(1) The Family Planning Association (FPA) This private organization began operating in an official capacity in 1961 when it became an International Planned Parenthood Foundation (IPPF) member. In 1968 it had 8 clinics with 13,000 registered (Andrews, 1975). By 1976, when the government's program was well off the ground, the FPA ceased operation in 3 of its clinics. A wide range of birth control methods is

available, notable among them being oral contraceptives, the IUD and diaphragm. Sterilization is done at its Port-of-Spain clinic. Community-based distribution and education services also form part of the program. Apart from direct birth control services, the FPA provides urine pregnancy testing, infertility testing and cancer screening (NFPP's Annual Report, 1976). These services are provided for a token fee.

The funds for the organization come from the sale of the products, the Trinidad and Tobago Government, and externally, for example, from the IPPF. The FPA's expenditure for 1976 reached $569,266TT which was $38,794 in excess of that year's income (Annual Report, 1976).

(2) The Catholic Marriage Advisory Council (CMAC) In 1968, when the government began taking an active part in birth control, the Roman Catholic Church decided to provide family planning services for its members through the Catholic Marriage Advisory Council, whose purpose was to advise principally engaged and married couples on marriage and family life. As expected, the rhythm method, especially the temperature rhythm method, is the only one which is used. Funding comes mainly in the form of subventions from the Trinidad and Tobago Government, but donations are also received. In 1976 its expenditure was $12,661 of which $10,000 came from the government (Annual Report, 1976).

(3) The Government's Family Planning Program (GFPA) In terms of effort, numbers reached and geographic spread this is the most important of the three agencies. In the locating and staffing of its family

planning clinics advantage was taken of already existing hospitals and/or health offices. In 1968 there were 8 GFPCs. By 1976 this number had risen to 76, 70 of which were located in Trinidad and 6 in Tobago. Of the 70 in Trinidad, 6 were male centres and 54 were integrated with maternal and child health services.

One of the main requirements of the government's program is that service is to be free of charge and easily available. All approved methods of birth control are available, especially oral contraceptives, IUD and diaphragm. Tubal ligation is offered on request but is only available at major hospitals. Up to 1977 abortions were not easily available, being only provided on medical grounds and even so these were not available at most clinics. Therefore, the rate of illegal abortions and resultant injuries was high.

Apart from direct family planning services there is also an education program which is carried out via the mass media, the various community youth and adult organizaions and on a personal level (McShine, 1974). Emphasis is being placed on the young population. Consequently, wherever staff is available and trained, sex and family life education is being taught in the secondary schools. Each year there is a Family Planning Week, the objectives of which are:-

(a) to increase the public's awareness of the population problem,

(b) to focus attention at all levels of society on family planning and on the services offered by the NFPP, and

(c) to promote a favourable attitude to family planning and thereby increase the number of contraceptive users.

Funding When the program first began in 1967 the Trinidad and Tobago Government planned to allocate $200,000TT yearly for the first five years. By 1971, however, a total of $298,161.62TT had to be released since expenditure that year totalled $292,350.52TT (NFPP's Annual Report, 1971). Some external aid is also received, for example from the World Bank.

New Acceptors

In 1965, that is before the NFPP began functioning, the FPA had 7870 new contraceptive acceptors (Andrews, 1975). With government's official anti-natal policy and program, family planning was given respectability, consequently since 1967 the acceptance rate has been increasing, averaging between 5% and 8% of females 15-44, yearly.

In 1968 there was a total of 12,660 new acceptors with 4760 attending the few government clinics that had just opened, while 7690 went to the FPA's clinics. By 1970 there were 14,470 new acceptors (8.6% females 15-44), of which 4473 attended the FPA's clinics and 9797 the government's. This 9797 though, was far short of the government's target of 15,000.

Current Users

In 1970 the Government's clinics had 15,525 active users, the FPA 11,748 and the CMAC 757 (Table 1.3). This gave a total of 28,030 active users or 14.2% of the female population 15-44 years. Each year the users continued to increase in number. Even so the 36,715 active users in 1976 (Table 1.3) was again far short of the 50,000 target set for 1977.

TABLE 1.3

ACTIVE USERS OF FAMILY PLANNING CLINICS - 1970-76

Agency	1970	1971	1975	1976
Government	15,525	17,665	17,050	19,370
F.P.A.	11,748	12,983	19,084	17,307
C.M.A.C.	757	552	52	38
TOTAL	28,030	31,200	36,186	36,715
Users as % Females 15-44	14.2%	18.5%	21.5%	21.8%

Source: NFFP Reports, 1971, 1975, 1976.

Thus by 1976 not only did the program fall short of its target number of active contraceptive users but the country's birth rate had not declined to the targeted 19/1000. As late as 1975 the birth rate was still 23.8/1000. Consequently this thesis aims at identifying which segment(s) of the population have the highest fertility and the least percentage of contraceptive users.

PURPOSE OF THESIS

The primary concern of the thesis is with contraceptive usage. Thus it seeks to identify those groups of the population who are most in need of attention by the NFPP. This would include those segments of the population (a) with actual or the potential for high fertility, and (b) who show least evidence of contraceptive usage. This aim would be achieved by an identification and examination of factors related to intra-national differentials in fertility and contraceptive use in Trinidad and Tobago.

Recognising that actual fertility levels, unlike fecundity, is a reflection of the use and degree of use or non-use of contraceptives, the analysis will initially focus on an identification of similarities and differences in the relationships between fertility differentials and socio-economic and cultural variables on the one hand and contraceptive use and those same socio-economic and cultural variables. Prior to the introduction of the Trinidad and Tobago National Family Planning Program in 1967, fertility differentials and consequently, differentials in birth control existed, for example, between: (a) urban and rural residents, with the latter having higher fertility and thus less evidence of contraceptive use than the former, (b) educational groups, that is, the more educated versus the un- or less- educated, (c) occupational groups, for example, agricultural workers having larger families than non-agricultural workers, and (d) ethnic groups. Here historically East Indians have had much higher fertility than the rest of the population (Brawer, 1965; Harewood, 1975). If these fertility differentials still exist, would contraceptive use show the same differentials now that family planning has been given credibility via government sanction and has subsequently been introduced on an island wide basis? Would these same differences persist now that more effective methods of family planning are fairly easily accessible either inexpensively as at the Family Planning Association's clinics, or else free of charge as at the Government's own clinics, to almost the entire population irrespective of geographic location, educational attainment, occupation, religion or race? Or would the family planning program still appeal mainly to those groups or sectors of the population who

would have regulated their fertility in any case, even without the program's existence? Or would it now appeal to all sectors of the population to the same degree? This approach is therefore different since it looks at contraception and fertility comparatively.

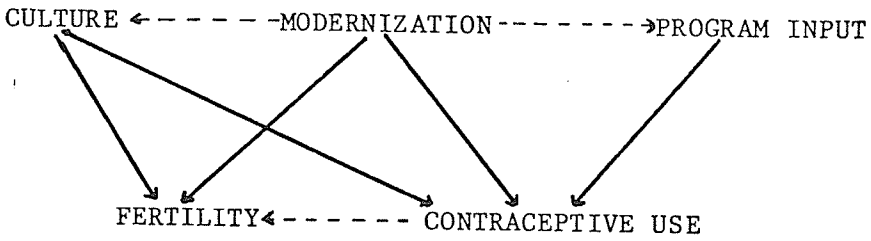
As an extension of the above the thesis will also attempt to examine the effectiveness of the National Family Planning Program (NFPP). Its effectiveness will be judged by the response of the population via their use of the available services. (This will be examined in greater detail with the survey data.) Of special concern is the use by those sectors of the population, for example rural residents, who in the absence of these family planning facilities and services perhaps would not normally consciously or as effectively practice birth control. The reasons for this non-use would have been (a) lack of knowledge about birth control (b) the high cost of unsubsidized contraceptives, and (c) the lack of family planning clinics where such supplies would be available either free or for a token fee.

Apart from the above, the thesis would also examine the relative importance of the family planning input variable vis-à-vis the other variables, especially the socio-economic or modernization variables. One of the most debated and as yet unresolved issues among population researchers and planners is that of the relative importance and contribution of National Family Planning Programs versus socio-economic development, to family size or actual reproduction. (This will be discussed in greater detail in Chapter 2.) On this point, the thesis would differ from most other studies which examine the relationship between modernization and family planning program either jointly or each

independently to contraceptive use and consequently to fertility levels or fertility decline. However, the concern in this present research is not with the effect of these modernization and program factors on fertility change. It is too early in the history of the NFPP to really state with any degree of accuracy, whether fertility changes, if any, are due to its program. At this stage in the history of the NFPP, it is more meaningful to assess factors related to contraceptive use. An increase in such contraceptive usage, whether as a direct or indirect result of the program and/or other factors, like modernization, would of course, ultimately serve to reduce fertility. Thus, fertility levels will be excluded from that section of the analysis which deals with input to the National Family Planning Program and contraceptive use (Part 2, under Program Input Variable). Since contraceptive use is the key issue here, it is more valuable and essential to examine the relationship such usage has to the program input and/or moderniztion factors.

Remember though, that this model only applies to that section of the study pertaining to the relationship between program input and contraceptive usage. As mentioned earlier, fertility is used in the rest of the thesis, but once more the concern is not with fertility change. The analysis specifically seeks to identify groups of high or potentially high fertility, that is, those who would need most attention from the NFPP. Thus the model used for the rest of the thesis is shown in Fig. 1.1. The solid lines denote that relationships are sought between fertility and the cultural and modernization variables and/or between contraceptive use and the cultural, modernization and program variables. The broken lines denote other possible links not dealt with here.

Figure 1.1: THE MODEL



PART II

CENSUS DATA ANALYSIS

Chapter 2

LITERATURE REVIEW

DATA SOURCE

This part of the thesis uses secondary, aggregate data. The approach is cross-sectional. Two data sources are used. They are:

(1) The Census of Trinidad and Tobago, and

(2) The Population Council.

THE CENSUS OF TRINIDAD AND TOBAGO - 1970

Except for family planning statistics, all other statistics were taken from the Census of 1970. The smallest areal unit for which statistics were available with any consistency, to the public, were wards. Since the family planning data for Trinidad were only available for 25 units, 7 wards had to be annexed to form 3 units. The three main towns were incorporated into their respective wards. Therefore, twenty-six areal units were used (Fig. 2.1). Tobago was one of these twenty-six.

Only in one instance was a larger unit division used and that was to accommodate the statistics on education for which no data were available at the ward level. Consequently, the 9 county divisions had to be used (Fig.2.2).

Census Data Quality

It is generally believed that there was about an 8% under-enumeration at the 1970 Census of Trinidad and Tobago. The actual

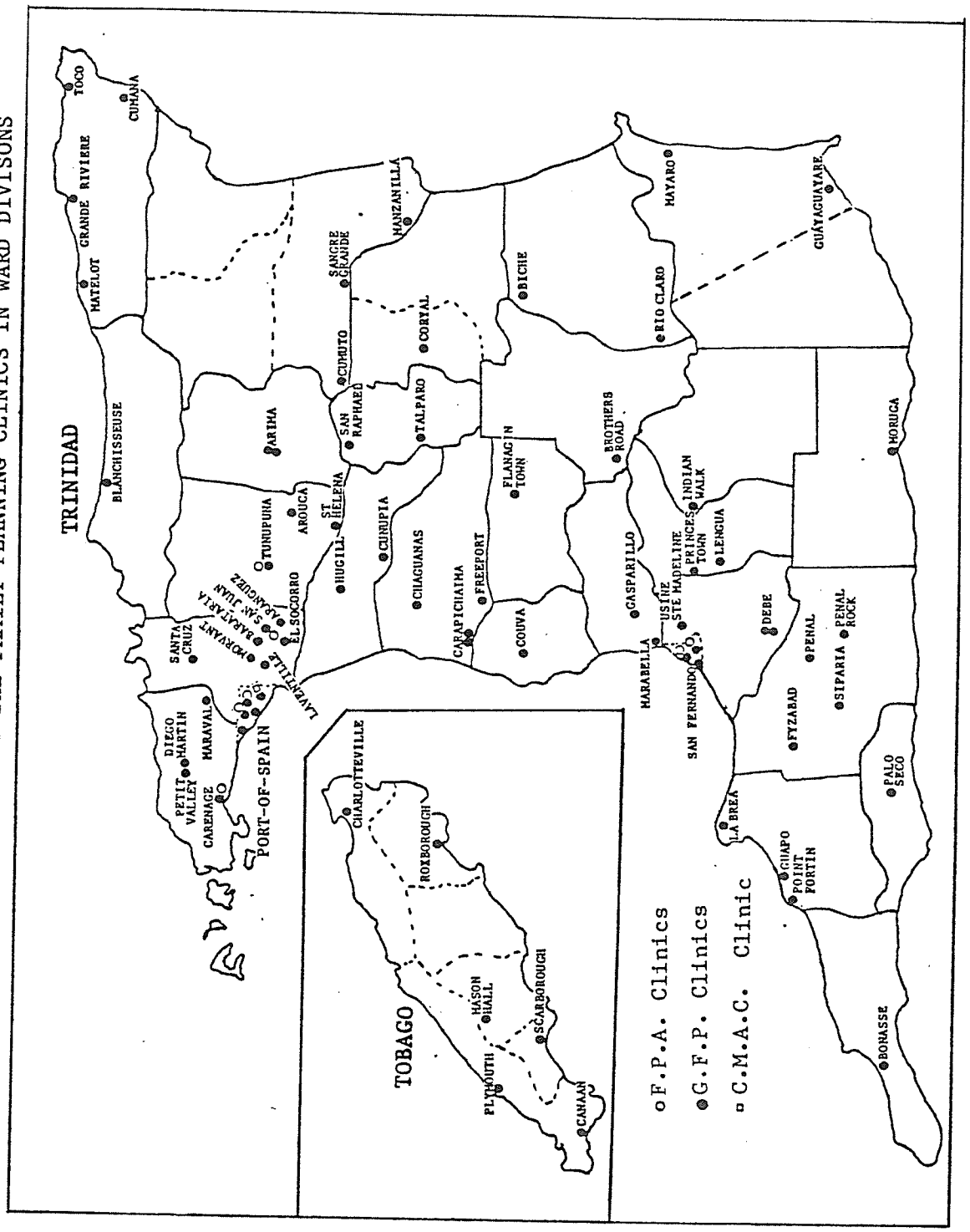


Figure 2.1: LOCATION OF THE FAMILY PLANNING CLINICS IN WARD DIVISONS

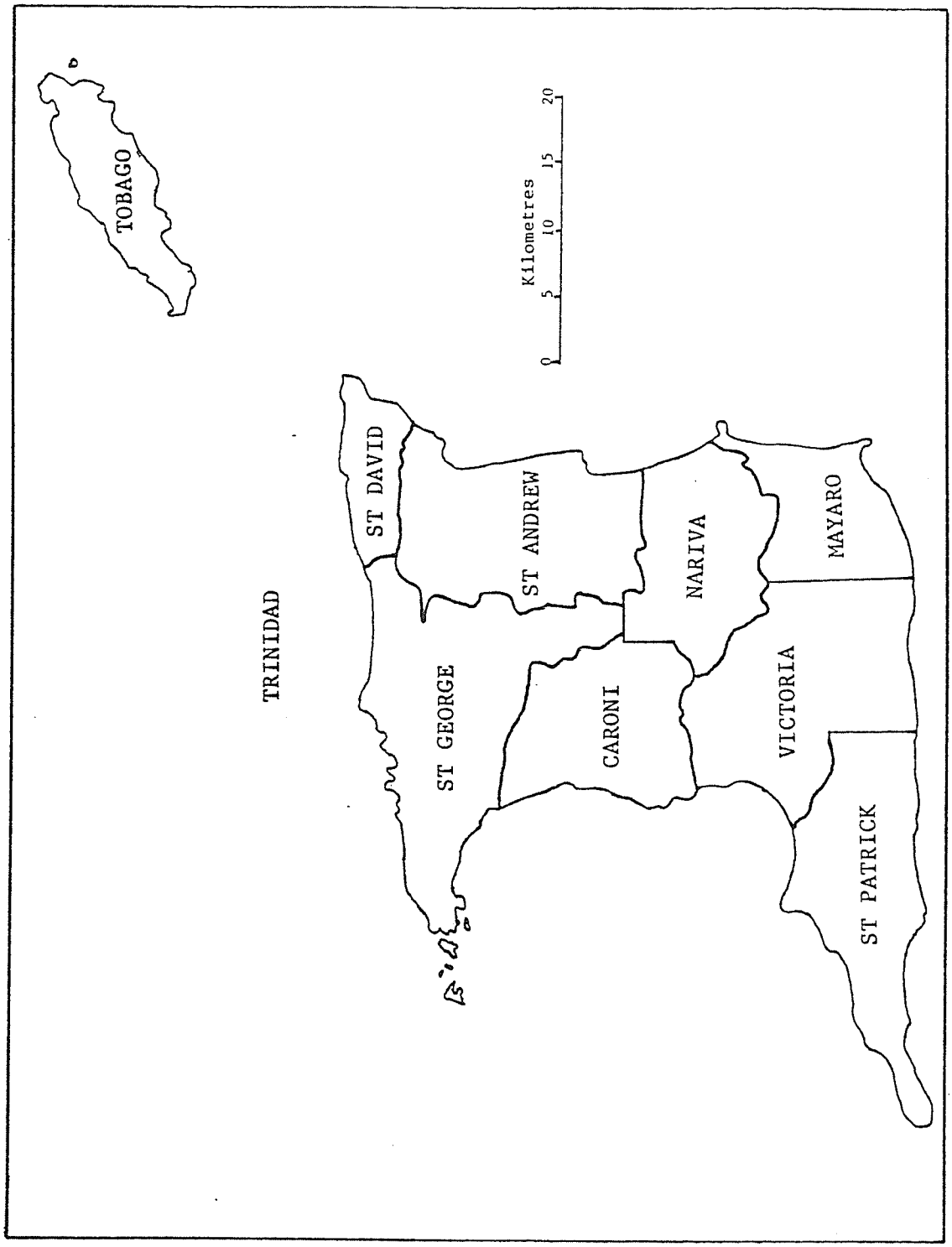


Figure 2.2: TRINIDAD AND TOBAGO: COUNTY DIVISIONS

1970 Census population was 940,719 while the expected population was 1,021,030. Yet Harewood, one of the nation's leading population statisticians notes that:

> the difference between many of the vital rates and other measures derived from the two populations is not appreciable. In hardly any case would the general conclusions be affected if one figure is used in preference to the other (Harewood, 1975:11).

Thus even though the census of 1970 is not 100% accurate, and no census really is, it is dependable enough for use in this analysis.

THE POPULATION COUNCIL

The data on family planning come from the Population Council of Trinidad and Tobago, which is under the aegis of the Ministry of Health. As the coordinating body for family planning activities, the Population Council compiles monthly, quarterly and annual reports on the number of old cases, new cases, revisits, dropouts and dropouts returning to each of the Government's Family Planning Clinics, the Family Planning Association's Clinics and the Catholic Marriage Advisory Clinic. Apart from total and average attendances, the report also gives the number of family planning sessions per clinic.

In order to obtain fairly unbiased family planning figures the average for two consecutive years was used. The choice of one specific year alone, whether randomly selected or not, may not give a true picture of the general year to year performance. For example, the year chosen may be an exceptionally bad or good year for family planning clinic performance. Thus the reliability of the statistics and the results produced therein would be questionable. When the average for two years is used, the likelihood of this happening is at least reduced and

at best eliminated. The two years selected were 1975 and 1976, that is, the two most recent years for which completed statistics were available when the research was conducted. The 80 clinics (72 Governmnent's, 7 the Family Planning Association's, and 1 for the CMAC) were placed in the 26 ward divisions. Fig. 2.2 shows the location of the various clinics.

Data Quality

The family planning statistics are quite reliable. At least in theory, the method of collecting and recording information is efficient. Each new client is given a clinic card, and subsequent visits are recorded on a file which is kept at the clinic. The clerical staff compiles reports based on this information.

VARIABLE SELECTION - LITERATURE REVIEW

Variables were selected on the basis of their relevance to the present research problem, on the importance they have shown in past research of a similar nature and on their relevance to the society under study, that is, Trinidad and Tobago. They have been grouped under the general headings of dependent and independent variables. However, causility does not enter into the analysis. In the section on independent variables a brief review of relevant literature is essential to support or validate each variable's inclusion in the analysis. The following then is the list of selected variables along with an indication of how each variable is to be represented.

DEPENDENT VARIABLES

Briefly, the aims of the thesis are:

(1) To identify segments of the population most needing the attention of the NFPP. This would include (a) those groups with actual or the potential for high fertility and (b) those who display lowest contraceptive usage.

(2) To compare the relationships, if any, between fertility and contraceptive use to selected variables, and (3) To determine the importance of the NFPP, especially vis-a-vis the other variables.

Thus the two dependent variables are:

1. Fertility; and
2. Family Planning

FERTILITY

The measure of fertility used is the child-woman ratio (CWR) also called the Fertility Ratio (FR), whose formula is:

$$CWR = \frac{\text{No. of Children 0-4 yrs}}{\text{No. of Females 15-44 yrs}} \times 100$$

In the absence of vital registration data which gives the most accurate indication of the number of births and consequently of fertility, the child-woman ratio (CWR) is an adequate substitution. It has been used in several UN studies on fertility differentials in Latin America (Carleton, 1968:17) and also in studies by Brawer (1965), Heer and Turner (1965), Kasarda (1971) and Stinner et al (1975) and Albuquerque and Stinner (1976).

The main disadvantage of the use of children under five as the numerator is that it can underestimate fertility since it excludes those children who died prior to reaching age five (Brawer, 1965; Carleton, 1965; Jones 1977). This point though would be valid for real macro level, international studies where great disparities in infant and child mortality exist between nations. In the present study the concentration is on fertility differentials within a small nation where one does not expect to find great intra-national variations in infant and child mortality. Another criticism laid against use of the CWR is that since it uses census data it is subject to enumeration errors, especially under-enumeration of children under five. Yet, for Barbados, a Caribbean island similar to Trinidad and Tobago, Jones (1977:159) comments that misreporting is less likely in a society with high literacy rate. The same could be said for Trinidad and Tobago where over 90% of the adult population is literate. Also for data as early as 1946, Brawer notes that both birth registration and census underestimate actual fertility "but the total error is reduced by using the combined ages 0-4 as the basis of the fertility measurement" (Brawer, 1965:10).

The denominator, the number of females 15-44 years, is quite appropriate in that it only includes those women in their fecund years. Thus even though the CWR suffers from the setbacks mentioned above, yet, in itself, it is an adequate measure of fertility especially for the purpose in mind, that of analysing fertility differentials.

This same sentiment is expressed by Brawer, who after citing past empirical studies which use and justify the use of the CWR or FR, concludes that:

> the use[2] of the fertility ratios, for comparing differences or changes in fertility levels is justified and provides a comparative measure of fertility which is sufficiently accurate for these purposes (Brawer, 1965:103).

Stycos (1968) in Human Fertility in Latin America emphasises the fact that "despite a priori limitation of the child- woman ratio as a measure of fertility, it would appear to bear a close relationship to more direct measures". In fact high correlations were recorded between the child-woman ratio and the birth rate (.84), the general fertility rate (.92) and the total fertility rate (.91) for 8 Latin American countries with good census and vital registration data.

Thus in the absence of direct numbers of births per 1000 women or mothers in their fecund years, the child-woman ratio is a plausible alternative.

FAMILY PLANNING

The measure used to represent family planning or contraceptive use is the Family Planning User Rate (FPUR), devised by the author to be:

$$\text{FPUR} = \frac{\text{Contraceptive Users of Family Planning Clinics}}{\text{No. of Females 15-44 yrs}} \times 100$$

Statistics for the numerator were taken from the National Family Planning Quarterly Reports, which include users of both private and public clinics. The Current Users (CU) were derived as follows:

CU = New Cases + Old Cases - Dropouts + Dropouts Returned

---

[2] Emphasis Brawer's

The denominator only considers women in their fecund years. That is women who are at the risk of conceiving and thus would generally require contraceptives. The range is from 1.88% to 36.37%.

Before concluding this section on the family planning variable two points must be mentioned:

(1) As must by now be evident, the numerator and the denominator in the FPUR use different data sources and refer to different time periods. This, however, is unavoidable. Both data sources, though, are quite reliable and at least consistency is ensured since the same formula applies for each areal unit.

(2) The FPUR only measures the direct effect of the National Family Planning Program (NFFP) in that it only accounts for those contraceptive users who attend the various family planning clinics. This problem is not unique to this study nor this country. The survey analysis (part 3) will be most valuable since it includes both program and non-program or commercial users.

INDEPENDENT VARIABLES

INTRODUCTION

As a result of rapid population growth in many developing countries and the problems created therein, a multitude of studies have tried to identify factors related, whether causally or not, to fertility and fertility control. There now exists a wide array of variables - social,

economic, institutional, cultural and psychological - which are posited to be related to increased contraceptive use and consequently to fertility. Three types of variables have been singled out as being most pertinent to this study, which is designed to isolate key variables associated with greater contraceptive use and lower fertility in the context of the Trinidad and Tobago society. They are:

1) Modernization

In the realm of fertility and fertility control, variables under this heading have been most widely used by both researchers and planners. Socio-economic development has almost always been positively related to contraceptive use and inversely related to fertility.

2) Cultural Variables

Though perhaps not as widely employed as the structural variables, cultural variables still have prominence in fertility studies. In a heterogeneous society like that of Trinidad and Tobago, it is necessary to identify what relationship the various cultural or population influences bear to fertility. An important consideration is whether or not increased modernization would narrow, nullify or heighten differences which in the past have been related to cultural factors.

3) Program Input Variable

Within recent times the introduction of National Family Planning Programs has been advocated by some as one very important and necessary way of curbing high fertility in the developing world. These programs aim at increasing contraceptive use, especially among those with the potential for high actual fertility. This is done in the hope that excessive

birth rates, at the national level, would reduce. This aim is generally facilitated through educating the populace about more effective means of birth control and providing supplies for practising such control. Trinidad and Tobago is one such nation with a National Family Planning Program. Thus it is essential to examine the relationship between program input and contraceptive use and thereby assess the extent of the program's usefulness.

MODERNIZATION

The theory of Demographic Transition or the 'Vital Revolution' is the most cogent one in population literature to clearly state that a causal relationship exists between fertility and socio-economic development, the latter going under the rubric 'modernization' or 'development'. Demographic transition theory is more or less a very general "descriptive interpretation of the transformations that took place in European demographic patterns during the 19th C" (Teitelbaum, 1975:421). Briefly the theory states that as a premodernized society, characterised by high mortality and high fertility (stage 1), moves towards development, its first demographic variable to change is its death rate which will drop as a result of better sanitation and health care. Thus, this initial transitional stage (stage 2), is characterised by large population growth brought about by declining death rates accompanied by yet unresponsive and high birth rates. After some time (the exact timing is unspecified by the theory), increasing modernization with its resultant

structural changes, for example, "transition from familial to capitalistic production" (Caldwell, 1978:567), increasing urbanization, industralization and literacy, plus the negative effects of high population growth, necessitate a move to smaller family size. Once both fertility and mortality are at more or less stable low rates, and population growth is consequently low, the society is said to have completed its demographic transition (stage 3).

In the face of new and changing demographic trends around the world, the theory has been subjected to much criticism, especially for its lack of a "specifiable and measurable mechanism of 'causation' and a definite time scale" (Teitelbaum, 1975:421) which limits its use especially in a predictive context. For example critics have said that it failed to predict or explain why the post - World War 11 economic recovery in the U.S.A. and the 'baby-boom' occurred simultaneously. According to the theory, economic development should have a negative rather than positve relationship with fertility. Another of its flaws is that it falls short in its ability to chart or predict the demographic course of newly developing societies. Here, due to imported medical technology, death rates have dropped drastically and in a short time span, but in many countries birth rates have remained high or even shown increases.

Despite these criticisms the theory can generally be defended. In the first place the 'baby-boom' is somewhat of a demographic anomaly. The depression, and then the war, resulted in a reduction in the marriage rate and births. The economic recovery after the war placed the population in better socio-economic situations: (a) to marry - the age

at marriage actually dropped (Peterson, 1975:551), and, (b) to commence or predate family formation, or else to increase family size. This situation, though, was only a short term response to a set of unexpected and unusual conditions. Births declined during the 1960s and have since remained low. So in the long run there remained a net negative effect of economic development on fertility. Thus what has to be recognised is that the 'theory' does not make allowances for short term fluctuations or anomalies.

With regards to the theory's other mentioned flaw, what must be realised is that in much of the developing world death rates declined not as a result of rapid development within these countries but because they were able to import medical technology from the developed world. Thus until there are the necessary changes associated with lower fertility, for example social and economic development, or else perhaps some other direct intervention, for example incentives to make small-size families desirable, or else the distastful strategy of coercion to limit births, or the still questionable introduction of national family planning programs, birth rates will remain high. Although the causal aspect of transition theory remains unproven, empirical evidence, nevertheless, does show that fertility and development are negatively related (for example Agyei [1978], in Jamaica). Though the pace of development and demographic transition in the developing world cannot be precisely predicted, there is room for optimism. For instance Dudley Kirk has indicated that

> a growing number of countries have been entering the demographic transition on the natality side since World War 11 and after a lapse of some 25 years in which no major country entered this transition (Kirk, 1972:145).

He identifies a few countries in Latin America, South-east Asia and the Islamic world which are experiencing rapid fertility declines or else appear to be on the brink of such declines. Although recognising that development is the related factor, Kirk notes that there is no consistency in the threshold levels of development associated with fertility reduction.

Amidst all this what must be recognised is that social science, which includes fertility study, is not a 'pure' science. In social science man, with his ever-changing characteristics and behavior, is the subject and the object of study. Thus the unpredictable or unexpected can always occur to totally invalidate or destroy past 'laws', 'theories' or 'hypotheses'. A noteworthy phrase to be mindful of is that "knowledge does not exist in universally true statements" (Leibenstein, 1974:447). Thus transition theory, though lacking in the rigors associated with pure scientific theories, nevertheless has "generated some very general hypotheses which have been affirmed by subsequent events" (Teitelbaum, 1975:421). A few empirical studies will now be cited which generally support the theory's basic premise that fertility reduction/differentials are related to socio-economic development.

Oechsli and Kirk (1975) While deliberately avoiding analysis of causality they fit vital rates - 1962 and 1972 - for 25 Latin American and Caribbean countries into the development process via a development index circa 1962. Generally countries with a positive development index experienced declines in fertility of 0.5 per year while those with a negative index experienced very little or no change in fertility. Using a combination of fertility level and development index each country's position in this 'new' or 'renewed' demographic transition was given.

Srikantan (1977) Based on correlation analysis with cross-sectional data for 75 countries, each with over 5 million people, and 21 socio-economic indicators, he concludes that "the pattern of correlation among the indicators ... strongly support the hypothesis ...that the level of fertility is an integral aspect of development" (Srikantan, 1977:44).

Caldwell, Caldwell (1978) On a more micro scale, J. Caldwell and P. Caldwell's study shows that even in Ibadan City, Nigeria, where there is no fertiltity decline at the aggregate level, demographic innovation, that is the deliberate limitation of family size, is found among the more modernized females. Implicit in their findings is that a modernized outlook is associated with a change in family structure. Here a large number of children places more parental and economic burdens on this newly emerging nuclear and child-centred family.

Friedlander, Eisenbach and Goldscheider's (1978) study emphasises the complexity of the fertility - development relationship. Importantly it points to the fact that fertility change is not related to development per se but rather it is brought about more as a result of the institutional changes produced by development which cause conflicts between large family size goals and the maximization of opportunities[3]. Israel's Arab population, specifically the rural segment, experienced approximately 40 years of rapid socio-economic development before any fertility decline was noticeable. What is significant is that this development operated through the traditional social and political system, that is, via the Hamule and extended family. Social welfare schemes

---

[3] See Demerath (1976) for a more detailed description of these institutional variables.

such as child and maternity allowances enhanced rather than conflicted with large family size goals. Thus it took a very long time for any decline to occur and even so fertility rates are still relatively high.

These studies have generally all pointed to a negative relationship between modernization and fertility. This is where contraceptive use, birth control or its euphemism 'family planning' comes into play. Barring a natural disaster, biological infertility or subfecundity, fertility can only decline with the use of some method of birth control. This would include either traditional methods, such as sexual abstension, induced abortion and coitus interruptus, or modern methods, for example the oral contraceptives or injection. Birth control is therefore the important instrumental link between development and fertility differentials. The chain would therefore look like this:-

MODERNIZATION ----> BIRTH CONTROL ----> FERTILITY

Thus if fertility is related to modernization, contraceptive use must, by association, be also related to modernization as well as to fertility.

Finally, what remains to be done is to select variables which are representative of this holistic yet multifaceted process of development. A host of variables has been identified by several researchers to represent the various aspect of development[4]. It will be impossible to do full justice to all these variables. Hence a more meaningful approach is to select the very few pertinent ones which have shown most

---

[4] Studies by U.N. (1953), Berry (1960), Srikantan (1977), Mauldin and Berelson (1978) and Stycos (1978) give good summaries of these developmental variables.

consistent relationship with fertility and contraceptive use differentials and also for which data are available at the subnational level for Trinidad and Tobago. Consequently, four modernization variables are selected for this analysis. They are:

1. Urbanization
2. Industrialization
3. Female Education
4. Female Occupation

URBANIZATION

Urbanization is one modernization variable which has shown the most consistent relationship to lower fertility and greater contraceptive use (Stycos, 1978:411). Historically, higher levels of socio-economic development have been associated with higher levels of urbanization. This is so since most of the facets of development, for example, administrative and economic functions, mechanization or industrialization, better educational and health facilities, more varied and better employment opportunities, especially for females, find greatest expression in urban areas.

As the city becomes increasingly attractive, and economic socio-cultural possibilities widen, more rural dwellers leave the countryside, whether by 'push' or 'pull' factors, to take up city residence. However this move to the city should also be accompanied by a change in life styles and values. That is from a rustic lifestyle where the family is the prime institute of socio-economic activities, to a more urbane,

rationalistic one, more independent of tradition and where the family is just one of many institutions of socialization. Urbanism, or the acquisition of these urbane attitudes and values allow the individual to better respond to the demands and pressures of urban life (Rosen and Simmons, 1971:50). It is specifically this combination of urbanization and urbanism which result in the desirability of and the move towards family size which is smaller than in rural areas. This point is especially relevant in developing countries where rural to urban migration is proceeding at a rapid rate but not in all cases do the rural migrants become fully absorbed in city life, for example via educational, employment and socio-cultural institutions. This 'ruralization' of the cities is partly responsible for the sometimes cited high and undifferentiated fertility rates in developing cities vis-à-vis rural areas (Albuquerque and Stinner, 1976:55).

In a 1961 study, Robinson found that in India that the urban-rural fertility between 1921 and 1951 became increasingly more modest or non existent. He hypothesised this result to be partly due to the large number of migrants in cities, over 70% in some cases. He referred to these cities as "migrant cities, or clusters of villages, full of recent migrants from rural areas" (Robinson, 1961:231). Other reasons posited for the small urban-rural fertility differentials were (1) greater reduction in infant and child mortality in urban than in rural areas, and (2) selective migration.

Using means and multiple regression for survey data of 6 Brazilian cities, Iutaka, Bock and Varnes (1975) found that fertility varied between native urban residents and migrant urban residents, with the

former having lower fertility and forming a more homogeneous group with respect to selected characteristics than the latter. Also, fertility of migrants depends on (a) age of arrival in the city and length of stay in the city, and (b) the area, especially the size of the area, from which one is migrating.

Urban residence is also said to result in a declining utility of children as productive assets, even to the extent where they become economic liabilities (Kasarda, 1971; Concepcion, 1974; Tsui and Bogue, 1978). Compulsory education for children, special and often costly child care, plus the increased opportunity for female employment, are some of the direct and indirect monetary, temporal and opportunity costs of children. In fact the above is the basic premise upon which most of the economic theories of fertility are based.

Thus urban areas generally tend to have lower birth rates than rural areas. In Jamaica, Roberts (1968) found the completed fertility of mothers 45-54 years, in the urban region centred around the capital city to be 4.59 while in the rural west it was 5.59. Colliver, Speare and Lui (1967) in Taiwan and Stycos (1968) in Latin America also found negative correlations between urbanization and fertility.

Birth control is a necessary factor in this urban-rural fertility differential. Greater use, especially of more effective contraceptives, in urban areas is well documented. Nortman (1977) records that the urban-rural ratios in contraceptive use is great in developing countries, for example in Colombia it is 35:19, in Thailand 70:42 and in Turkey 65:25. Part of this is due to the fact that urban areas have a higher concentration of contraceptive services and supplies.

As mentioned earlier, the pace of development in Trinidad and Tobago accelerated from the 1960s. Even though efforts have and are being made to decentralise, the primate city region of Port-of-Spain still has the greatest concentration of activities and opportunities. Thus the percentage of the population considered as urban increased from 59.6% in 1931 to 63.0% by 1970 (C.S.O. 1975). It is therefore necessary to assess what relationship, if any, exists between urbanization and contraceptive use/fertility. For 1931, the early period of development, Brawer (1965: 109) found a negative correlation (-0.42) between urbanization and the fertility of the general or non-Indian population. When control for male agricultural employment, illiteracy and female employment were added the correlation declined but still remained significant, -0.23. It would be interesting to see whether any changes have occurred in this relationship.

Measurement of Urbanization

A direct measure of urbanization, that is the percent of a ward's population residing in places defined as urban, was unavailable. Density will be used as a surrogate measure since urbanization is usually associated with higher densities or more persons per square mile or kilometre.

$$\text{Density} = \frac{\text{Population per Ward}}{\text{Area of Ward}}$$

INDUSTRIALIZATION

Industrialization is another important facet of modernization which is related to fertility and contraceptive use. It is generally closely associated with urbanization.

Modernization involves a shift from emphasis on a rural based primary, subsistence, household or familial type of economy to a more city based, commercial, and often capitalistic economy with special emphasis on developing the secondary or manufacturing sector. This new economic system necessitates a change in life style, attitudes and values. For example there is the separation of work from home since the factory rather than the family is the unit of production. Not only is there less time available for performing the parental role but extra provision must be made for child care. Large families therefore can prove to be more of a burden than an asset. Thus industrialization has generally been associated with lower fertility (Kasarda, 1971; Elizaga, 1974; Farooq and Tuncer, 1974).

In Trinidad and Tobago the industrial sector has been expanding at an annual rate of 11.2% (Hunte, 1976) as a result of the oil industry and also due to various government industrial development stategies, for example, tax concessions. As expected there is spatial differentiation in this industrial development, with greatest concentration in the south-west, centred on the oil belt and again in the north-west corridor, centred on the capital city. From a planning point of view it is therefore essential to know the direction and strength of the relationship between industrialization and fertility/family planning.

Measurement of Industrialization

For this analysis industrialization (IND) will be defined as the percentage of the total labour force engaged in manufacturing or production industries.

$$IND = \frac{\text{No. Employed in Manufacturing}}{\text{Total Employed}} \times 100$$

The range is from 16.00% to 57.21%.

FEMALE EDUCATION

Improved education for females is often posited as another important factor conducive to lower fertility and greater use of more effective contraceptives. In fact, with a few exceptions, general inverse relationships have been found between fertility and various measures used to represent female literacy or educational attainment.

Using regression analysis on subnational data for Turkey, Farooq and Tuncer (1974) found that the negative relationships between crude birth rates and female literacy remained relatively stable and substantial between 1935-1965. This led the researchers to conclude that "continuing modernization and the concomitant spread of female education will result in a continuing decline in fertility rate" (p.273). Other instances of negative relationships have been recorded by Colliver, Speare and Lui (1967) in Taiwan, Roberts (1968) in Jamaica, Goldstein (1972) in Thailand, Harewood (1975) in Trinidad and Tobago, and Caldwell, Caldwell (1978) in Nigeria. In fact, Flegg (1979) has predicted

that 10% reduction in illiteracy rate is likely to reduce birth rates by about 1.15.

Various reasons have been suggested for this depressing effect education seems to have on fertility. The more important ones will now be summarised.

(1) Increased education, especially at the secondary and post secondary levels, widens a woman's horizons and increases her aspirations for other gratifications in life apart from the satisfaction which children may bring [Friedlander and Silver (1967), Mueller (1972)].

(2) Increased education means more time has to be spent at school. This raises the age at marriage, especially away from the teenage years. Delayed marriage not only reduces the number of fecund years spent in marriage but it also gives the woman more time and opportunity to acquire other roles.

(3) Education has the potential for changing the traditional, fatalistic mode of thought to a more rationalistic one. Included here is also rationalization about the costs and value of children (Tsui and Bogue, 1978; Mueller, 1972). The quality rather than the quantity of children increases in importance. Also, in developing societies, increased education can place the population in closer contact with imported cultures and value systems including those relating to family size (Caldwell and Caldwell, 1978:7).

(4) Increased female education also has the potential for marriages to be more egalitarian than patriarchal. Scott (1967) reported that in Puerto Rico egalitarian marriages were more common where female education was higher. In such marriages, fertility was lower than in patriarchal marriages.

(5) Finally, education increases the woman's knowledge and use of contraceptives, especially the more effective ones. This, plus the fact that the subjective cost of unwanted pregnancies rises for the more educated, result in a narrowing of the gap between desired and actual fertility among this group (Janowitz, 1976:190). In Paraguay 47% of women with more than primary education were contraceptive users compared with 19% for those with lower education (Morris et al, 1978).

The following differentials were also noted in Table 6 of Nortman's (1977) study:- (a) In Mexico city only 5% of uneducated females compared to 47% of females with senior high school education were ever contraceptive users. (b) In Trinidad and Tobago the contraceptive use differential by education was also great. Thus 32% of the uneducated females, 37% of those with primary education, 48% with Junior high school compared with 64% of females with above Junior high school education were contraceptive users. Similar findings of positive relation between contraceptive use and education have been recorded in Fiji by Bavadra and Kiershi (1980).

Thus female education, operating either directly or indirectly, appears to be related to family size decline and differentials in contraceptive use. In Trinidad and Tobago the literacy rate has increased from 89% to 95% between 1968 and 1975 (Tsui and Bogue, 1978). Since 1962, the post Independence era, universal and free education has been given a tremendous thrust by the government. Not only have there been increases in the number of government and government-assisted primary and secondary schools but the locations have shown much decentralization. If, as this study will attempt to show, fertility is inversely

related to female education, then these improvements in education will be further assets to continued increases in contraceptive use and fertility reduction.

Measurement of Female Education

As was previously mentioned, it was impossible to obtain data on education at the ward level. Since this variable is of such importance it has been included in the study but in a separate analysis using a larger areal unit, that is the 9 county divisions. The major disadvantages here are: (1) Its comparativity with respect to the other variables will be limited. (2) Since it is in a separate analysis partial correlations cannot be used to determine the extent of its intercorrelation with the other modernization variables.

Again because of data constraints educational achievement is used for the female education (FE) variable:-

$$FE = \frac{\text{No. of Females 15+ yrs with Any Exam Passed}}{\text{No. of Females 15-44 yrs}} \times 100$$

This measure is representative of the female population with post primary and higher education. It is selective in that it excludes those who are thus educated but who have not passed any exams. The range is from 9.74% to 16.71%.

FEMALE EMPLOYMENT

Referring to the importance of female employment to reduced fertility Blake (1965) states that:

> Employment is a means of introducing into women's lives the subjective awareness of opportunity costs involved in childbearing - an awareness that traditional feminine roles and activities are well designed to circumvent (Blake, 1965:1195).

It is often advocated that government's development plans include provision for improving the status of women, for example via increased employment (Blake, 1965; Srikantan, 1977; Eberstadt, 1980). This is based on empirical evidence which generally shows that lower fertility and female employment are related[5]. In the long run reduced fertility would place less strain on limited monetary funds and consequently more effort can be channelled into investments and strategies which bring greater return rather than being channelled into low or no return provision of services to take care of high and ever-increasing population.

Brief mention will now be made of the salient points concerning this female employment-fertility relationship.

As a partial explanation for the complexity involved in and the sometimes cited lack of relationship between female employment and fertility the concept of role incompatibility was applied initially by Stycos and Weller (1967) and later by Weller (1968), Kasarda (1971), Kupinsky (1971) and Powell (1976) among others. Accordingly, when the woman's role as mother and her role as worker are compatible, for example where work and home may occupy the same location, as in agriculture or cottage industries, female employment would not be related to

---

[5] D. Powell's (1976) study of 'Female Labour Force Participation and Fertility - An Exploratory Study of Jamaican Women' gives a good review of literature.

fertility (Jaffee and Azume, 1960, in Japan). Conversely, when these two roles are incompatible, especially in urban industrial societies where work and home occupy separate locations, the woman is forced into a "zero sum game with tradeoffs between economic activities and family activities" (Kasarda,1971,307). Important points of consideration are the opportunity costs of raising children and income that will be foregone (Colliver and Langlois, 1960; Blake, 1965). These costs will be higher for the better educated and the better employed whose jobs provide greater monetary and non-monetary rewards. Thus lower fertility will be more common among those who choose extra-familial activities. However, parental surrogates can help to alleviate some of these conflicts.

It has also been suggested that a distinction should be made between the 'working mother' and the 'working wife' (Tiens, 1965; Terry, 1975). For the former, work is secondary to the role of mother. She generally works out of economic necessity. The working wife on the other hand is primarily a worker who takes time from work to bear children. Consequently, her fertility is lower than that of the working mother. These two concepts are also implicit in Pinelli's (1971) Italian study which found that lower fertility was more common among women who stated that they worked to gain independence or were interested in their work (working wives). On the other hand, fertility was higher among those who worked out of economic necessity (working mothers). Kupinsky (1971) applied this to socio-economic status and concluded that upper class women were more likely to be working wives who thus worked more for personal satisfaction than economic nesessity. Working mothers were more common among lower class women.

Other important reasons why lower fertility and female employment are inversely related are:

(1) Because a working woman contributes to the family budget, she is likely to be in a more companionate or egalitarian marriage, which is related to lower fertility and thus greater use of contraceptives (Ridley, 1968).

(2) Extra-familial employment places a woman in contact with more rational modes of thought (Kupinsky, 1971). Work provides the opportunity, monetary or otherwise, for greater participation in other extra-familial activities which compete with children for a woman's time[6].

(3) Because she spends a longer time acquiring an education and also because of the greater personal satisfaction her job/career may give, the employed female, especially the better employed, may either delay or even forsake marriage and/or childbearing. Consequently she is likely to plan and space births, which means greater and more effective use of contraceptives. Apart from finding that fertility in Latin America was negatively related to female employment Davidson (1978) found that age at marriage and female education were also important aspects in the relationship.

(4) Using Phillipine data, Rosenzweig (1976) advocates the use of a sequential model to determine the impact of female employment on fertility[7]. This approach is also implicit in the study by Groat, Workman and Neal (1976). Significant to the sequential decision making

---

[6] Namboodiri (1972:474) incorporates this and the former point into a causal model of demand for another child.

[7] For further use of this model see Boldt and Latif (1976). They advocate use of the sequential or interactionist approach when analysing fertility regulating behavior.

process is the fact that parents will alter decisions to have additional births or to work based on accumulated work experience, birth parity and other ever changing situations in life. Thus longer work duration, especially in higher status jobs, as well as work before first birth are "significant determinants of sequential decisions regarding market employment and fertility" (Rosenzweig 1976:355) which are associated with greater contraceptive use especially before first births and lower fertility.

Thus, whether operating directly or indirectly, female employment is yet another modernization variable of considerable relevance to fertility and contraceptive use.

Measurement of Female Employment

The following formula will be used to calculate the percentage of females who are employed per ward (FEMP):-

$$\text{FEMP} = \frac{\text{No. of Females Employed}}{\text{No. of Females 15-44 yrs}} \times 100$$

Since the data source does not give employment by age categories the numerator refers to all females, 15 years and over, who are employed. The range is from 4.50% to 32.03%.

CULTURE

Cultural variables have been receiving an increasing amount of consideration within the arena of fertility and fertility control. Coale et al[8] in reassessing the Demographic Transition Theory uses data for 700 European provinces. Though in the long run increased development and lower fertility coexist, yet the aspect of causality as hypothesised by transition theory remained questionable. An important finding in their reappraisal is that fertility levels correspond more to cultural and linguistic group characteristics than any other factor. In an analysis using regression technique on more international data, Janowitz (1971) expresses similar sentiments when she notes that "fertility rates will vary not only with level of development but will also be dependent upon a region's cultural heritage" (p.326).

Trinidad and Tobago is made up of a diversity of cultural influences. It is in fact considered the most heterogeneous society in the Caribbean region. It comprises a variety of ethnic and religious groups, family systems and mating relationships. When viewed from the perspective of Davis' and Blake's (1956) intervening variables - intercourse, conception and gestation[9] - this diversity has the potential for creating differentials in contraceptive use and fertility. For example under the 'Intercourse' variables, the East Indian woman's earlier age of entry into marriage and the non-Indian woman's greater

---

[8] Cited in (1) Population Reports Series J 12, 1976, pp. 231-214 and (2) Teitelbaum, 1975.

[9] Apart from Davis and Blake's (1956) detailed description of these intervening variables, Demerath (1976, pp.119-135) incorporates them into a Societal Model for Fertility Control where they mediate between primary institutions and fertility.

participation in less stable visiting and common law mating relationships can be important factors in the fertility differentials which in the past have been noted between ethnic groups in the country (discussed in greater detail later). Under the 'Conception' variables the Roman Catholic Church's proscription on the use of all but the natural means of contraception could result in higher actual fertility among Roman Catholics vis-à-vis other religious groups which place no such sanctions on contraceptive use.

Thus the varied cultural elements in the Trinidad and Tobago society could bear significant relationships to fertility and fertility control and so the inclusion of this section on cultural variables is fully justified. Three cultural variables which have shown most consistent relationship to fertility differentials have been selected. They are:

1. Ethnic Origin
2. Union or Marital Status
3. Religion

ETHNIC ORIGIN

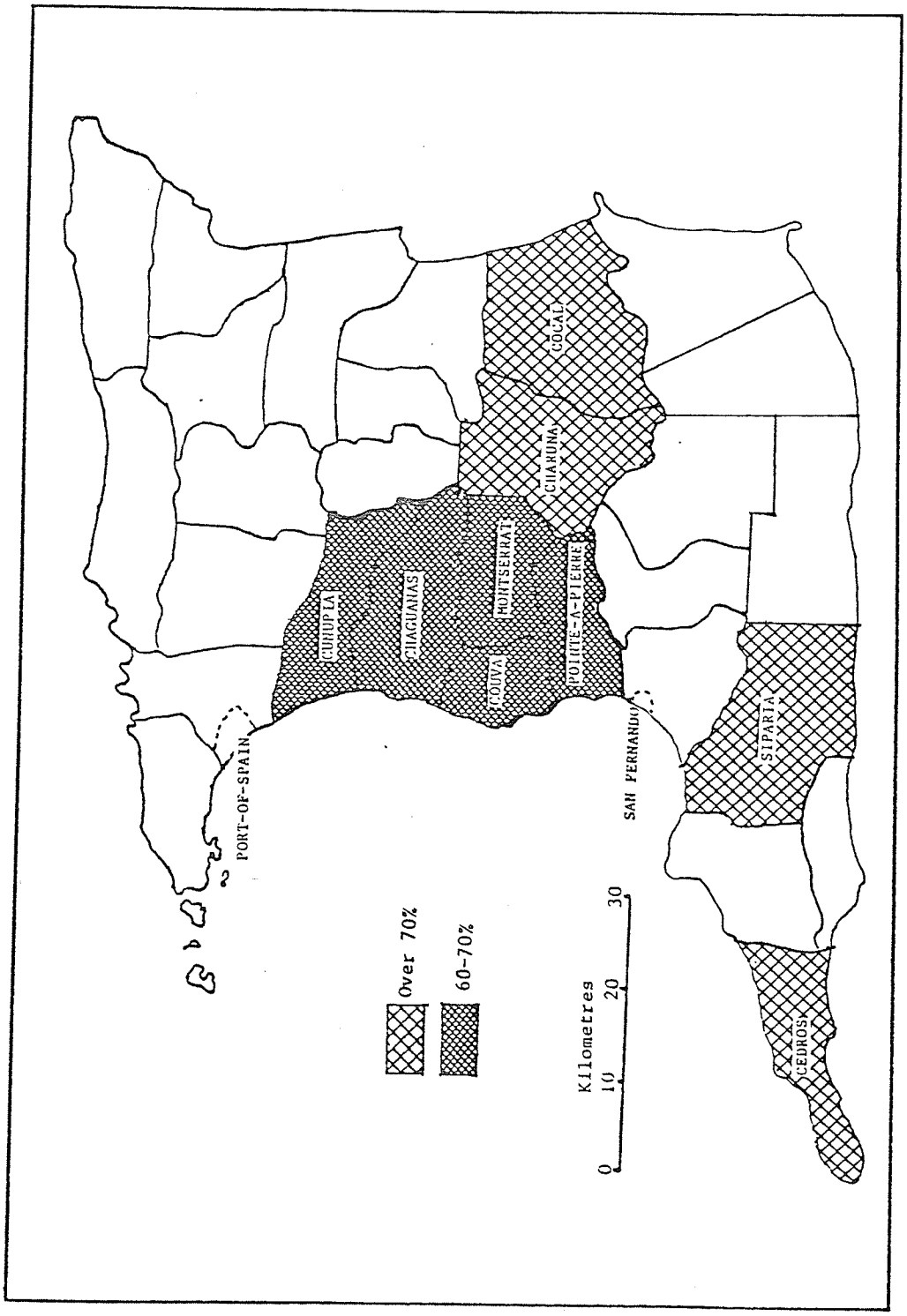
The importance of this topic of cultural diversity, especially ethnic diversity in Trinidad and Tobago, is well stated by Brawer (1965). He mentions that:-

> A major issue in analysis of many West Indian societies is social and cultural pluralism... Trinidad occupies a special position on this issue. Most authors, whether they emphasize 'pluralism', 'heterogeneity', 'diversity', 'acculturation' or class differences do accept a distinction between East Indians and all other groups in Trinidad (Brawer, 1965:16).

Trindad and Tobago is comprised of two dominant ethnic groups, Africans who were brought as slave labour for the plantations and East Indians brought in as indentured labour after the the abolition of slavery in 1838 and the African exodus from the land. These East Indians differed in dress, diet, religion, economic values and family systems. Among other factors, their geographic concentration in the agricultural belt in western Trinidad (Fig. 2.3) facilitated the maintainance of some of this Indian culture to the extent that they have advanced from being a 'cultural enclave' to form a powerful subculture or even "a parallel socio-cultural system within the total Trinidad society" (Brawer, 1965:20). As may be expected in such situations racial tensions have existed in the past. Since the post independence era and as a result of greater participation by Indians in the social, economic and cultural life of the total Trinidadian society and also due to some increase in intermarriages, there has been some changes in the racial situation.

Differences have also existed in the fertility patterns of both groups. Historically East Indians have always had higher fertility than the rest of the population. This is evident from the change in the racial balance over the years. In 1946, 35.08% of the population were East Indians and 46.86% Africans (C.S.O., 1975). The balance shifted by 1960 to 36.47% East Indians and 43.36% Africans and by the 1970 census 40.12% of the population were East Indians and 42.83% were Africans (C.S.O., 1975). That is, the East Indian population has been growing much faster than the African population, to the extent that the two groups are now almost on a par. This increase in the Indian population

Figure 2.3: EAST INDIAN CONCENTRATION



is due primarily to natural increase rather than immigration. For example, between 1919 and 1939 their birth rate per 1000 ranged between 35-40 and peaked at 48 in 1948. The rest of the population's birth rate per 1000 for a similar period ranged between 26-29 and peaked at 35 in 1948 (Brawer, 1965:42). Comparison of fertility ratios shows the same differentials. Thus in 1921 the East Indians' fertility ratio was 565 compared to 412 for the rest of the population. By 1946 the differential was 836 for East Indian and 555 for the non-Indian, principally African, population. Thus regardless of what measure used the East Indians' fertility has always been higher than that of the rest of the population.

Several factors can be put forward to explain the higher fertility of E.I. women. Briefly they are as follows:

(1) Earlier Age At Marriage

In the past Indian women entered marriage (usually arranged marriages) at much earlier ages, 14-17, than African women whose age at marriage averaged in the mid to late 20s. This meant that Indian women spent more of their fecund years in marriage and thus in the absence of deliberate use of contraceptives or subfecundity, they would have higher fertility.

(2) Higher Incidence Of Marriage

Marriage has been the most common mating relationship among Indian women. Thus by age 45, 97% Indian women compared to 66% non-Indian women are married (Roberts and Braithwaite, 1960). On the other hand the non-Indian women participated more frequently in other mating forms, for example visiting and consensual unions (discussed in greater detail

later). Because of the relative instability of these latter two unions, especially the visiting union, much reproductive time may be lost changing partners.

(3) Pronatalistic Religions

The majority of Indians (79.6%) belong to two non-Christian religions, Hindu and Islam, which place high value on procreation, especially of sons.

(4) Occupation

Once their indentured period was up most Indians chose to stay on the farm. In this type of occupation children are highly valued for the free labour they provide and so their economic value far outweighs their cost.

(5) Education

In the past the Indians' participation in the country's education system or institutions was at a minimal level, particularily among the females and those in the more rural areas. As mentioned earlier education has the potential to raise the status of women and give them more alternative roles than that of wife and mother.

Thus, historically, the Indians' closely knit family system, their way of life, religion and cultural values have been associated with much higher fertility than the rest of the population. It will therefore be interesting to see the extent to which ethnic origin is related to fertility/contraceptive use differentials in present day, more modernized Trinidad and Tobago where the Indian participates more fully in the every day life of the general society.

Measurement of Ethnic Origin

The ethnic variable is percent East Indians residing in each ward.

$$EI = \frac{\text{No. of Indians per Ward}}{\text{Total Ward Population}} \times 100$$

The range is from 1.57% to 83.08%.

UNION OR MARITAL STATUS

West Indian society, specifically the African element, has long been known for its diverse mating relationships or unions. Unlike most other countries, where the majority of births occur within legally sanctioned unions, that is in wedlock, in the West Indies, including Trinidad and Tobago, a relatively high percentage of births occur outside of marriage. In fact between 1880 and 1940 the illegitimate births for Trinidad and Tobago were 65% and 75% of all births (Harewood, 1975:189). In Trinidad 57% of all births between 1922 and 1944 were illegitimate (Brawer, 1965:56).

The illegitimacy rate for Trinidad and has been declining. This may be partly due to (a) the inclusion since 1946 of births to all persons married according to Hindu and Muslim rites (most of the Indian population) as legitimate whether or not such marriages were legally registered, and (b) the increase in the number of marriages among the non-Indian population, perhaps as one consequence of social and economic progress. For example, the illegitimacy rate dropped from 58% of total

births in 1946 to 43.5 % in 1960 and to 41.7% by 1970. Even so, as late as 1970, the most recent year for which census data were available, the percentage of illegitimate births was still high.

This high illegitimacy rate is indicative of the fact that sexual relations occur in unions other than legal marriage. Consequently, recognising that the usual dichotomy of marital status into married/single was inadequate for the full gamut of sexual relationships and also to legally recognise all children produced therein, since 1946 the government of Trinidad and Tobago has applied another, more effective typology which goes under the heading of 'Union Status'. The typology which has since been used for census taking as well as for other offical purposes is as follows:-

1. MARRIED This term applies when a man and woman cohabit and are legally married. This is the most stable relationship. In 1970 44.7% of females 15-44 years were in this union.
2. COMMON LAW Here the man and woman also share the same residence but are not legally married. In the 1970 census, 12.8% of females 15-44 years reported that they were in this union.
3. VISITING UNION Unlike the previous unions the man and woman do not share the same residence even though sexual relationship is implied by the union type. This is the least stable of the three unions.

Several causal factors, ranging from historical, cultural to socio-economic have been put forward in an attempt at explaining the origin and continued presence of such varied union forms in the Caribbean. This though is not the concern of the thesis. What is relevant here is

to identify (a) whether or not relationships exist between these different union forms and differentials in fertility and contraceptive use in present day Trinidad and Tobago, and also (b) the direction and strength of such relationships.

Generally, both in the Caribbean and Latin America, it has been almost consistently found that the most stable and permanent union, that is the married union, has the highest fertility. Conversely the least stable union, the visiting union, has the lowest fertility. Among the reasons suggested for these differentials by union status are:

(1) Since the partners in visiting unions do not share the same residence, sexual frequency may be more limited.

(2) Union dissolution is more frequent in the unstable unions. Consequently much reproductive time is lost between unions. A very valid point made by Ebanks (1973) is that the key issue is not union instability per se but rather the length of time spent between unions, since not always does the transition from one union to the next lessen the probability of conceiving. Referring to Jamaican data, he found that regardless of the "present union, the higher the number of partners, the higher the average number of pregnancies" (Ebanks, 1973:56). Despite this, though, when the number of partners was controlled the usual pattern of women in married unions having more children than those in common law unions remained. Visiting unions had the lowest fertility.

In Powell's (1976) and Denton's (1979) study, again with Jamaican data, female employment, union status and fertility were all related, although the nature and direction of causality remained uncertain. Of the three unions, women in married unions were least active in the

labour force and had the highest fertility while women in visiting unions showed the highest participation in the labour force and had the lowest fertility.

Using data for Trinidad and Tobago, Harewood (1975) also found lowest fertility among females in visiting unions. Whereas cross-tabulations of census data indicated that married unions experienced higher fertility than common law unions, the reverse was the case when data from a 1970 'Fertility and Family Planning Survey' were used.

It is therefore evident that differential fertility and contraceptive use exist between the three union types. The analysis will assess the extent to which certain mating unions are associated with higher or lower fertility and greater or less use of contraceptives.

Measurement of Union Status

The union or marital status variable is the percent of the female population in residential unions (RESU). This includes all females who are 'married' whether legally (married unions - MU) or consensually (common law unions - CLU):-

$$\text{RESU} = \frac{\text{No. of Females in Married and Common Law Unions}}{\text{No. of Females 15-44 yrs}} \times 100$$

The range is from 51% which occurs in the ward with the capital city, to 72%.

It is essential to ascertain whether the two residential or 'married' unions show similiarity in fertility and contraceptive use, or if one has higher actual fertility and less incidence of contraceptive use

than the other. Thus for comparative purposes the residential union will be divided into:

(a) Percent female population in legally married unions (MU). The range is from 31% to 56%.

(b) Percent female population in common law unions (CLU). Even though the average is 12.8%, the range is from 9% to 42%. The ward with the highest percent in married unions has the lowest percent in this union and vice versa.

RELIGION

The diversity of influences during colonization (French, Spanish and finally British), plus the diversity of ethnic groups (notably Africans and East Indians), have produced in Trinidad and Tobago, a multiplicity of religious denominations, both Christian and non-Christian. At the 1970 Census 69% of the population were Christians[10]. This was principally divided between Roman Catholics (35.6%), the largest religious group in the country, and Anglicans (18.1%). The remaining 15.3% of Christians were split between several minor denominations, with Presbyterian (4.2%) forming the largest. Non-Christians formed 31% of the population, with the division being between Hindus (24.7%), the second largest religious group, and Muslims (6.3%). About 99.8% of these non-Christians were East Indians whose representation in the Christian churches, principally Presbyterian and Roman Catholic, is small though on the increase.

---

[10] All statistics were taken from the Trinidad and Tobago Central Statistical Office (1975).

This religious differential has the potential for producing differentials in fertility and contraceptive use. This is so, since the various denominations can, by their doctrine and value systems, directly or indirectly influence their members on such issues like ideal family size, sex, contraceptive use and the importance of family life. Based upon these different attitudes the numerous religious denominations can be placed into one of three general categories.

(1) Non-Christian Both the Hindu and Islamic religions are pronatalistic. High value is placed on producing children, especially sons. Even so neither the Hindu nor Islamic religion explicitly prohibits contraceptive use. In Trinidad and Tobago this non-Christian group is almost totally (99.8%) an East Indian phenomenon. Thus, to avoid redundancy, non-Christians will be excluded from this section of the analysis. They have been indirectly included in the section on ethnic origin since the East Indians' attitude to family and children may generally be closely tied to religious values and doctrines.

(2) Christian:- Protestant These emphasise 'responsible parenthood'. Especially since the 1958 Lambert Conference of the Church of England, Anglicans in particular, and other Protestants to varying degree, have given full approval for voluntary birth control.

(3) Roman Catholic The Roman Catholic Church places high value on family life and on the family as a procreative unit. It now also advocates 'responsible parenthood' recognising that the "duty to procreate also includes the obligation to properly rear and educate children"

(Green, 1976: 66). Though it leaves the matter of actual or ideal family size up to parents it is however restrictive in its views on birth control. Accordingly and reiterated in the 1968 Papal Encyclical 'Humanae Vitae' every act of love or "marriage act must be open to procreation" (Baum in Callahan 1969:72). This therefore prohibits the use of any mechanical or artifical means of birth control, for example, the pill, sterilization and the condom, which impede the natural end of the sex act, that is, the transmission of life. Since life is highly valued and sacred, abortion and infanticide are also forbidden. Thus the only method of 'family planning' of which it approves is the natural means, that is rhythm or periodic continence. On this issue Pope Paul Vl in Humanae Vitae clearly states: "God has wisely disposed natural laws and rhythms of fecundity which, of themselves, cause a seperation in the succession of births" (Callahan 1969: 220). This has been endorsed by his successors Pope John Paul 1 (1979) and Pope John Paul 11 (1981).

Thus, of the three groups, and specifically in comparison with the Protestants, the Roman Catholic church is the only one which has such strong and explicit views on both procreation and contraception. It is therefore generally expected that affiliation would produce higher fertility vis-à-vis Protestants. Empirical evidence, though, shows conflicting results.

(a) Catholic countries, for example France and Spain, have also made the transition from high to low fertility. In fact France, a predominantly Catholic country, was first to begin the natality decline.

(b) On the other hand it is well documented that Roman Catholics in the U.S. have had higher actual and expected fertility than Protestants.

Recently though, there seems to be some indication that this religious differential in the U.S.A. is narrowing to the point where other factors, specifically socio-economic status, may be increasingly more important than affiliation to the Roman Catholic Church (Kupinsky, 1971; Cain and Weininger, 1973; Westoff and Jones, 1979). Jaccard and Davidson (1976) found that, even though Roman Catholics had higher actual and expected fertility than Protestants, there was no difference between the two religious denominations in intended use of oral contraceptives (p.336). They cite Westoff and Ryder's study where 60% of Catholics in the U.S.A. opposed the 'Humanae Vitae's' proscription of artifical birth control. This is similar to a report in Family Planning Today (1978) where 75% of practising Roman Catholic women surveyed in Britain, ages 16-34, were in favour of contraceptive use in marriage.

(c) In the 1960 Census of Trinidad and Tobago Roman Catholics had higher fertility than other Christians. Anglicans had the lowest. In a 1970 survey, Roman Catholics had the lowest fertility between ages 20-29 and highest between 30-44 (Harewood, 1975:181). Does this means a reversal of the usual trend of high Catholic fertility? The analysis should be useful.

Measurement of Catholicism

The religion variable is the percent of the total ward's population who are Roman Catholics (RC).

$$RC = \frac{\text{No. of Roman Catholics}}{\text{Total Population}} \times 100$$

The range is from 10.52% to 89.87%.

FAMILY PLANNING PROGRAM

One of the principal aims of this thesis is to locate factors which are related to greater contraceptive use. Thus, in addition to assessing the importance of modernization and cultural variables to the family planning user rate differentials, a variable more directly connected with the National Family Planning Program had to be included.

The reasons for the inclusion of this program input variable are two fold.

(1) The ensuing analysis will assess the extent to which program input is related to output (here the user rate) and consequently determine the program's success. Among the aims of the NFFP are the reduction of the national birth rate, the servicing of women of high parity and especially the poverty stricken. If program input can be shown to be related to the user rate the program has the potential for fulfilling some of its aims.

(2) The analysis is also designed to indicate the relative contribution made by the program input variable vis-à-vis the other variables, notably the modernization variables, to the family planning user rate.

With reference to fertility reduction, there are five schools of thought. They are the Naturalist, the Societalist, the Statist, the the Developmentalist and the Contraceptionist[11]. The two which have been widely accepted and which cause the most controvesy between proponents of each are the Developmentalist and the Contraceptionist (Blake, 1965; Eberstadt, 1980). The salient issue in this current debate will be outlined.

---

[11] See Demerath (1976) for more detailed description.

Developmentalist - Contraceptionist Debate

Developmentalist

'Development is the best contraceptive.'

This pronouncement made at the 1974 World Population Conference in Bucharest sums up the developmentalists' philosophy. Using transition theory as the base and further empirical evidence which seem to support the theory's basic hypothesis, developmentalists advocate that the best way to solve the problem of high and increasing population growth in the developing world is through socio-economic development.

Developmentalists refute the contraceptionists' approach to solving the population problem contending that fertility declined in the Western World without the existence of National Family Planning Programs. In fact in those countries fertility decline occurred through the use of traditional means of birth control, for example, coitus interruptus and abortion, rather than via modern means like the pill. Japan is one of the more recent and better examples of this. Once there is the necessary socio-economic development the desire for small family size will increase. At such time the population will seek and find ways and means of curbing their fertility even without the presence of family planning programs and their emphasis on more modern means of contraceptives. Consequently to the developmentalist, family planning programs are a waste of already limited funds which could be channelled into other higher return developmental schemes.

Contraceptionist

The contraceptionists advocate that governments in todays developing world must introduce specific public programs providing knowledge

and means of birth control if they are to make any strides toward fertility reduction, especially reduction at an accelerated pace. The following arguments have been advanced by the contraceptionists in defence of their approach, especially vis-à-vis the purely developmental one.

In the first place the contraceptionists contend that development, which the developmentalists claim is causally related to fertility, is proceeding at a very slow pace in much of the developing world. In fact the same high population growth which it is supposed to curb is impeding its progress. Thus the best strategy is to first try to reduce some of this restrictive population growth via family planning programs.

Secondly, though development is related to fertility the true causal nature is not quite certain. Also, there is no consistent threshold level of development associated with initial fertility decline (Eberstadt, 1980). Empirical evidence has pointed to the fact that in some cases the initial impact of development is either insignificant or even positive. For example, (a) better health care may reduce infertility and infant and child mortality, (b) development may break through traditional, cultural and/or religious beliefs which may have indirectly served to keep fertility in check.

Finally, empirical evidence shows that it is erroneous to believe (a) that knowledge of at least traditional means of birth control is universal, natural or automatic, and (b) that birth rates in the developing world are high because people want that many children (Population Reports, 1976). On the contrary studies have found that even in developing societies parents want and would or might have fewer children if they knew about birth control and had the means to practice it. Thus

the proponents of the contraceptionist approach argue that when governments provide family planning services and supplies the number of unwanted births will decline.

Two valid points of criticism can be laid against this latter approach when advocated as a separate policy for reducing fertility.

(1) This basically 'population-responsive' approach (Eberstadt, 1980) is too soft or weak when applied on its own, to do full justice to the immense population growth problem facing much of the developing world. Generally family planning programs advocate 'responsible parenthood' whereby parents are encouraged to have only the number of children they want. Yet parental desire and societal desire may conflict. Even though unwanted births are eliminated parents may still desire and have relatively large families. Thus family planning programs alone cannot really guarantee that there will be the required societal declines in fertility.

(2) A family planning program does not get to the root of the problem, it only cures the symptom. Thus by itself its potential is limited. It can only really succeed if the desire for much smaller family size already exists. It cannot create this desire. This is where development may be of importance. Certain development strategies can bring about institutional changes which place burden on large family size. Family Planning Programs will then be extremely useful in providing the means for actualizing this lower family size goal.

This issue of development and/or family planning programs has produced a wealth of research analysing the relative impact or contribution

of each approach to contraceptive use and/or fertility decline. Though many of these are academic exercises, policy directions are implicit aims. Three general findings will be mentioned.

(1) Though the aspect of causality is questionable yet empirical evidence has shown that most, if not all, developing countries which have experienced significant fertility declines have active family planning programs (Mauldin and Berelson, 1978; Eberstadt, 1980).

(2) Even though family planning programs do not initiate fertility declines yet in many cases their presence serves to accelerate the pace of the decline, for example in Chile and Trinidad and Tobago (Stycos, 1978). In most cases other factors, notably development, appeared to be more related to initial fertility declines. Yet, without the family planning programs these declines would or might have proceeded at a much slower pace. Jones (1977) notes that modernization made a significantly lower contribution to fertility decline in Barbados from 1960 to 1970, indicating the presence of another important factor. That other important factor she posited to be the Barbados Family Planning Program. Even in places where fertility decline and contraceptive use were evident before family planning programs, for example in Costa Rico (Stycos, 1978), they were still useful in further spreading contraceptive knowledge and supplies to a much larger proportion of the population.

(3) Others have found that the joint and interactive effect of family planning programs and modernization are in most cases more important than the independent contribution of each. For example, Srikantan (1977) uses several comparative studies at international, intra-regional (S.E. Asia) and intra-national (India and Taiwan) levels to assess the

impact of development and family planning programs on fertility. He concludes that

> A family planning program without significant social and economic change is not likely to make much progress or to have a large impact on fertility. Likewise, social and economic development is not likely to have a large and immediate impact on fertility decline if a formal program does not exist to make family planning information and service readily available to all segments of the population (p.327).

Though both family planning programs and development have independent effects of perhaps equal importance to fertility, yet their interactive effect is more important than either independent effect.

Mauldin and Berelson (1978) use various modes of analysis, for example regressions and cross-tabulations, in their examination of 'Conditions of Fertility Decline in Developing Countries - 1965-75'. They conclude that though on the balance family planning programs have a significant independent effect over and above the effect of socio-economic factors[12], yet,

> The key finding probably is that the two - social setting and program effort - go together most effectively... The joint analysis appears to 'explain' or 'predict' about 83 percent of the total variance in fertility decline (p.123).

Thus countries with both high social setting and strong family planning programs experienced much more substantial declnes in crude birth rate (30%) than countries with either family planning programs alone (20%) or favourable social setting but without family planning programs (5%). Where neither condition existed there was no decline in fertility.

---

[12] They included a section by Zenas Sykes whose finding is similar. Sykes found program effort produced a substantial decline in fertility (3 or 4 times that of social setting) while social setting produced only modest decline.

Thus generally both family planning and modernization appear to be important to contraceptive use and fertility in the developing world. This analysis will examine the independent and joint relationship modernization and a National Family Planning Program have with contraceptive use in the context of the Trindad and Tobago society. Since the modernization variables have already been selected, the family planning program input variable will now be given.

Measurement of Program Input Variable

The number of potential clients per family planning session (PC) is used as the family planning program input variable. These family planning sessions (hereafter referred to as sessions) are the periods of time specified at each hospital, clinic, health centre or office in each ward when contraceptive advice and supplies are given. In most cases these times coincide with maternal and child care with which the family planning program is integrated.

The number of potential clients (PC) per session has been devised as follows:

$$PC = \frac{\text{No. of Females 15-44 yrs}}{\text{No. of Family Planning Sessions}}$$

This measure could represent the extent to which there is crowding at the facilities. Crowding can reduce efficiency since not only may the staff be overworked but also prospective clients may be deterred by long hours spent waiting. Thus more sessions per unit of population, that is fewer potential clients per session, has a greater potential for attracting clients.

Alternatively, the raw number of sessions could have been used to indicate program input. But this total would not have reflected the variability of population size which may influence the amount of program input. By dividing the number of females in their fecund years (that is, potential clients) by the number of sessions some control is introduced.

It was also decided against using the number of clinics where family planning advice and supplies are given or potential clients per clinic as the program input variable. Neither of these bear any relationship to program input since the family planning program uses existing health facilities which were built for overall health care. The family planning program input is only introduced when specific times are allocated for family planning service.

Consequently, the number of potential clients per session is a very adequate representation family planning program input.

Chapter 3

CENSUS DATA - METHODOLOGY

METHODOLOGY

One of the principal aims of the thesis is to identify key variables which are related to greater contraceptive use and lower fertility. With the secondary data, correlation analysis, which is fairly popular in fertility studies, is therefore most appropriate since it is specifically designed for use in such descriptive and explanatory studies. Causality is not the concern here and so a more sophisticated and perhaps academically more aesthetically pleasing mode of analysis is not necessary.

Three stages of correlation analysis will be employed. They are zero-order correlation, partial correlation and multiple correlation. These are all well suited to the data available, the measurement level used and the hypothesis to be tested. As indicated in the previous chapter, all variables are measured in ratios or proportions where there is a standard interval and an absolute zero point.

Zero-order Correlation or Pearson's correlation is used first. This simple bivariate correlation will indicate whether or not two variables are related and the direction of that relationship, that is whether positive or negative. The correlation value gives the strength of the relationship since 0 specifies no relationship and +/- 1 specifies a perfect linear relationship. Thus this initial stage will be used to

identify and compare the relationship between (a) fertility and each modernization and cultural variable and (b) contraceptive use and each modernization, cultural and the program input variable.

Partial Correlation goes beyond zero-order correlation. With the use of one (1st level) or more (n levels) control variables the relationship previously shown in the zero-order correlation may either remain unchanged, be enhanced or disappear. That is, it indicates whether the relationship between two variables is spurious or not. Partial correlation will only be used where necessary.

Finally Multiple Correlation will be used:

(1) To show the relative importance of each set of independent variables in explaining fertility and contraceptive use differentials. Of special importance here is the joint and independent contribution made by the modernization and program input variables to the family planning user rate.

(2) To obtain the maximum overall proportion of variance, first in fertility and then in the family planning user rate, that is explained by a select number of variables.

The Statistical Package for Social Science (SPSS) computer program is used to obtain all correlations.

HYPOTHESES

Overall the analysis is designed to:

(1) Indicate whether the strength of the relationship between fertility and each modernization and cultural variable is similar to that between the contraceptive use and those same independent variables. If the

relationships are of similar strength then the family planning program may not be making a significant enough contribution to contraceptive use over and above that of modernization and/or cultural variables.

(2) Very importantly, the analysis will assess the importance of each set of variables, modernization, cultural and program input, in explaining differentials in the family planning user rate. Results could indicate the areas where effort should be channelled to make the family planning program more successful and efficient. For example, it could indicate whether it may have greater potential for success if more emphasis is placed either on increasing program input, or improving certain aspects of socio-economic development, or else increasing service to select cultural groups, or alternatively whether a mixed approach is more ideal.

Hypothesis 1:- Modernization

It is hypothesised that higher levels of modernization will be associated with lower levels of fertility. Specifically, a negative relationship is hypothesised between fertility and measures used to represent urbanization, industrialization, female employment and female education.

Fertility variations is generally a reflection of differential use of contraceptives. Therefore, barring subfecundity, or infertility, lower fertility represents greater use of contraceptives and vice versa. Thus, since fertility is hypothesised to be negatively related to the modernization variables, conversely, contraceptive use is hypothesised to be positively related to those same variables. Thus higher levels of urbanization, industrialization, female education and female employment are hypothesised to be associated with greater contraceptive usage.

(Note this is based of the assumption that there is no other external influence, specifically the influence of the family planning program, which can be of greater importance to the family planning user rate than modernization variables alone.)

Hypothesis 2:- Cultural Variables

Based upon the findings of past research, the following hypotheses will be made concerning the relationships between the cultural variables and fertility and contraceptive use.

(A) Ethnic Origin

Historically, fertility of East Indians has always been high, much higher than the other ethnic groups in the nation. Thus, the ethnic variable, here represented as percent East Indians per ward, is hypothesised to be positively related to fertility and negatively related to the family planning user rate.

(B) Union Status

(i) The percent females in residential unions is hypothesised to be positively related to fertility and negatively related to the family planning user rate.

(ii) When comparing married with common law unions, a stronger positive relationship is hypothesised between fertility and married unions than common law unions. Conversely, a stronger negative relationship between family planning and married unions.

(C) Religion

Affiliation to the Roman Catholic church is hypothesised to be positively related to fertility and negatively related to the family planning user rate.

Hypothesis 3:- Program Variable

As mentioned earlier this variable is only of significance to the family planning user rate.

(i) A positive relationship is hypothesised between the family planning user rate and the program input variable. This means that wards with more sessions per unit of female population, should have a higher family planning user rates, and vice versa.

(ii) The family planning program is designed to reach women who may not normally practise birth control. These would include (a) women with actual or the potential for high parity, (b) the poverty-stricken, and (c) those in rural or geographically remote areas. Thus if the program is fulfilling its aims, the program input variable should have a stronger relationship with the family planning user rate than the modernization and cultural variables.

Chapter 4

CENSUS DATA RESULTS

HYPOTHESIS 1:- MODERNIZATION

Fertility is highly and significantly correlated with each modernization variable. The correlations are also in the hypothesised direction, that is negative, indicating that higher levels of modernization are associated with lower levels of fertility. Table 4.1 shows the correlation coefficients between fertility and urbanization, industrialization and female education to be -0.726, -0.785 and -0.559 respectively. These are all significant at the .001 level.

Even though female education uses a different unit of measurement, it also correlates very highly with fertility, r = -0.755.

The various aspects involved in the modernization process are all generally assumed to be inter-related. Thus partial correlations were utilized to test the extent of the intercorrelation between the three modernization variables and so identify whether the above relationships are valid or spurious. (Since education used a different unit of measurement it could not be included.)

At the first level of partials the relationship between fertility and urbanization (-.726) is reduced only slightly to -.636 and -.591 respectively, when industrialization and female employment are controlled. At the second level though, when both variables are controlled simultaneously, the urbanization-fertility relationship declines more. The

TABLE 4.1

ZERO-ORDER CORRELATION

	FERT	C.U.	URBAN	INDUS	FEMP	E.I.	RESU	R.C.	PROG
FERTILITY (Fert)	1.000								
CONTRACEPTIVE USE (C.U.)	N/A	1.000							
URBANIZATION (Urban)	-.726	.335	1.000						
INDUSTRIALIZATION (Indus)	-.785	.029	.487	1.000					
FEMALE EMPLOYMENT (Femp)	-.559	.158	.594	.154	1.000				
EAST INDIAN (E.I.)	-.146	-.033	.045	.136	-.504	1.000			
RESIDENT UNION (Resu)	.657	-.012	-.501	-.535	.579	.427	1.000		
ROMAN CATHOLIC (R.C.)	.287	.057	-.103	-.339	.337	-.702	.053	1.000	
PROGRAM INPUT (Prog)	N/A	-.732	-.075	.184	-.036	N/A	N/A	N/A	1.000

correlation coefficient is now only -.363. However, this value is still at an acceptable (.05) level of significance, thus indicating that urbanization has an independent relationship with fertility.

Industrialization appears to have an even stronger and more independent relationship with fertility since controls for urbanization (-.719) and industrialization (-.854) or for both (-.800) do not make significant changes to the original zero-order coefficient of -.785.

Female employment shows an interesting deviation. When urbanization is controlled the original significant zero-order coefficient of -.559 between female employment and fertility is reduced to a low and insignificant value of -.231. Thus the original relationship between female employment and fertility is closely connected with urbanization. On the other hand, industrialization greatly enhances the female employment-fertility relationship to -.717. This again confirms the independent relationship industrialization has with fertility.

Family Planning Unlike fertility, urbanization is the only modernization variable which is significantly related to the family planning user rate (Table 4.1). Even so the correlation coefficient between the two is low, .335. It is much lower than the coefficient between urbanization and fertility. However, the relationship is in the expected direction, that is positive, indicating that urbanization is associated with greater contraceptive use.

The three other modernization variables, industrialization, female employment and female education, are not related to the family planning user rate since their very low correlation coefficients of .029, .158 and .181 respectively, are all at unacceptable levels of significance.

Partial correlations do not make significant changes to the above results.

Thus fertility and the family planning user rate differ quite considerably in their relationships with the modernization variables. Whereas the latter are all highly and significantly correlated with fertility, all but one show no relationship to the family planning user rate. Multiple correlation further emphasises this point. The multiple correlation coefficient between fertility and three modernization variables[13], - urbanization, industrialization and female education - is .916, while it is a mere .377 between the family planning user rate and those same variables. That is, whereas the modernization variables explain 84% of the variance in fertility, they only explain 14% of the variance in the family planning user rate. Most of this 14% comes from urbanization which alone explains 11% of the variance while the other two explain only 3%.

Before concluding this section, it must be reiterated that the family planning user rate only includes contraceptive users who attend the family planning clinics. Thus part of this low or lack of relationships between the family planning user rate and the modernization variables can be due to the fact the better educated, the employed and the better employed are using private or non-program outlets for their contraceptive supply. Thus with respect to the above findings, the following statements will be made: (a) The family planning program seems to be reaching most segments of the populaton since there are low or insignificant relationships between the modernization variables and

---

[13] Female education must be excluded since it uses a different unit of measurement.

family plannig clinic users. Especially important, here, is use by those groups who would not normally, consciouslly practise birth control. (b) At least, as far as clinic contraceptive use is concerned, factors other than modernization are related to differentials in contraceptive use.

HYPOTHESIS 2:- CULTURAL VARIABLES

A:- Ethnic Origin

The hypothesis that fertility is positively related to ethnic origin, here represented by percent Indians, has to be rejected. The correlation coefficient is at a very low (-.146) and unacceptable level of significance (>.05). Since the country is almost equally divided between Indians and Africans, an additional correlation between percent Africans and fertility was calculated for comparative purposes. Here too, the coefficent is low (.053) and insignificant. Thus ethnic origin, however defined, is not in any way related to fertility differentials.

This result though is not surprising. Many of the reasons cited earlier (Chapter 2) to explain the Indians' higher fertility vis-à-vis the rest of the population, either now exist to a much reduced degree or else no longer exist. Though still mainly concentrated in certain areas of western Trinidad, Indians are now well involved in the general modernization process. For example, they participate fully in the educational, employment (especially non-agricultural), economic and political institutions. Thus the younger Indian female is just as educated as her African counterpart. She seeks employment away from the home and/or

farm and is more independent. Age at marriage has increased, particularily away from the early teen years. These factors may prove to be more important to fertility levels than ethnic origin per se.

Family Planning Like fertility, the very low and insignificant correlation coefficient (.023) between percent East Indian and the family planning user rate indicates that these two variables are unrelated. There is the same lack of a relationship between the percent Africans and the family planning user rate. In neither case do controls for modernization variables significantly enhance results.

B:- Union Status

Fertility The results support the hypothesis that fertility is positively related to union status or percent females in residential unions (both legally and common law unions). The correlation coefficient of +.657 if fairly high and significant at the .001 level (Table 4.1).

For comparative purposes, residential status was broken down into its two constituent parts. Though both are significantly related to fertility, the direction and strength of the relationships differ. Unlike what was postulated, the coefficient for legally married unions is negative and low (-.365) though still significant, whereas it is positive and quite high (+.757) for common law unions. This may be indicating a halt or reversal in the past trend of higher fertility among married women than those in consensual unions.

Family Planning Unlike fertility, no significant relationship exists between the family planning user rate and the percent in residential unions (r = -.012), the percent in legally married unions

(r = -.109) and the percent in common law unions (r=.094). Therefore the hypothesis must be rejected. Factors other than union status are related to the differentials in the family planning user rate.

(C) Religion

The correlation coefficient between percent Roman Catholic and (a) fertility is +.287 and (b) the family planning user rate is +.057 (Table 4.1). These very low values are at unacceptable levels of significance (>.05), therefore the hypotheses that religion or affiliation to the Roman Catholic Church is positively related to fertility and negatively related to the family planning user rate must be rejected.

Thus union status is the only cultural variable which is related to a dependent variable and even so it is only related to fertility and not to the family planning user rate. The multiple correlation between fertility and the three cultural variables is .836. That means 70% of the variance in fertility can be explained when only these three cultural variables are used. Union status alone accounts for 43% of this explanation. On the other hand, the cultural variables can in no way explain the variation in the family planning user rate. The multiple correlation coefficient is an insignificant .064, that is less than 1% explanation.

HYPOTHESIS 3:- PROGRAM INPUT VARIABLE

This is the only variable to show a strong (r = -.732) and significant (.001 level) relationship with the family planning user rate

(Table 4.1). The family planning program input variable alone accounts for 54% of the variance in the family planning user rate. As postulated the correlation is negative, indicating that fewer potential clients per session (that is, potentially less crowding and less waiting time) is related to greater use of the facilities. There is a strong inverse relationship between program input and contraceptive use.

This program input variable is also independently related to the family planning user rate since no control variable, modernization nor cultural, makes any significant changes to the original r value of -.732. As a control variable, the family planning user rate enhances some of the values, for example between the family planning user rate and urbanization (+.412), common law unions (-.390) and religion (-.351).

SUMMARY

These results can be summarised as follows:

(1) The relationship between fertility and each of the four modernization variables is significant, high and negative. On the other hand only urbanization is related to the family planning user rate. Though it is in the hypothesised positive direction, the correlation coefficient is moderately low, +.335. Whereas all three modernization variables - urbanization, industrialization and female employment - explain 84% of the variance in fertility they only explain a low 14% of the variance in the family planning user rate.

(2) Union status is the only cultural variable to be related to fertility. No significant relationship is found between the family

planning user rate and any cultural variable. Thus, whereas together the three cultural variables explain 70% of the variance in fertility (43% for union status), they offer no explanation for the variance in the family planning user rate.

(3) Consequently, of the two sets of variables, modernization is more important to both fertility and contraceptive use than cultural factors. When put together, the six variables (three modernization and three cultural) explain a very high 96% of the variance in fertility but only 16% of the variance in the family planning user rate.

(3) The variable which, by far, produces the most significant relationship with the family planning user rate is the family planning program input variable. It is the only one to be highly correlated with this dependent variable. When this variable and the other six are included in multiple correlation analysis, it accounts for 54% of the total 67% explanation of the variance in the family planning user rate. This could mean that the National Family Planning Program is successful in its attempts to encourage women to practise birth control. It could also be indicating that one way to increase its success via contraceptive use is to put more into its program in the way of time and services.

PART III

SURVEY ANALYSIS

Chapter 5

SURVEY - METHODOLOGY

INTRODUCTION

During the months of December 1977 to April 1978 a Family Planning and Fertility Survey was conducted in Trinidad with the following objectives in mind.

The survey assesses whether spatial variations occur in fertility and contraceptive use. Of great concern here is the importance of family planning and the National Family Planning Program (NFPP). Thus, as well as tabulating the number or percentage of users, it is also essential to ascertain whether there are spatial (specifically urban versus rural) variations in contraceptive knowledge, attitude and in source of supply (public versus private). For example, inter-area differences, if any, in contraceptive knowledge can be an indication of the extent of the success or failure of the NFPP's Outreach and Information Service. These latter issues will be addressed in Chapter 7.

It is essential for the organisers of the NFFP to know more specifically who their target population should be. Thus the survey also aims at isolating those characteristics most related to high/low fertility and greater/lesser use of contraceptives. To this end select demographic, cultural and modernization variables, which in the past have shown most consistent relationships with fertility and thus with contraceptive use, are utilised. These have been described in Chapter 2.

Thus, if users display readily recognisable differences from non-users, by select characteristics, for example ethnic origin, religion, education and occupation, the results can be a helpful indicator of possible or required avenues for channelling input into the family planning program. This will be done in Chapter 6.

COMMUNITY SELECTION

Since one of the principal aims of the study is an assessment of spatial variation in fertility and specifically in contraceptive use, the approach had to be cross-sectional. Working under financial and temporal constraints it was decided to limit the survey to four representative communities. Great care was taken in selecting these communities. The following criteria of selection were used:

1) A Family Planning Clinic had to be located in or very close to the community. The National Family Planning Reports were used to assess clinic performance.

2) Each community had to represent one of the following urban-rural categories: (a) urban (b) semi-urban (c) rural (d) rural remote.

3) Finally, to arrive at a good cross country sample, geographic location was considered.

The following four communities were finally chosen (Fig. 5.1):

PORT-OF-SPAIN (POS)

This is the capital city and the urban representation. It is located in north-western Trinidad, in St. George's county. This is the most densely populated section of the island. (Fig. 5.2).

Figure 5.1: LOCATION OF THE SAMPLE AREAS

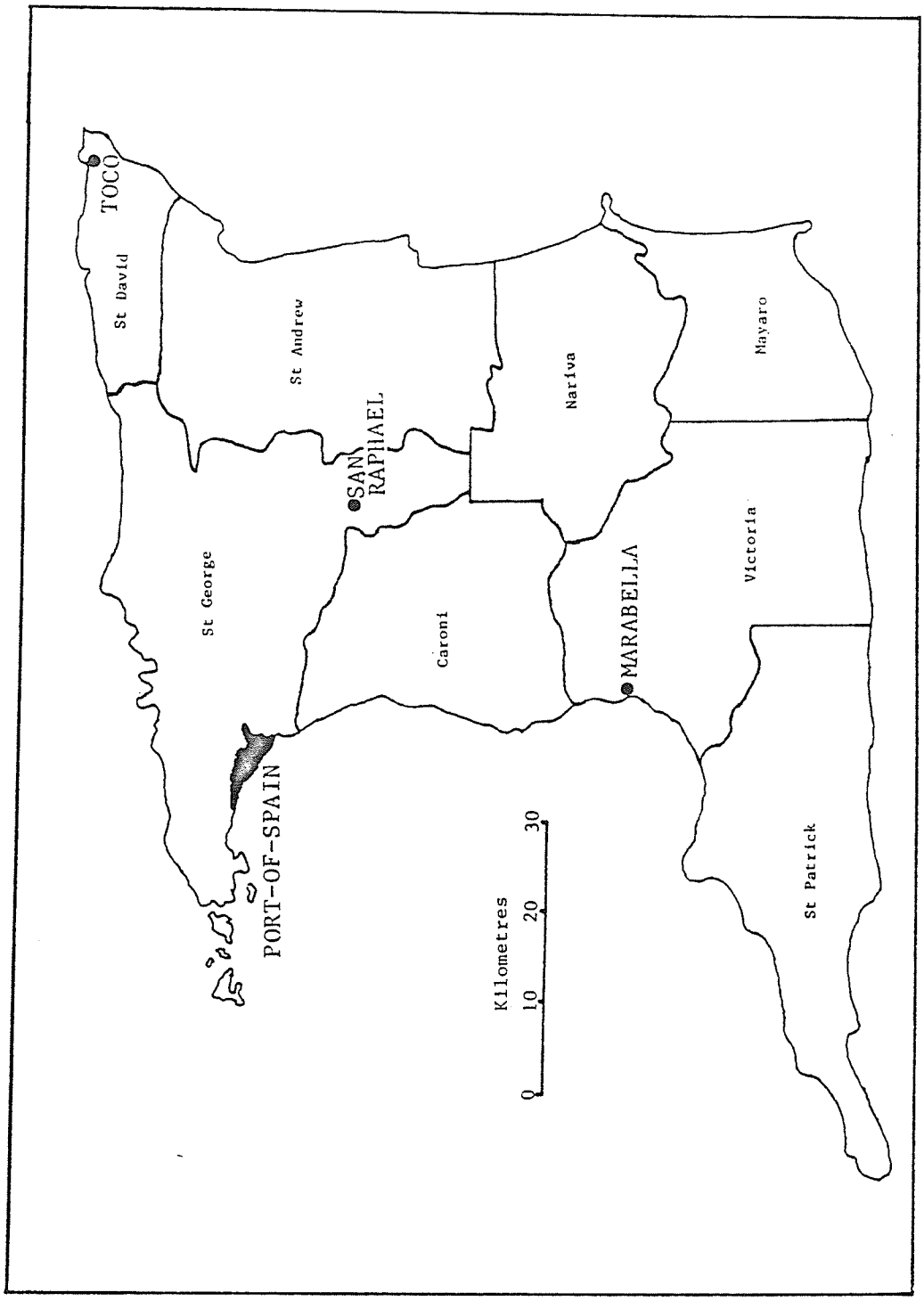
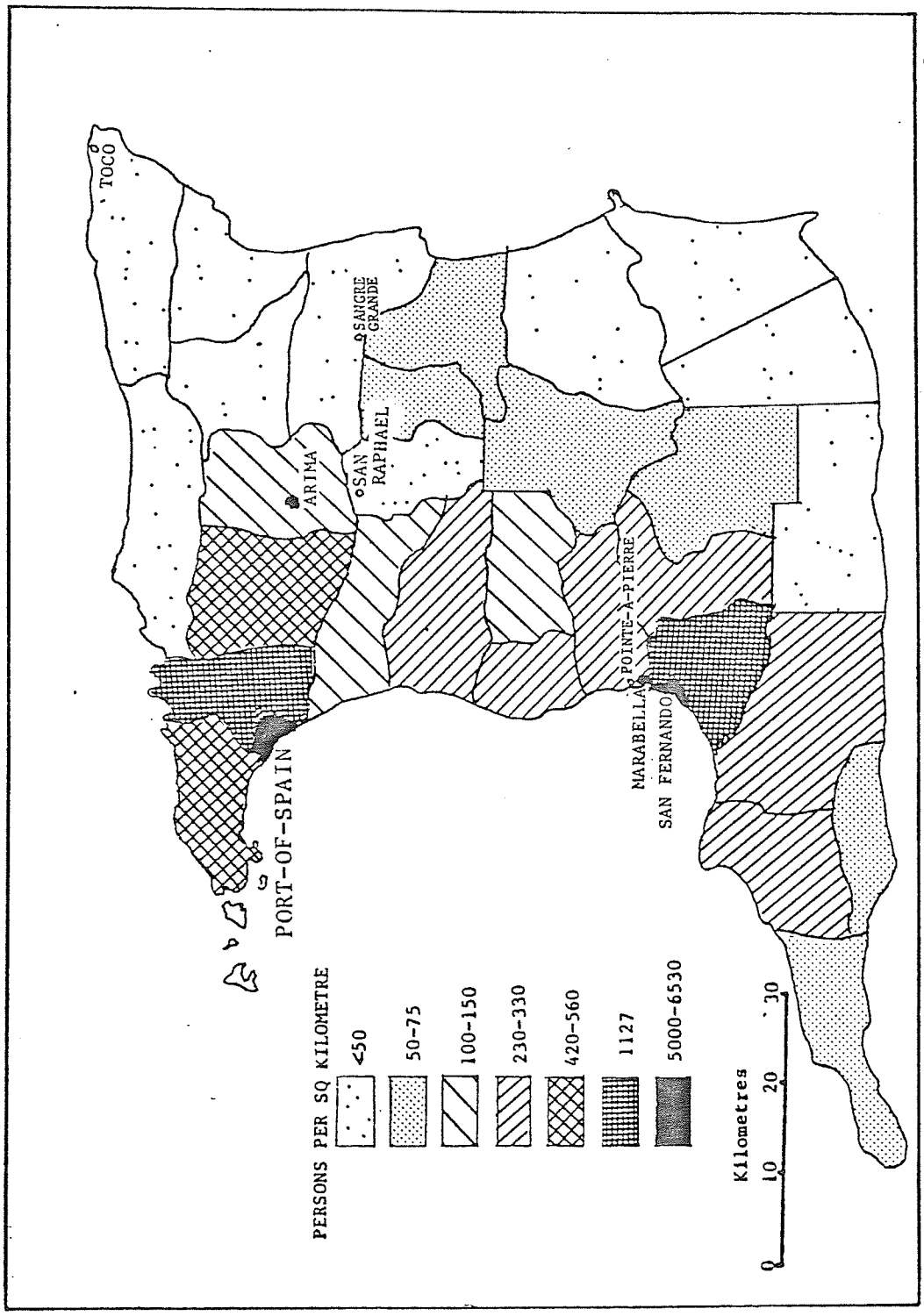


Figure 5.2: DENSITY BY WARD DIVISONS



This area has the highest concentration of family planning clinics. These serve both city and non-city dwellers. Port-of-Spain is the location for the only family planning clinic run by the Roman Catholic Church. The area's family planning clinic performance is good. There is also an abundance of private outlets, for example pharmacies, where contraceptive supplies like the condoms, spermicidal creams and the pill are easily available without prescription.

Port-of-Spain also has the heaviest concentration of commercial, industrial and service activities. Here, too, education, health and social services and facilities find their best expression. In fact, until recently it contained almost all of the nation's post primary educational institutions. Employment opportunities are also best here.

MARABELLA (MARA)

This is the semi-urban area. It is situated in close proximity to San Fernando, the second city. Like Port-of-Spain, Marabella is also located in the more densely populated western section of the country (Fig. 5.1, Fig. 5.2).

There is a family planning clinic in the area. Clinic performance is fair. Marabella's residents can also take advantage of the easily accessible family planning clinics located in San Fernando. This city also provides most of Marabella's heath, educational and social requirements. The Texaco Oil Refinery at Pointe-à-Pierre is very close to Marabella (Fig. 5.2) and so is a major source of employment for the male population.

SAN RAPHAEL (RAPH)

This rural area is in north-central Trinidad (Fig. 5.1). It is in one of the more sparsely settled wards (Fig. 5.2). A relatively good road network provides fairly easy access to neighbouring Arima, the third largest city, and also to the capital city, 32.2 kilometres away.

San Raphael has one health centre and so family planning services are integrated with maternal and child care. Attendance at the family planning sessions is fairly good, especially for a rural community.

There is one school in this community and it provides only primary level education. Higher education and all but minimal health care must be obtained at Arima or Port-of-Spain. Apart from agricultural employment and labouring activities, any other gainful employment must be sought outside the community.

TOCO

Toco is a rural and relatively remote village on the north-eastern extremity of Trinidad (Fig.5.1, Fig. 5.2). The village has a new hospital at which, once weekly, family planning services are integrated with maternal and child care. At the time the survey was about to be conducted family planning authorities were considering discontinuing their service since public response seemed poor.

Toco has one primary school and a recently built Junior High School. Thus, prior to mid 1970s, all post primary education, complicated or specialized health care and all social services had to be sought elsewhere. Even though road communication has been greatly improved and so the village is by no means isolated, it still takes about one half to one hour by car along a winding, mountainous road to get to

Sangre Grande, the nearest town. Port-of-Spain is approximately three hours from Toco. The bus service is not very good.

Fishing is of prime importance in this coastal village. Labouring is another important source of income. This includes working (a) on cacao, coffee or coconut estates, for example as fruit pickers, or (b) on the various Government Works Projects, for example road construction. Though the daily pay for the latter is much higher, it provides only occasional employment. Thus, within the village, there is a great scarcity of gainful year-round employment. A few of the young adults have elected to leave the village in search of employment and a better way of living. The majority have remained and generally are either under- or un-employed for part of the year.

SAMPLE SELECTION

Once the communities were identified, they had to be further defined. Census divisions provided the best available means for this and so each community was delimited in terms of enumeration district (ED) boundaries. Thus Marabella is represented by eight enumeration districts, San Raphael by three and Toco by four. Since Port-of-Spain is so extensive, a representative area is selected. The adjacent sections of two older communities, Woodbrooke and St. James, consisting of eight enumeration districts, are chosen to depict the urban area.

The sample frame, the Household List (1977)[14], gave the number of occupants per household by broad age categories (0-14, 15-65, 65+) and also by sex. Thus households with no females in the 15-65 age category were eliminated thereby reducing the number of households eligible for selection (Table 5.1). Since communities differed in terms of number of households, variable sample rates were used instead of a uniform rate. The sample sizes finally chosen were large enough to minimise sampling error while still being of financially and otherwise manageable sizes. Consequently for Port-of-Spain the sample size was 171 (20%) of the 855 eligible households. It was 236 (10%) for Marabella, 108 (40%) for San Raphael and 110 (50%) for Toco (Table 5.1).

The selection of specific household units for the interview was not difficult since the sample frame listed households in order of appearance along major and minor transportation routes (roads, tracks and lanes). This lent itself well to systematic selection whereby houses were chosen at regular intervals as they occurred in the Household List. Of course the interval used was dependent on the sample size. This sampling technique was chosen to ensure a good geographic spread. A random starting point was selected for each.

---

[14] The List was updated just prior to the survey.

TABLE 5.1

COMMUNITY SAMPLE SIZE

	URBAN (POS)	SEMI-URBAN (MARABELLA)	RURAL (SAN RAPHAEL)	RURAL REMOTE (TOCO)	TOTAL
ENUMERATION DISTRICTS PER AREA	8	8	3	4	23
HOUSEHOLDS PER AREA	1007	3140	330	314	4791
ELIGIBLE HOUSEHOLDERS, i.e. WITH FEMALES 15-65 YEARS	855	2365	271	220	3711
HOUSEHOLDS SELECTED PER AREA	171	236	108	110	625
PERCENTAGE OF HOUSEHOLDS SELECTED	20%	10%	40%	50%	17%
FINAL SAMPLE SIZE ANALYSED PER AREA	114	211	86	92	503

QUESTIONNAIRE

The survey required asking questions of a very personal and sensitive nature. Hence it was decided against too lengthy a format. It seemed more advantageous to design a questionnaire that would be able to capture all the pertinent information yet still be concise enough so as not to lose the respondent's interest.

Mainly closed rather than open questions were asked. By definition, closed questions require structured responses and contain a number of mutually exclusive and exhaustive answers from which the respondent is asked to choose (Caldwell et al, 1970). They have many advantages over open questions. For example:

(1) They are less time consuming and demanding for the interviewer.

(2) The answer frame provided makes it easier for the respondent to reply to sensitive, personal or even unpleasant questions.

(3) Inter- and intra-group comparisons are easier since all respondents are given the same alternatives. With unstructured or open questions comparisons can at times be difficult since the range or scope of responses may be unlimited.

(4) Closed questions are easier to code and analyse.

A preliminary questionnaire was constructed and pretested. Only a few minor changes had to be made to the original. For example: (1) A question on husband's/male partner's income was subsequently excluded. Occupation was used as a surrogate for income. (2) The possible responses to the question on husband's education was reduced to: primary, secondary and/or University, and 'do not know'. (3) A question

requiring females to give their specific age was changed to a closed question where age would be given according to one of seven age categories.

The final questionnaire, given in Appendix A, is divided into two sections. The first (Q1-11) is designed to garner demographic and socio-economic information. Thus it asks for the respondent's age, religion, union/marital status, ethnic origin, education, employment status, occupation, as well as her husband's/partner's education and occupation.

Section Two contains questions relating specifically to fertility and family planning. The fertility questions (Q12-13) ask for the actual as well as the ideal/desired number of children. For the latter closed question, six possible choices were provided, five of which were non numerical, for example 'The number God gives her' and 'The number her partner wants'. These possible replies were based on results of past fertility surveys in Trinidad and Tobago as well as in the rest of the developing world. The reply should indicate whether a woman views childbearing as something that she can or cannot control (fatalistic versus rationalistic thinking).

Questions 14-24 are concerned with family planning. Thus they ask about: (a) knowledge, attitude and practise of birth control, (b) knowledge of the National Family Planning Program, (c) contraceptive method used, (d) source of contraceptive information and/or supply, (e) reasons for not practising birth control.

The interview concludes with two general questions. The first, Q22, is designed to discern whether or not the respondents feels that

there is any connection between some socio-economic problems and family size. The final question is meant to assess the various sources used to gain information about community, national and international events.

Interviewers

Because of the cost and also to maintain a high degree of consistency most of the interviews were conducted by the researcher. Two assistants, both experienced in the field and recommended highly by the Social Department of the Census Bureau, were employed. One did approximately one half of the households in Port-of-Spain and the other did one third of the interviews in Marabella.

Response Rate

This was a Family Planning and Fertility Survey, thus it was limited to females 15-49 years who were in a mating relationship whether extra-residential (visitor) or residential (consensually or legally married). Females classed as 'single' without a male partner were excluded since they were not at the risk of conceiving and so would not need to use contraceptives. The response rate was good, especially in the rural areas. Only about 2% to 4% of eligible females either refused to be interviewed or could not complete the questionnaire.

DATA ANALYSIS

An average of 80% of the selected sample sizes are used in the analysis (Table 5.1). The rest consists of households (a) without females 15-49 in a mating union (10%-12%), (b) where the prospective respondent either refused to cooperate or was unable to complete the questionnaire (2%-4%), and (c) where the eligible respondent was absent on several occasions during the period when the survey was conducted (2%-4%).

Data are coded and analysed with the Statistical Analysis System (SAS) computer package programs. Both dependent variables, fertility and contraceptive use, are subjected to two types of analyses. The first is more descriptive while the second is a test for statistical significance.

Fertility was coded as actual number of children per female. At the initial stage of analysis the raw fertility data are aggregated and averaged using the following formula:-

$$\text{Average Fertility} = \frac{\text{No. of Children in Area A, Group A}}{\text{No. of Females in Area A, Group A}}$$

In order to identify factors related to differential fertility, this averaging is done for each area and for each demographic, cultural and modernization variable. A thorough assessment is made of these inter-group average fertility statistics. Results are also presented in tabular form.

This analysis, though, is merely descriptive. Therefore to validate statements made concerning inter-group fertility differences, a

more sophisticated statistical technique is utilized in the second stage of the analysis. The choice of a statistical test was limited since some of the independent variables, for example, ethnic origin and religion, are only at the nominal level of measurement. Analysis of variance is deemed most appropriate in this context since its only measurement restriction is that the dependent or criterion variable be on an interval scale. Actual fertility, the dependent variable, fulfills this requirement.

Analysis of variance (ANOVA) is one of the most powerful and flexible techniques available to the social scientist. It is very popular among geographers and non-geographers alike.

Simply stated, ANOVA utilizes the concept of sum of squares to compare two sources of variance:- (1) The between group variance or the difference between sample means. (2) The within group variance or the amount of variation about each sample mean averaged over all groups (Silk, 1977). The resulting F statistic is the ratio of the mean sum of squares of these two sources of variance. This calculated F value is compared to the critical or tabulated F value for a specified level of significance and with the degrees of freedom for the two sources of variation. F calculated is significant if it is greater than F critical. In this instance, the null hypothesis of no variation must be rejected in favour of the alternate hypothesis.

Two way analysis of variance is used in this thesis. Thus two independent variables are treated in each model for possible association with the dependent or criterion variable, fertility. In each analysis, area of residence is one independent variable (Factor A) and one

demographic, cultural or modernization variable is the second independent variable (Factor B). Consequently, three null hypotheses are tested:-

(1) H_o - Fertility does not vary significantly with Factor A (area of residence.

(2) H_o - Fertility does not vary significantly with Factor B (demographic, cultural or modernization variables).

(3) H_o - Fertility does not vary significantly with the interaction of Factors A and B.

The .05 level of significance is used to accept or reject the null hypotheses. A rejection of the null hypothesis in favour of the alternate means that there is more significant variation in fertility between, than within, factors A, B and/or the interaction of factors A and B.

In this analysis fertility levels 6 through 14 are combined to form one class. However, no significant change in the results occur if fertility levels 6 through 14 are not combined.

Data are analysed by the GLM computer program which is one of the many statistical packages offered under the Statistical Analysis System (SAS). GLM is especially designed to compute F ratios when data are unbalanced.

Contraceptive Use Initially, inter-group contraceptive use is assesed on the basis of percentages. The following formula is used to calculate the percentage of contraceptive users:-

$$\text{Contraceptive Use} = \frac{\text{No. of Contraceptive Users, Area A, Group A}}{\text{No. of Females, Area A, Group A}} \times 100$$

These results are also presented in tabular form.

As with fertility, a more formal statistical test of significance is used in the second stage of the analysis. In this instance, the dependent variable, contraceptive use, is only at the nominal level of measurement. Thus a non-parametric test is used. Chi square, perhaps the best known and most widely used of the non-parametric tests, was the most appropriate choice.

Chi square utilizes absolute rather than relative frequencies. It calculates the sum of the mean squared deviation of the observed frequencies from the expected or theoretical frequencies. This expected distribution is based on the premise that there is no association between the characteristics being considered.

If the calculated chi value is smaller than the critical chi value for the specified level of significance, with N - 1 degrees of freedom, then the null hypothesis of no association is true and so it cannot be rejected. Conversely, if the calculated chi value is greater than the critical value at the accepted level of significance for N - 1 degrees of freedom, then the null hypothesis must be rejected. An acceptance of the alternate hypothesis would indicate that the variables under study are significantly associated.

The null hypothesis in this present analysis is that contraceptive use is not associated with each demographic, cultural or modernization variable. Once more the .05 level of significance is used.

The FUNCAT program, again under the SAS package, is utilised to calculate the chi statistics.

Chapter 6

VARIABLES RELATED TO FERTILITY AND CONTRACEPTIVE USE

DEPENDENT VARIABLES

FERTILITY

Fertility averages at a moderately low 3.03 children per female over the entire sample. However substantial differences do exist when community of residence is considered. As expected, the urban area of Port-of-Spain has the lowest fertility, averaging at 2.32 children per female (Table 6.1). From here it rises to 2.75 for the semi-urban area. It is highest in the two rural communities, where it averages at 3.82 children per female, that is, 3.39 for Toco and peaking at 4.27 for San Raphael.

TABLE 6.1

INTER-AREA AVERAGE FERTILITY

URBAN (POS)	SEMI-URBAN (MARA)	RURAL (RAPH)	RURAL REMOTE (TOCO)	ALL AREAS
2.32	2.75	4.27	3.39	3.03

This urban to rural increase in fertility is further confirmed by the frequency tables for actual number of children per female. The percentage of small families, that is with 0-2 children, is a high 63% in

the urban and 56% in the semi-urban areas. For both rural areas it is below one half, being 49% in Toco and a very low 39% in San Raphael. Conversely, the percentage of large families (over 4 children) increases from urban (13%) to semi-urban (20%) to rural (26% in Toco and 37% in San Raphael) areas.

Apart from the fact that fertility is related to area of residence, other noteworthy points are:

(1) The average fertility for the entire sample is relatively low, that is 3.03. This is lower than past figures.

(2) Overall, there is a relatively low percentage of families with a large number of children. For example, less than one quarter (23%) of the females have over 4 children and a very low 10% have over 6 children.

CONTRACEPTIVE USE

There are more contraceptive users than non-users in the sample. In fact 55.9% or 281 are users and 44.1% or 222 are non-users of any method of birth control (Table 6.2).

TABLE 6.2

INTER-AREA CONTRACEPTIVE USE

	URBAN (POS)		SEMI-URBAN (MARA)		RURAL (RAPH)		RURAL REMOTE (TOCO)		ALL AREAS	
	%	Abs	%	Abs	%	Abs	%	Abs	%	Abs
USERS	64.9	(74)	55.9	(118)	51.2	(44)	48.9	(45)	55.9	(281)
NONUSERS	35.1	(40)	44.1	(93)	48.8	(42)	51.1	(47)	41.1	(222)
TOTAL	100.0	(114)	100.0	(211)	100.0	(86)	100.0	(92)	100.0	(503)

Like fertility, current contraceptive usage shows an urban to rural gradation but now it is in the reverse order. It is highest in the urban area where 65% of its sampled population practise some form of birth control (Table 6.2). It drops to 56% for the semi-urban sample and 51% for rural San Raphael. The rural remote area, Toco, has the lowest percentage of users, 49%. However, except for the city, the percentage point difference between users and non-users is not great.

The succeeding sections will highlight those characteristics which are related to low or high fertility and contraceptive use or non-use. The intent is to isolate those groups of the population which need special consideration by the National Family Planning Program (NFPP).

INDEPENDENT VARIABLES

DEMOGRAPHIC VARIABLE

AGE

The age distribution of the sample is of prime importance. A heavy imbalance of females at particular age groups, especially at the youngest and oldest ages, could affect the level of the average fertility and contraceptive usage. This point is of special relevance to comparative or cross-sectional studies. For example, exceptionally low fertility in one area may be the result of a heavy imbalance favouring the younger age groups. Conversely, high fertility may be due to a concentration at the older age groups where more completed family sizes occur. With age as a control variable these idiosyncrasies are eliminated and thus more accurate statements can be made about inter-area differences.

In this sample, with the exception of ages 15-19, all other age groups are well represented cross-sectionally (Table 6.3). Only in the rural remote area of Toco is there some imbalance, with more representation at ages 15-19, 20-24 and 25-29 than at the other age groups.

TABLE 6.3

INTER-AREA AGE DISTRIBUTION

	URBAN (POS)		SEMI-URBAN (MARA)		RURAL (RAPH)		RURAL REMOTE (TOCO)		ALL AREAS	
	%	Abs	%	Abs	%	Abs	%	Abs	%	Abs
15-19	2.6	(3)	4.3	(9)	1.2	(1)	21.7	(20)	6.6	(33)
20-24	14.0	(16)	18.0	(38)	10.5	(9)	27.2	(25)	17.5	(88)
25-29	16.7	(19)	24.2	(51)	24.4	(21)	16.3	(15)	21.1	(106)
30-34	18.4	(21)	21.8	(46)	22.1	(19)	8.7	(8)	18.7	(94)
35-39	19.3	(22)	13.3	(28)	12.8	(11)	8.7	(8)	13.7	(69)
40-44	9.7	(11)	11.8	(25)	17.4	(15)	9.8	(9)	11.9	(60)
45-49	19.3	(22)	6.6	(14)	11.6	(10)	7.6	(7)	10.5	(53)
Total	100.0	(114)	100.0	(211)	100.0	(86)	100.0	(92)	100.0	(503)

Fertility - Age

A positive relationship between average fertility and age is evident from an examination of Table 6.4, Fig. 6.1. Thus the average number of children ever born per female is lowest (0.97) at the youngest age group (15-19). Conversely, it peaks (av = 4.91) at ages 45-49, which is the oldest age group and the end of the fecund period.

An outstanding feature of Table 6.4 is that for each area there is a very sharp rise in fertility from ages 25-29 to 30-35. The average difference is a moderately high 1.36 children with a range from 1.09 (Raph), 1.40 (POS and Mara), to a high 2.63 (Toco). This great

TABLE 6.4

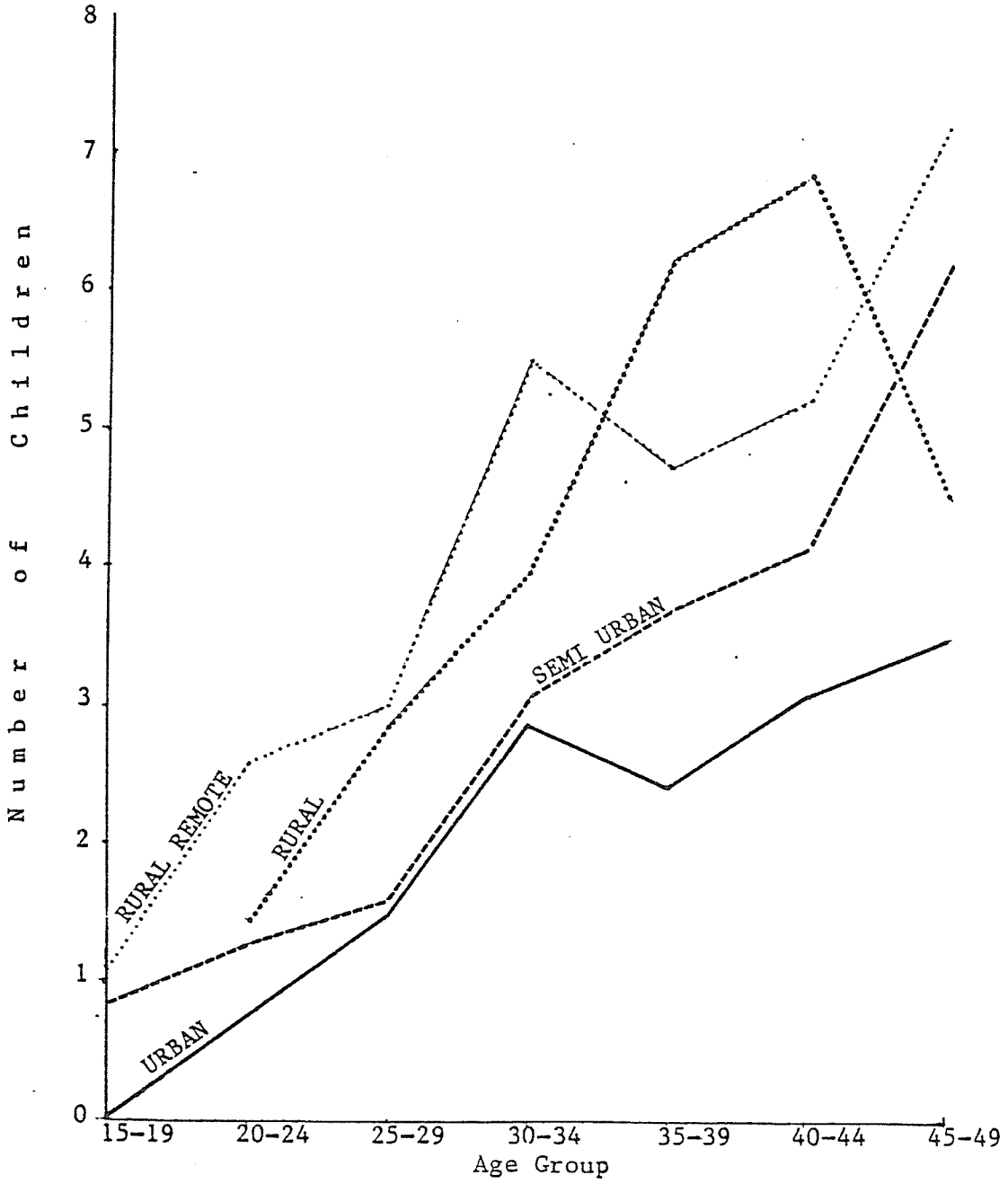
AVERAGE FERTILITY BY AGE GROUP

	POS	MARA	RAPH	TOCO	ALL AREAS
15-19	*0.00	*0.89	*2.00	1.10	*0.97
20-24	0.75	1.29	1.44	2.56	1.57
25-29	1.47	1.60	2.86	3.00	2.07
30-34	2.86	3.09	3.95	5.63	3.43
35-39	2.41	3.71	6.27	4.75	3.83
40-44	3.09	4.16	6.87	5.22	4.80
45-49	3.50	6.21	4.50	7.29	4.91

* - less than 5% of the area's population

disparity between these two age groups could be the result of the varied effects of the National Family Planning Program (NFPP) and an acceleration of economic development, both of which occurred in the latter half of the 1960s. When the NFPP began in 1967, that is approximately 10 years prior to this survey, the 25-29 age group would have just entered the fecund period and so the program, with its widespread provision of information and supplies, could have greatly affected their ability to control fertility. On the other hand, by the time the NFPP began not only would the 30-34 year old females have been well into the fecund period but many of them would have already borne children. Another possible reason for this disparity could be changing union (marital) status. Prior to age 30 the less stable, visitor unions are more common. After age 30 though, most females would have entered into the stabler residential unions, that is commonlaw or legally married unions. As would be seen later these two latter mating relationships are characterised by higher fertility.

Figure 6.1: AVERAGE FERTILITY BY AGE



A more accurate confirmation of this fertility disparity between the younger and older age groups could have been possible if data had been collected either for specific ages of all children or specific age of mother at each birth parity. Thus for example, it would have disclosed whether or not the age at which older women had a specific birth order is different from that of younger women.

Table 6.4 also confirms that the urban to rural fertility increase reported earlier is valid since inter-area fertility differences remain even when age is held constant. The differentials are especially large after age 34, that is at the middle and older ages. Again this may be related to the NFPP which may now be working towards reducing the inter-group and/or inter-area fertility gaps. For example females over 30 years entered the fecund period long before the NFPP's existence. Thus for them, contraceptive usage and consequently fertility would have been related more to conventional factors, like area of residence (urban versus rural) and education. At that time city women should have had greater access to information and supplies for practising birth control than women living in the rural areas. Once the Family Planning Program became widespread more females, especially in the rural areas, could have availed themselves of these services and supplies offered. This would therefore now reduce the fertility gap between urban and rural females, particular among the younger group.

The above statements can be verified by the use of a more sophisticated and rigorous statistical technique, analysis of variance. In this two way model, fertility or actual number of children born per female is the dependent or criterion variable while age and area of residence are the two independent variables.

An F value of 37.92 is calculated between fertility and age. Since this value is much greater than the critical F value of 2.12, at .05 level of significance, with 6 and 475 degrees of freedom (df), then the null hypothesis of no variation must be rejected. Acceptance of the alternate hypothesis means that fertility varies significantly between age groups. Significant variation in fertility is also evident by area of residence. In this case the F value of 15.81 is also above the critical value at .05 level of significance and with 3 and 475 degrees of freedom.

On the other hand, no significant variation occurs in fertility with the interaction of age and area of residence. The F value (1.25) is not at an acceptable level of significance. Thus, in this instance, the null hypothesis of no variance cannot be rejected.

Contraceptive Use - Age

The cross-tabulation of percentage contraceptive users by age produces the following results (Table 6.5):

TABLE 6.5

PERCENTAGE CONTRACEPTIVE USERS BY AGE GROUP

	POS	MARA	RAPH	TOCO	ALL AREAS
15-19	*66.7	*33.3	*	35.0	36.4
20-24	75.0	31.6	55.6	44.0	45.5
25-29	73.7	66.7	76.2	46.7	67.0
30-34	71.4	73.9	42.1	75.0	67.0
35-39	68.2	71.4	63.6	50.0	66.7
40-44	45.5	48.0	46.7	88.9	53.3
45-49	50.0	21.4	11.1	28.6	32.1

* - less than 5% of the area's population

Contraceptive use is lowest in the youngest (15-19, 20-24) and the oldest (40-44, 45-49) age groups. With few exceptions non-contraceptive users outnumber contraceptive users for each area. For the 15-24 age group there are an average of 43% users. The city has 74% users, the semi-urban area 32%, rural San Raphael 50% and rural remote Toco 40%. There are again an average 43% users among the 40-49 age group but now the distribution is 48%, 38%, 32% and 63% for the four respective areas.

Contraceptive usage is highest in the middle age groups (25-29, 30-34, 35-39). Here users consistently outnumber non-users by an average of 2:1. Usage declines from the urban (70%) and semi-urban (70%) areas to rural San Raphael (61%) and rural remote Toco (54%).

Thus the relationship between contraceptive use and age appears to be non-linear. It takes on an inverted U shape. The following reasons can be offered why this is so. Younger Age Group There is a higher incidence of the less stable, visitor or extra-residential unions, among the younger females. Because sexual contact may be limited, females may either fail to use contraceptives or do so only occasionally. The statistics do in fact show that for ages 15-24 non-users exceed users by an average of 2:1 among females in visitor unions. Added to this is the fact that the 15-24 age group is at the early stage of family formation and so may deliberately delay practising birth control until after the first child or until desired family size is reached. Older Age On the other hand many females at the 40-49 age group may have completed child bearing. Most gave their present 'old' age and the fact that they have not conceived in a number of years as reasons for their stance. Thus there is little or no need for them to practise birth control since

'nature' has already taken its course. Middle Age It is a quite different situation for females in their middle age, 25-39. Conception is a very high possibility, especially since many females are in stabler, potentially higher fertility mating relationships. Thus contraceptive use becomes a necessity (a) to keep actual and desired family size more compatible and/or (b) for child spacing.

In order to determine whether the above finding concerning the relationship between contraceptive use and age is statistically significant, chi square test is performed. This statistic, though, uses actual or absolute frequencies rather than relative frequencies as in the above analysis. Chi square assesses whether the observed frequencies are similar to, or statistically different from, expected frequencies. In this instance, the calculated chi-square value of 16.39 between contraceptive use and age is in excess of the critical chi value of 12.57 at the .05 level of significance with 6 degrees of freedom. Thus the null hypothesis of no difference must be rejected. Consequently, contraceptive use differs significantly by age group.

This test statistic, though, does not give any indication of the actual and intricate change in contraceptive use from one age group to the next. In this respect, the percentage tabulation (Table 6.5) is most useful since it indicates precisely which age groups have the most users (here the middle age groups) and which have the least users (here the youngest and oldest age groups).

CULTURAL VARIABLES

The analysis focuses on three cultural characteristics: ethnic origin, marital or union status and religion. In the past these have shown most consistent relationships with fertility and contraceptive use.

(1) ETHNIC ORIGIN

TABLE 6.6

INTER-AREA ETHNIC COMPOSITION

	URBAN (POS)		SEMI-URBAN (MARA)		RURAL (RAPH)		RURAL REMOTE (TOCO)		All AREAS	
	%	Abs	%	Abs	%	Abs	%	Abs	%	Abs
AFRICAN	26.3	(30)	43.6	(92)	18.6	(16)	88.0	(81)	43.5	(219)
INDIAN	24.6	(28)	42.2	(89)	60.5	(52)	3.3	(3)	34.2	(172)
MIXED	41.2	(47)	11.8	(25)	20.9	(18)	7.6	(7)	19.3	(97)
OTHER	7.9	(9)	2.4	(5)	0.0	(0)	1.1	(1)	3.0	(15)
Total	100.0	(114)	100.0	(211)	100.0	(86)	100.0	(92)	100.0	(503)

The overall sample is quite representative of the racial composition of the country[15]. There are 44% Africans, 34% East Indians, 19% Mixed and 3% Other (Table 6.6). The city has the highest percentage of females who stated that they were of Mixed origin (41%), while Africans (26%) and Indians (25%) were equally represented. The racial composition of the semi-urban area is closest to the actual for the entire country (1970 Census). Here, not only do Africans (44%) and

---

[15] In 1970 (Census) there were 42.8% Africans and 40.1% East Indians.

Indians (42%) dominate the sample (86%) but their share is almost identical. San Raphael has a predominance of Indians (61%), followed by mixed (21%) and Africans (19%). The rural remote community, Toco, is almost entirely (88%) African. There are only 3% Indians here. This is therefore a fairly good cross-section for ethnic origin.

Fertility -Ethnic Origin

The cross-tabulation of average fertility by ethnic origin (Table 6.7) indicates that the ethnic-fertility differences are generally low. In only one area is any difference over 0.50 (Table 6.7). Even though in both the urban and semi-urban areas Africans have lowest fertility and Indians highest, yet, the differences are small, all less than 0.50. In San Raphael the predominant group, Indian, has the lowest fertility. This is the only area with an ethnic-fertility differential over 0.50. Here Indians have an average 4.02 children per female while for Africans it is 4.88, that is a difference of 0.86. In Toco the Indian group is too under-represented to be included in the analysis. The 7.6% 'Mixed' have only 0.40 lower fertility than Africans whose fertility stands at 3.44.

TABLE 6.7

AVERAGE FERTILITY BY ETHNIC ORIGIN

	POS	MARA	RAPH	TOCO	ALL AREAS
AFRICAN	1.97	2.58	4.88	3.44	2.98
INDIAN	2.46	2.98	4.02	*3.33	3.22
MIXED	2.45	2.68	4.44	3.00	2.92

* - less than 5% of the area's population

These results remain unchanged when union (marital) status is held constant. When age is controlled though, some changes are evident. Thus (a) Except in POS, Africans have slightly higher fertility than Indians at the younger age group 15-29. The average difference is a moderately low 0.57. (b) At the older age groups, 35-49, Indians have much higher fertility than Africans. The average difference for the 40-49 age group is 1.03. This seems to indicate that the characteristically higher fertility among Indians may be at an end. It lends support to Harewood's (1975) hypothesis that the fertility gap between Indians and the rest of the population would be narrowed or even become non-existent in the future. He cites increasing education, especially among the Indian females, as a very important causal factor. In most instances, in this present survey, female education does in fact nullify any fertility differentials between Africans and Indians especially at the middle and younger ages.

Inter-area fertility differences are substantial even when ethnic origin is held constant. Urban fertility is lower than that of semi-urban and especially lower than that of both rural areas. For example, among Africans, urban females have an average 1.97 children, and semi-urban 2.58 (diff = 0.61). It peaks at 4.88 for rural San Raphael, which has 2.30 and 2.91 children more than the semi-urban and urban areas respectively.

Analysis of variance has been used as a statistical test of significance. Two way analysis of variance, utilizing fertility as the dependent variable and ethnic origin and area of residence as the two independent variables, produces the following results:-

(1) The null hypothesis of no fertility variation by ethnic origin cannot be rejected since the F ratio of 0.10 is extremely low and below unity.

(2) On the other hand fertility varies significantly by area of residence. The calculated F value of 10.44 is significant at the .05 level with 3 and 476 degrees of freedom.

(3) The interaction of both independent variables does not produce significant between group variation in fertility. F = 0.42 is not significant at the .05% level (6 and 476 df), thus the null hypothesis of no variation cannot be rejected.

Contraceptive Use - Ethnic Origin

From the tabulation of percentage contraceptive users by ethnic origin it is difficult to discern any consistent inter-area relationship between these two variables (Table 6.8). Thus for example, in the city each of the three ethnic groups has more users than non-users. Highest usage is among the 'mixed' group (70%) and lowest among Africans (57%). In Marabella though, Indians have highest usage (61%) and Africans lowest (47%). On the other hand Africans in San Raphael have greatest usage (81%) and Indians least (39%). Thus no one ethnic group has consistently highest or lowest usage.

The test statistic, here chi-square, does in fact support the above findings of no association between contraceptive use and ethnic origin. The calculated chi value of 1.02 is much less than the critical value of 5.99 for 2 degrees of freedom at the .05 level of significance. Thus the null hypothesis of no association cannot be rejected.

TABLE 6.8

PERCENTAGE CONTRACEPTIVE USERS BY ETHNIC ORIGIN

	POS	MARA	RAPH	TOCO	ALL AREAS
AFRICAN	56.7	46.7	81.3	46.9	50.7
INDIAN	67.9	60.7	46.2	*	57.0
MIXED	70.2	58.0	38.9	*71.4	63.9

* - less than 5% of the area's population

Before concluding this section on ethnic origin there is one more noteworthy point. Even though neither fertility nor contraceptive use is significantly related to ethnic origin, yet, when the cross-tabulation of average fertility and percentage contraceptive users are viewed simultaneously an interesting trend seems to be in effect. Generally in each community the ethnic group which has the highest average fertility also has the highest percentage of contraceptive users and vice versa. Thus for example, of the three ethnic groups in Marabella, Indians have the highest average fertility (2.98) as well as the highest contraceptive usage (61%), while Africans have the lowest average fertility (2.58) and the lowest contraceptive usage (47%). On the other hand, in San Raphael Africans have the highest average fertility (4.88) and the highest usage (81%) while Indians have the lowest average fertility (4.02) and the second lowest usage (46%). In Port-of-Spain, Indians and 'mixed' have the highest average fertility and the highest percentage of contraceptive users while Africans have the lowest average fertility and the lowest percentage of contraceptive users.

This is quite interesting and to the author's knowledge, has not been previously noted in research on fertility or contraceptive use in Trinidad and Tobago. Perhaps, the main reason for this omission, may be due to the fact that little or no attempt has ever been made to view fertility and contraceptive use simultaneously, as is the approach taken in this thesis. Generally, the concern has primarily been with the difference in fertility or the practise of birth control between the African and Indian populations per se. Yet, as noted here, even though there is no significant difference in fertility and contraceptive use by ethnic origin, the key finding appears when both dependent variables are viewed simultaneously. Thus to reiterate, inter-areally, greatest contraceptive usage is found among the ethnic group which has highest fertility and vice versa.

Though caution must be taken when interpreting or assessing this finding, the following comments will be made:- This trend gives strength to the hypothesis that, in present day Trinidad and Tobago, differential in fertility and contraceptive use is related to factors other than ethnic origin. In this instance high birth parity appears to be more important to contraceptive use than ethnic origin. This is so since, irrespective of ethnic origin, contraceptive use is highest among the group which has highest average fertility. When the NFPP first began, one of its principal target groups was these high parity women. These results are indicating that, at least in this context, the program may be achieving at least one of its goals. It would be interesting to see if this trend noted above persists in the future.

(2) UNION/MARITAL STATUS

In West Indian society, Trinidad inclusive, mating relationships occur outside of legally married unions with relatively high frequency (mentioned in detail in chapter 2). Therefore a three-part typology, under the rubric Union ('Marital') Status is used to encompass all females, legally married or otherwise, who are engaged in mating relationships and so may be at the risk of becoming pregnant. They are: (1) Visitor Union (VU)- where male and female do not live together, (2) Common Law Union (CLU)- where male and female share the same residence but are not legally married, and (3) Legally Married Union (MU).

On an average about two thirds of the sample are in legally married unions (Table 6.9). The highest percentages occur in the urban (73.6%) and the semi-urban (73.9%) areas. The rural remote area has the lowest percentage (35.9%) in married unions. This area, it must be remembered, has some concentration of its sample population at the younger age groups.

TABLE 6.9

FREQUENCY BY UNION/MARITAL STATUS

	URBAN (POS)		SEMI-URBAN (MARA)		RURAL (RAPH)		RURAL REMOTE (TOCO)		TOTAL	
	%	Abs	%	Abs	%	Abs	%	Abs	%	Abs
VISITOR	17.5	(20)	12.8	(27)	2.3	(2)	33.7	(31)	15.9	(80)
COM LAW	8.8	(10)	12.8	(27)	26.7	(23)	27.2	(35)	16.9	(85)
MARRIED	73.7	(84)	73.9	(156)	80.0	(61)	35.9	(33)	66.4	(334)
MISSING	0.0	(0)	0.5	(1)	0.0	(0)	3.2	(3)	0.8	(4)
Total	100.0	(114)	100.0	(211)	100.0	(86)	100.0	(92)	100.0	(503)

About one sixth of the total sample is in commmon law unions. The two rural areas have a much higher incidence of this consensual union (27%) than the urban (8.8%) and the semi-urban (12.8%) areas. Again about one sixth of the sample is in visitor unions. The rural remote area has a very high 37.7% in such unions.

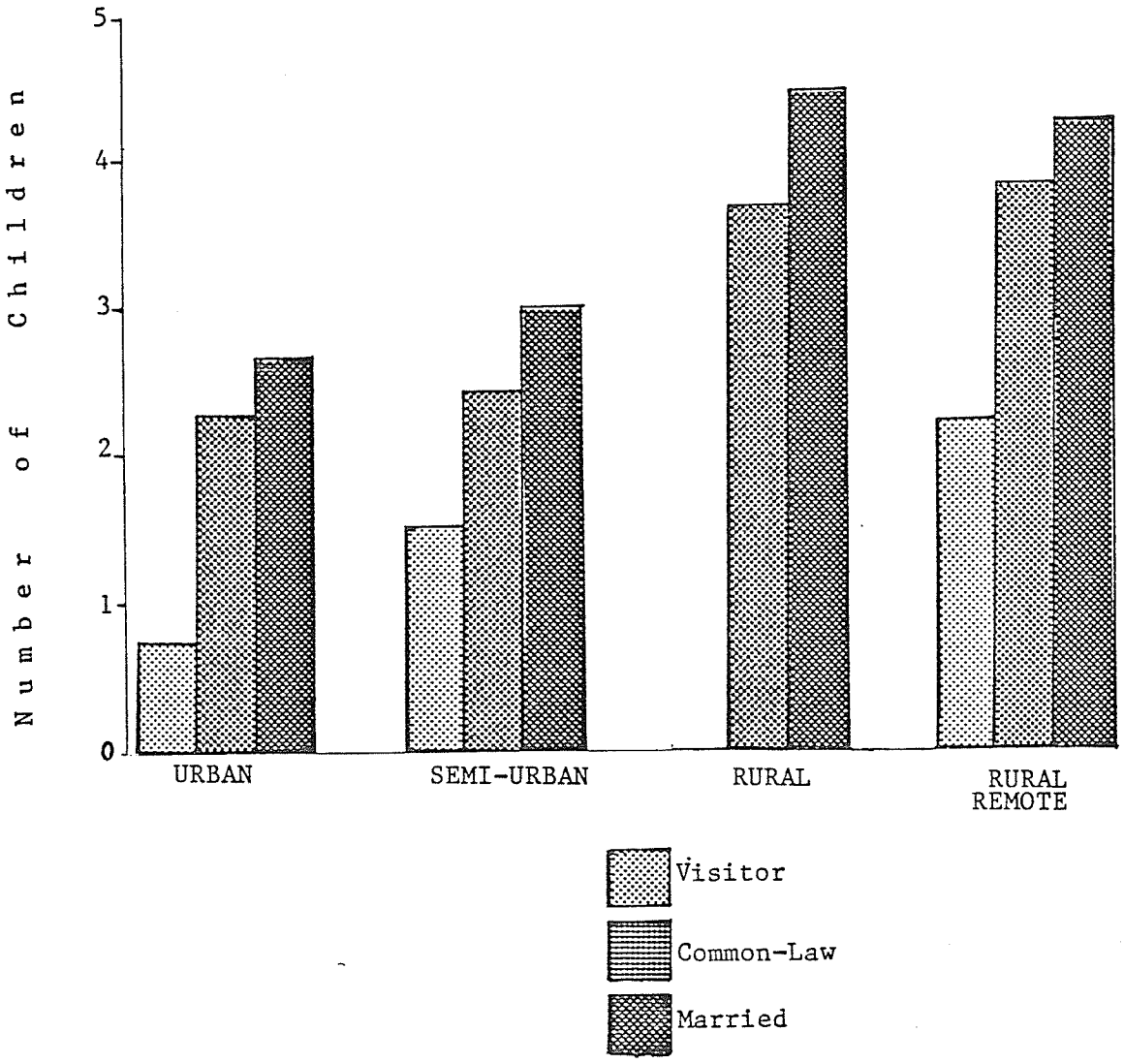
A higher number of vistor unions are found among the younger (15-24) age groups. On the other hand, a higher incidence of legally married unions are recorded at older age groups. Other researchers also have found more of the less stable, that is visitor relationships, at younger age groups and the stabler, legally married relationships at older age groups (Ebanks, 1973).

The sample also reconfirms the fact that non-legal unions are more a facet of the African rather than the Indian element of the society, especially for the older age groups. For example, 83% of the Indians versus 49% of the Africans are in married unions. 15% Indians versus 22% Africans are in common law unions and only 3% Indians versus 27% Africans are in visitor unions.

Fertility - Union Status

Initially, a thorough assessment is made of the cross-tabulation of average fertility by union status (Table 6.10). As expected the least stable union, visitor union, has the lowest fertility, averaging 1.68 (Table 6.10, Fig. 6.2). There is a great disparity between this group's fertility and that of common law (d = 1.50) and married unions (d = 1.64). Even so fertility of women in visitor relationships cannot be ignored. The group comprises over 10% of the sample and except for the city of Port-of-Spain where their average number of children is under 1,

Figure 6.2: AVERAGE FERTILITY BY UNION STATUS



that is 0.75, elsewhere it is relatively high. Thus it is 1.52 for semi-urban (Marabella) and a very high 2.23 for rural remote Toco where 37.7% of the females are in such unions.

TABLE 6.10

AVERAGE FERTILITY BY UNION STATUS

	POS	MARA	RAPH	TOCO	ALL AREAS
VISITOR	0.75	1.52	*	2.23	1.68
COM LAW	2.30	2.44	3.70	3.84	3.18
MARRIED	2.69	3.01	4.48	4.29	3.32

* - less than 5% of the area's population

After a very substantial gap average fertility of females in each of the two residential unions follows. Even though married unions display higher average fertility than consensual unions, the difference between the two is of little or no importance whatever, since nowhere is it at or above one child. Thus in Port-of-Spain and Toco the differences between marital fertility (2.69 and 4.29) and that of consensual unions (2.30 and 3.84) is very small. It is 0.39 for the city and 0.45 for Toco. In the remaining two areas the difference is 0.57 for Marabella and peaks at a moderate 0.78 for rural San Raphael. The average for the entire sample shows an extremely low and unimportant difference of 0.14, with marital fertility being 3.32 and consensual union only a slightly lower 3.18.

Analysis of variance, a more formal or rigorous statistical technique, is used to validate the above statements. Once again the model is

two way. In this instance though, union status and area of residence are the two independent variables.

In the case of union status, the calculated F value of 17.52 is significant at the .05 level with 2 and 487 df. Thus the null hypothesis must be rejected in favour of the alternate hypothesis which states that fertility varies significantly between union status categories. A significant F value of 11.76 (.05 level, 3 and 487 df) is also found between fertility and area of residence. This indicates that fertility varies significantly from one area to the next. On the other hand, the interaction effect, that is of union status and area of residence, on fertility, is not significant. The calculated F value of 0.51 is less than unity. Therefore, the null hypothesis of no variation due to the combination of union status and area of residence cannot be rejected.

The initial analysis which is based solely on averages indicates that while fertility differences between the visitor union and each of the two residential unions are substantial, no real difference is evident between common law and the legally married union. Once again analysis of variance is used to validate this finding. Two separate analyses are conducted with each using a two part classification of union status instead of the original three classes. (1) In the first analysis union status is reclassified into (a) visitor union and (b) residential union. This latter class is a combination of common law and legally married unions, the two unions in which the male and female partners cohabit. The F value of 34.11 is significant at the .05 level. Thus, as noted previously a significant fertility difference exists between visitor and residential unions. (2) The visitor union is left

out of the second analysis. Here the comparison is solely between fertility of the common law union and that of the legally married. The F value of 1.06 is not at an acceptable level of significance and so the null hypothesis cannot be rejected. This means that, as previously mentioned, no significant fertility difference exists between common law and legally married unions. Thus, it can be justifiably said that marital fertility is generally not significantly higher than that common law unions. Where differences do occur they not large enough to be of major importance. This finding is again quite similar to Harewood's (1975). The significant fertility difference noted in the original analysis of variance is mainly due to the disparity between visitor and each of the two residential unions.

Contraceptive Use - Union Status

Among females in visitor unions it is only in the city that the percentage of contraceptive users exceeds non-users (Table 6.11). Here 65% of females in this union stated that they were using some form of contraceptive. There is a general decline in users from the city to the rural areas. It drops to 41% for the semi-urban area and to a low 32% for the rural remote area, Toco.

Two points of interest to the visitor union are: (1) The percentage of women in this mating relationship is noteworthy especially in the rural remote sample where it peaks at 37.7%. (2) The fertility for this unstable union is relatively high, averaging 1.68. It is particularily high in the rural remote area (2.23). These two points take on special importance when it is noted that there are more non-users than users of contraceptives among women in this mating union. Once more, the rural

TABLE 6.11

PERCENTAGE CONTRACEPTIVE USERS BY UNION STATUS

	POS	MARA	RAPH	TOCO	ALL AREAS
VISITOR	65.0	40.7	*	32.3	45.0
COM LAW	40.0	51.9	43.5	44.0	45.9
MARRIED	67.9	59.0	52.5	66.7	60.8

* - less than 5% of the area's population

remote area of Toco deserves special mention. Of all the areas it has (a) the highest percentage of women in this union, (b) the highest average fertility for this union, yet (c) its contraceptive usage is very low. This suggests that there is an obvious need for the Family Planning Program to place more emphasis on reaching 'single' women.

Unlike fertility, the percentage of contraceptive users among females in common law unions is not much different from that of visitor unions. In both cases non-users exceed users. The spatial variation in the difference is not much.

Of the three union status categories married unions have the highest percentage of contraceptive users (av = 61%). It is only among this group that there is a consistent pattern of users outnumbering non-users in each community. It is 68% for the urban area, and declines to 59% for the semi-urban area and 53% for the rural communities of San Raphael and Toco. It must be remembered that this group consists of a large number of middle age women for whom contraceptives are required (a) for birth spacing and (b) especially to keep desired and actual family size more compatible.

Once more the test statistic, chi square, is in agreement with the above findings even though the latter uses percentages while chi square utilizes absolute values. The chi value for a possible association between contraceptive use and union status is 7.02. Since this calculated value is greater than the critical chi value of 5.99 for 2 df, at the .05 significance level, then the null hypothesis must be rejected. An acceptance of the alternate hypothesis means that there is a significant association between contraceptive use and union status. When only legally married women and those in common law unions are included in the analysis, the significant association between contraceptive use and union status is still in effect (chi square = 6.31). This, too, confirms the above finding that there is a substantial difference in contraceptive usage between women in these two residential unions.

(3) RELIGION

The various religious denominations differ in their attitude towards birth control and/or family size. On the one hand, some, principally the Roman Catholic Church, are especially prohibitive of any artificial means of contraception, and at the same time stress the importance of the procreation aspect of marriage and the sex act. On the other hand, there are those, like the Hindu and Islamic Churches, which place no such sanction on contraception but yet remain pronatalistic in their doctrine. Finally there are the Protestants, specifically the Anglican Church, which stress 'Responsible Parenthood' and to this end, approve of the voluntary use of birth control. Thus, theoretically, one would expect differentials in fertility and/or

contraceptive use to exist between members of the different religious denominations. Globally, with a few exceptions, this has been so in the past. For example in the U.S.A., it has been common for Roman Catholics to have higher fertility than Protestants, the same too in Trinidad (Census 1960, 1970). Fertility in Hindu and Islamic countries has always been high.

Trinidad and Tobago is heterogeneous in its religious composition. At the 1970 census, 69% of its population were Christians, with 36% belonging to the Roman Catholic Church. Of the 31% non-Christians (99.8% Indians), Hindus (25%) far outnumber Muslins (6%). Thus with such a diverse religious composition it would be interesting to see the extent to which religious differentials, especially between (a) R.C. and Protestants (b) Christians and non-Christians, are related to fertility and contraceptive use.

The questionnaire specified six categories for religion - Roman Catholic, Anglican, Other Christian, Hindu, Muslim and None. These were subsequently regrouped into three classes - Roman Catholic, Protestant and non-Christian. A frequency table based on this new classification is given below (Table 6.12).

The overall composition of the sample population is much like that of the total population. The Roman Catholic group is generally the most represented of any single denomination. It ranges from 29.4% (Marabella) to 58.8% (POS) with an average of 41% for the entire sample. The non-Christians are only well represented in those areas with a high Indian population, that is in Marabella and San Raphael. The latter has the highest percentage of Indians (60.5%) and the highest percentage of

TABLE 6.12

INTER-AREA RELIGIOUS COMPOSITION

	URBAN (POS)		SEMI-URBAN (MARA)		RURAL (RAPH)		RURAL REMOTE (TOCO)		ALL AREAS	
	%	Abs	%	Abs	%	Abs	%	Abs	%	Abs
ROMAN CATHOLIC	58.8	(67)	29.4	(62)	46.5	(40)	40.2	(37)	41.0	(206)
PROTEST	33.3	(38)	45.5	(96)	16.3	(14)	57.6	(53)	40.0	(201)
NON-CHRISTIAN	5.3	(6)	24.6	(52)	33.7	(29)	1.1	(1)	17.5	(88)
NONE	2.6	(3)	0.5	(1)	3.5	(3)	1.1	(1)	1.5	(8)
Total	100.0	(114)	100.0	(211)	100.0	(86)	100.0	(92)	100.0	(503)

non-Christians (33.7%). Just over half of the Indians there are non-Christians. Marabella has the second highest percentage Indians and non-Christians. Port-of-Spain and Toco each has less than 10% non-Christians.

Fertility - Religion

The cross-tabulation of average fertility by religious affiliation yields the following results (Table 6.13): Generally Roman Catholics' fertility is either not substantially different from or else is surprisingly lower than that of the other two religious categories. In both Port-of-Spain and Toco, where non-Christians are too under-represented to be included in the analysis, the fertility differences between the two remaining groups, Roman Catholics and Prostestants, are too small, 0.21 and 0.22 respectively, to be of any consequence. In Marabella and

San Raphael, where all three religious groups are well represented, the following trends are evident: (1) Roman Catholics have lower fertility than both Protestants and non-Christians. It averages:- (a) 0.83 (Mara) and 1.07 (SR) less than non-Christians and (b) 0.90 (Mara) and 1.10 (SR) less than Protestants. (2) In both areas the average number of children per Protestant and non-Christian female, respectively, is quite similar. (3) The same lack of a substantial average fertility difference is noted between Christians (R.Cs. and Protestants) and non-Christians.

TABLE 6.13

AVERAGE FERTILITY BY RELIGION

	POS	MARA	RAPH	TOCO	ALL AREAS
ROMAN CATHOLIC	2.21	2.13	3.83	3.57	2.74
PROTESTANT	2.42	3.03	4.93	3.30	3.12
Non-CHRISTIAN	2.50	2.96	4.90	*	2.80

* - less than 5% of the area's population

Despite these intra- and inter-area variations when the total sample is viewed (col 5, Table 6.13) the fertility differences are almost non-existent since in all instances it is much less than 0.50. The differences between (a) R.Cs and Protestants is a low -0.38, (b) R.Cs and non-Christians a mere -0.06 and (c) Protestants and non-Christians, +0.32.

Analysis of variance indicates that there is no significant fertility variation when either religious affiliation or the interaction of religious affiliation and area of residence are used as the independent

variables. In both cases the F values of 2.20 and 0.57 respectively, are at unacceptable levels of significance for their respective degrees of freedom. Thus, it can be justifiably said that religious affiliation is not in any related to fertility.

When religion is controlled there is a substantial urban to rural rise in average fertility (Table 6.13). Analysis of variance also validates this finding. The F value of 12.37 between fertility and area of residence is significant at the .05 level with 3 and 483 degrees of freedom. Therefore the null hypothesis must be rejected in favour of the alternate which states that fertility varies significantly by area of residence.

Contraceptive Use - Religion

The cross-tabulation of contraceptive use by religion shows that the two are unrelated. Thus Table 6.14, which summarises these results, indicates that:-

(1) Generally for each respective area (col 1-4) and specifically for the entire sample (col 5), contraceptive users outnumber nonusers for each religious category. In some places this is by a much larger percentage, for example, 72% of Roman Catholics in the city are users.

(2) In the two instances where non-users exceed users, the difference is generally too small to be of importance. Thus in Toco 49% or 18 Roman Catholics are users compared to an almost equal 51% or 17 non-users. Among the 29 non-Christians in the San Raphael sample, 12 are users and 17 non-users, that is a difference of only 5 females.

These results are further validated by the chi-square analysis which uses absolute values rather than percentages. The chi-square test

TABLE 6.14

PERCENTAGE CONTRACEPTIVE USERS BY RELIGION

	POS	MARA	RAPH	TOCO	ALL AREAS
ROMAN CATHOLIC	71.6	58.1	52.5	48.6	59.7
PROTESTANT	52.6	52.1	71.4	50.9	53.2
Non-CHRISTIAN	66.7	59.6	70.6	*	53.4

* - less than 5% of the area's population

shows that religious affiliation is not significantly associated with contraceptive use. The chi value of 0.92 is less than unity. This indicates that the difference between observed and expected cell frequencies for contraceptive use/non-use by religious affiliation is very small. The null hypothesis of no difference therefore cannot be rejected.

One more noteworthy point must be mentioned before concluding this section. Interestingly, even though the Roman Catholic Church is against any artificial means of birth control, yet when religion is cross-tabulated by contraceptive method (Table 6.15) the results show that Roman Catholics are just as likely to use Catholic-proscribed methods as non-Catholics. For example, of the 123 Roman Catholic contraceptive users, a high 41% are on the pill. For all mechanical and chemical methods, the pill included, it is 72%. Protestants and non-Christians are only an average 10% higher in their usage of these methods. A surprisingly higher number of Roman Catholic women (10) than Protestants (8) and non-Christians (2) have been sterilized (tubal ligation). An extremely low 12% or 33 of the total 281 contraceptive

users practise the only methods of which the Roman Catholic Church approves. Of course Catholic women lead the field, comprising of 57% of this 33. They alone use the temperature rhythm method.

TABLE 6.15

CONTRACEPTIVE METHOD BY RELIGION

	POS		MARA		RAPH		TOCO		ALL AREAS	
	Pill Alone %	Chem Mech %	Pill Alone %	Chem Mech %	Pill Alone %	Chem Mech %	Pill Alone %	Chem Mech %	Pill Alone %	Chem Mech %
R.C.	50	[65]	39	[80]	24	[81]	44	[67]	41	[72]
Prot	60	[75]	48	[90]	20	[70]	33	[78]	44	[82]
NChris	75	[75]	45	[81]	58	[92]	*	*	51	[83]

* - less than 5% of the area's population

Thus affiliation to particular religious denominations is neither related to the practise of birth control nor to the method to be used.

MODERNIZATION

The modernization variables used are female education, male education, female employment, female occupation, male occupation and male/female employment.

(1) FEMALE EDUCATION

The questionnaire was designed with an eight part classification for female education (Appendix A). Since there was a consistently fair degree of under-representation at some levels the data was reclassified into three levels for better analysis and interpretation (Table 6.16). These are primary, post primary and secondary and/or over.

TABLE 6.16

DISTRIBUTION BY FEMALE EDUCATION

	URBAN (POS)		SEMI-URBAN (MARA)		RURAL (RAPH)		RURAL REMOTE (TOCO)		ALL AREAS	
	%	Abs	%	Abs	%	Abs	%	Abs	%	Abs
PRIM	15.8	(18)	23.2	(49)	48.8	(42)	26.1	(24)	26.5	(133)
POST PR	31.6	(36)	46.0	(97)	34.9	(30)	60.9	(56)	43.5	(219)
SEC and/ or Over	52.6	(60)	30.8	(65)	16.3	(14)	13.0	(12)	30.0	(151)
Total	100.0	(114)	100.0	(211)	100.0	(86)	100.0	(92)	100.0	(503)

(1) Primary This category includes women with 0-5 years of schooling. An average of 26.5% of the sample are represented here. There is a definite urban to rural increase in the percentage of females with only this, the lowest level of education. Thus it rises from a low 15.8% in the urban community to 23.2% for the semi-urban area, to an average of 37.0% for both rural areas, that is 26% for Toco and a very high 48.8% for San Raphael.

Of the total 133 in this category, only 9 are totally illiterate, that is, have received no schooling. Two are in the semi-urban and 7 in the rural areas (6 in San Raph and 1 in Toco). Eight of these nine are Indian women over 30 years of age. This reflects the old Indian custom whereby females were given little or no schooling. When age is controlled, the cross-tabulation of education by ethnic origin, though, shows that the trend has ended, since, especially in the younger age groups (15-29) there is no difference in the percentage of Africans and Indians at the various educational levels.

(2) Post Primary This intermediary group includes women who did not go to secondary schools but instead remained at the primary schools for two more years/levels beyond the fifth grade. This level was more prevalant before the island-wide spread of free public Secondary Schools. The Post Primary School Certificate was recognised then, such that with it females were able either to get a better paid job, for example in the Civil Service, or else to gain entry into training schools for professions like teaching and nursing.

Just under half (43.9% or 219) of the entire sample has this as their highest education level. It is the modal class in Marabella (46%) and Toco (61%). Once again there is an urban to rural increase in the percentages of females with only this intermediary education. It rises from 31.6% in the city to 46.0% in the semi-urban area to 60.9% for rural remote Toco.

(3) Secondary and/or Over Of the 151 women (30%) included in this category only 7 attended University, 3 from the city and 4 from the semi-urban area. The city is the only community to have the greatest

percentage of its sample in this highest education category. A little more than one half (52.6%) of its females has secondary and/or above education. From here there is a definite and substantial decline. Thus for the semi-urban district it is only 30.8%. It falls further to 16.3% and 13.0% for the two rural communities of San Raphael and Toco. This drastic urban to rural decline is indicative of the very heavy concentration of secondary and post secondary educational institutions in the city, especially prior to the 1970s.

Fertility - Female Education

An examination of the cross-tabulation of average fertility by female education indicates that the two variables are inversely related (Table 6.17). Thus for each community there is a substantial fertility decline from primary, the lowest education level, to post primary and finally to secondary and/or over, the highest education level (Table 6.17, Fig. 6.3).

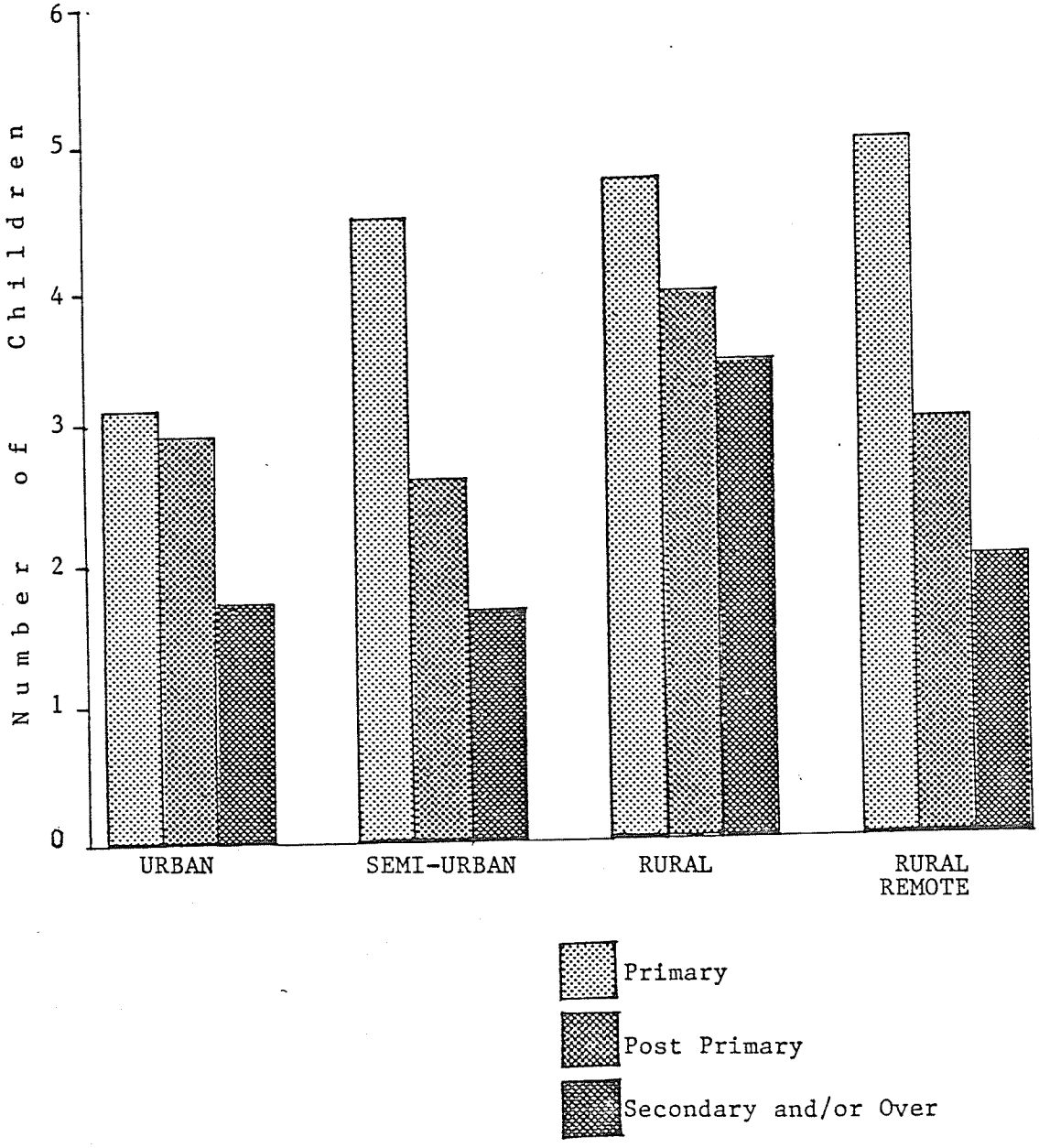
TABLE 6.17

AVERAGE FERTILITY BY FEMALE EDUCATION

	POS	MARA	RAPH	TOCO	ALL AREAS
PRIMARY	3.11	4.49	4.74	5.00	4.49
POST PRIMARY	2.92	2.60	3.93	3.00	2.94
SECONDARY and/or OVER	1.72	1.66	3.43	2.00	1.87

Of the three education-fertility differentials: (1) primary and post primary, (2) post primary and secondary, and (3) primary and

Figure 6.3: AVERAGE FERTILITY BY FEMALE EDUCATION



secondary, the fertility differential is understandably greatest between the lowest (primary) and the highest (secondary). In Port-of-Spain fertility declines from an average of 3.11 children per female with only primary education to 1.72 for those with secondary and/or above education, that is a moderately high difference of 1.39 (Table 6.18). In the semi-urban area the differential is even greater (2.83) since fertility declines from 4.49 for primary education to 1.66 for those with secondary and/or above education. In the two rural communities the differentials are 1.31 for San Raphael and a very high 3.00 for Toco. Average differential for the entire sample is a high 2.62 children.

TABLE 6.18

EDUCATION-FERTILITY DIFFERENTIALS

	POS	MARA	RAPH	TOCO	ALL AREAS
Prim - Sec	1.39	2.83	1.31	3.00	2.62
Prim - Post Pr	0.19	1.89	0.81	2.00	1.55
Post Pr - Sec	1.20	0.94	0.50	1.00	1.07

Except for the city, the second largest differential occurs between primary and post primary education (Table 6.18). It averages at a high 1.55 children. The fertility differential between females with post primary and secondary education is the lowest, yet still it averages at over 1 child (av = 1.07). The range is from 0.50 for San Raphael to 1.20 for the city.

Inter-area fertility differentials persist when education level is controlled. As expected, fertility rises considerably from the urban to the rural communities.

Analysis of variance serves to confirm the above findings. Using female education and area of residence as the two independent variables, the following are the results of the two way analysis of variance:-

(1) The null hypothesis of no fertility variation by female education level must be rejected since the very high calculated F value of 28.92 is significant at the .05 level with 2 and 491 degrees of freedom. This means the fertility differences between the three educational levels are much greater than the within educational group differences.

(2) The calculated F value between fertility and area of residence is 12.07. This is significant at the .05 level with 3 and 491 degrees of freedom. A rejection of the null hypothesis denotes that fertility varies significantly by community of residence.

(3) On the other hand the interaction of area of residence and female education does not produce and acceptably significant F value. Once again the calculated F value is below unity (F = 0.73).

Further analysis of variance, using a two part classification rather than the original three part, indicates that fertility varies significantly between (a) Primary and Post Primary (b) Primary and Secondary, and (c) Post Primary and Secondary and/or over education levels. In these three instances the calculated F values of 19.22, 17.38 and 58.34 respectively, are much higher than the critical F values at the .05 level of significance. Thus fertility varies significantly between all levels of education.

Before concluding this section other points of interest are:

(1) There ia a virtual absence of large families, that is with over 5 children, among females with secondary and/or over education.

(2) No average fertility differentials are evident by ethnic origin when education is held constant.

(3) The results remain unchanged with age as a control variable.

Contraceptive Use - Female Education

The following are the results of the cross-tabulation of contraceptive use by female education (Table 6.19).

TABLE 6.19

PERCENTAGE CONTRACEPTIVE USERS BY FEMALE EDUCATION

	POS	MARA	RAPH	TOCO	ALL AREAS
PRIMARY	61.1	51.0	40.5	45.8	48.1
POST PRIMARY	52.8	52.6	60.0	48.2	52.5
SECONDARY and/or Over	73.3	64.6	64.3	58.3	67.5

With the possible exception of the city of Port-of-Spain, the percentage of contraceptive users seems to rise with education level. The difference in contraceptive usage is especially noticeable between females with the lowest (primary) and those with the highest (secondary and/or over) education levels. Thus as may be expected females with only primary education have the lowest percentage of users (48%). It is only in the city that, for this level, users exceed non-users (61%:39%) by a large amount. The range is from 40% users (San Raphael) to 61% in the city. Not surprisingly, the highest percentage of contraceptive users occurs among females with secondary and/or above education. The range here is from 58% in Toco to 73% in the city. Over two thirds

(68%) of the entire sample of females with secondary education are contraceptive users compared with less than half (48%) for females with only primary education. There is little or no difference in the percentage of contraceptive users between females with primary and those with post primary education (d = 5%). However there is a much wider gap in contraceptive usage between these two and females with secondary education. These figures are quite comparable to that found in Table 6 of Nortman's (1977) study of 'Changing Contraceptive Patterns: A Global Perspective'. For Trinidad and Tobago, the contraceptive use showed a similar increase with level of education. This increase was specially noticed between the lowest level and the secondary and/or over level. Thus only 32% of females without any education ever practised birth control, compared to 48% for those with Junior High School education. The percentage rose to a much higher 64% for those with secondary and/or over education.

A city to countryside decrease in contraceptive users is evident at the secondary and/or level of education.

A chi square value of 5.19 between contraceptive use and female education is not significant at the .05 level with 2 degrees of freedom. Thus here the null hypothesis of no difference cannot be rejected. However, when further analyses are conducted, using two levels of classification for education, instead of the original three, the following are the results. (a) There is a significant difference in contraceptive use between females with only primary education and those with secondary and/or over. When only these two levels are used, the chi value of 4.86 is significant at the .05 level with 1 df. (b) There

is no significant difference in contraceptive use is found between the primary and post primary education level. The calculated chi value of 0.39 is much less than unity. (c) However, when these two education levels are combined, their contraceptive usage is significantly different from that of females with secondary and/or education. Chi-square in this instance is 5.62 which is significant at the .05 level with 1 df. Thus contraceptive use only differs between certain eductional levels. These results are generally in agreement with the statements made when assessing the percentage of contraceptive users by education of the female.

The analyses therefore identify females with the lowest education level as the ones who need greatest attention by the NFPP. Highest fertility and lowest contraceptive usage are found in this group.

(2) MALE EDUCATION

Based upon the responses given to the question on husband's/male partner's education, the following classification was used in the analysis: (1) Primary 1-7 yrs (2) Secondary and/or Over (3) Don't know [Over 1/3 of these were females whose partners lived elsewhere].

As Table 6.20 indicates a fairly high percentage (41.6%) of the entire sample was unable to give a positive response to the question. Primary education is generally more prevalent among husbands/partners of females whose response was positive. It is only in the city that substantially more males (43.0%) have secondary and/or above education compared with primary (15.8%).

TABLE 6.20

DISTRIBUTION BY MALE EDUCATION

	URBAN (POS)		SEMI-URBAN (MARA)		RURAL (RAPH)		RURAL REMOTE (TOCO)		ALL AREAS	
	%	Abs	%	Abs	%	Abs	%	Abs	%	Abs
PRIM and POST Pr	15.8	(18)	39.3	(83)	60.5	(52)	18.5	(17)	33.8	(170)
SEC and/ or Over	43.0	(49)	26.1	(55)	12.8	(11)	9.8	(9)	24.6	(124)
Do not Know	41.2	(47)	34.6	(73)	26.7	(23)	71.7	(66)	41.6	(209)
Total	100.0	(114)	100.0	(211)	100.0	(86)	100.0	(92)	100.0	(503)

Fertility - Male Education

The cross-tabulation of average fertility by male education indicates that the two variables are inversely related. Thus lower fertility is associated with higher male education and vice versa. The overall average fertility difference is quite substantial. It is 1.42, that is 3.46 for primary versus 2.04 for secondary and/or over education. Inter-areally this average fertility difference is 0.88 for the city, 1.11 for the semi-urban area and 2.15 for rural San Raphael. Rural remote Toco is the only area to show no average fertility difference by male education. Note, though, that in Toco (a) only 9.8% or the sample indicated that their husband/male partner had attained secondary and/or education and (b) overall, only 28.3% of the sample were able to give an affirmative answer to this question of male education.

TABLE 6.21

AVERAGE FERTILITY BY MALE EDUCATION

	POS	MARA	RAPH	TOCO	ALL AREAS
PRIM and POST Pr	2.71	3.11	4.51	2.88	3.46
SECONDARY and/or Over	1.83	2.00	2.36	2.89	2.04

Two way analysis of variance, using male education and area of residence as the two independent variables confirms that (a) fertility varies significantly between the two levels of male education. The F value of 11.00 is higher than the critical F value (2.65) at the .05 level of significance (3 and 286 df). (b) Once more significant fertility variation occurs by area of residence since the F value of 8.86 is at an acceptable level of significance. (c) Again, the interaction of the two independent variables, area of residence and male education, does not produce significant variation in fertility. The F value of 1.04 is not at an acceptable level of significance, thus the null hypothesis cannot be rejected.

Contraceptive Use - Male Education

Unlike fertility, contraceptive use does not appear to be related to the education of husband/male partner. The tabulation of percentage contraceptive users by male education indicates that users predominate in both educational categories (Table 6.22). Generally the percentage users among those with secondary education (70%) is not much different

from that for the primary level (63%). However, there is a consistent excess of non-contraceptive users among females in the 'Do not Know' category.

TABLE 6.22

PERCENTAGE CONTRACEPTIVE USERS BY MALE EDUCATION

	POS	MARA	RAPH	TOCO	ALL AREAS
PRIM and POST Pr	66.7	66.3	50.9	82.4	63.2
SECONDARY and/or Over	79.6	65.5	63.6	55.6	70.2

The chi square statistic validates the above finding of no relationship between contraceptive use and male education. The chi value of 0.02 is extremely low. Consequently, the null hypothesis of no difference between the two variables cannot be rejected.

(3) FEMALE EMPLOYMENT

Only 175 or 34.8% of the 503 women in the sample are employed (Table 6.23). The city has the highest percentage of employed females (50.9%). From here the percentage declines considerably for the semi-urban the rural and rural remote communities where it is 33.6%, 27.9% and 23.9% respectively. This city to countryside decline in employment is the result of (a) the much heavier concentration of industrial, commercial, professional and service activities in the capital and primate city region and (b) the higher educational qualification of city women makes it easier for them to obtain employment.

TABLE 6.23

FEMALE EMPLOYMENT

	URBAN (POS)		SEMI-URBAN (MARA)		RURAL (RAPH)		RURAL REMOTE (TOCO)		ALL AREAS	
	%	Abs	%	Abs	%	Abs	%	Abs	%	Abs
EMPLOY	50.9	(58)	33.6	(71)	27.9	(24)	23.9	(22)	34.8	(175)
UNEMPLOY	49.1	(56)	66.4	(140)	72.1	(62)	76.1	(70)	65.2	(328)
Total	100.0	(114)	100.0	(211)	100.0	(86)	100.0	(92)	100.0	(503)

Fertility - Female Employment

An assessment of average fertility by female employment indicates that with the exception of Toco, the fertility of employed females is lower than that of the unemployed (Table 6.24). When age is controlled the trend is even more pronounced at the older, 30-39, and especially at the oldest, 40-49, age group (Table 6.25).

TABLE 6.24

AVERAGE FERTILITY BY FEMALE EMPLOYMENT

	POS	MARA	RAPH	TOCO	ALL AREAS
EMPLOYED	1.55	2.07	4.08	4.18	2.44
UNEMPLOYED	3.11	3.09	4.34	3.11	3.34
DIFFERENCE	-1.56	-1.02	-0.26	+1.04	-0.90

The cross-tabulation of actual number of children ever born by female employment status also indicates that there is a higher incidence of large families of 6 or more children among unemployed females. Thus, in

the city, no employed female versus 4% of the unemployed females have more than 5 children. It is 4% (employed) versus 12% (unemployed) in the semi-urban area and 27% (employed) versus 34% (unemployed) in rural San Raphael. Toco is again the only exception. Here 31% employed females versus 17% unemployed females have large families of over 5 children. Possibly the economic burden of very large families may be forcing mothers of large families to seek employment.

Employed females' fertility averages 2.44 while that of the unemployed is 3.34, that is a difference of 0.88 (Table 6.24). Spatially this difference is greatest in the city where it is 1.56. From here it declines to 1.02 for the semi-urban area and to a very low 0.26 for San Raphael. In the two rural areas there is either no real difference in overall fertility between the employed and the unemployed as is the case in San Raphael where the difference is a mere 0.26, or else the employed's fertility exceeds that of the unemployed, as in Toco where employed females have 1.04 more children than the unemployed. In the latter two cases, though, when age is used as a control variable it is only for the youngest age group (15-29) that the above statement is applicable (Table 6.25). For the two older age groups, especially the 30-39 group, the expected pattern of employed females having less average number of children than the unemployed holds. Especially in Toco, these young females (15-29) already have an average of 2 children. Many are in visitor relationships and receive little or no support from their children's father/fathers, consequently economic necessity forces them to work. This decision to be 'working mothers' is made easier since there are mothers, grandmothers or sisters who can be surrogate mothers.

TABLE 6.25

DIFFERENCES IN EMPLOYMENT FERTILITY BY AGE

	POS	MARA	RAPH	TOCO	ALL AREAS
15-29	-0.82	-0.90	-0.06	+0.51	-0.84
30-39	-1.00	-1.26	-1.57	-1.35	-1.25
40-49	-2.00	-1.46	-0.87	-0.73	-1.21

Once again analysis of variance is used to statistically confirm or refute the above findings which are based solely on everages. The model is the two way analysis of variance. Female employment and area of residence are the two independent variables. Of course, fertility is the dependent or criterion variable.

In the case of female employment status, the calculated F value of 10.25 is greater than F critical at the .05 significance level with the respective degrees of freedom. Consequently, the null hypothesis of no variation must be rejected in favour of the alternate which states that fertility varies significantly by female employment status. Significant F values are also recorded between fertility and area of residence (F = 11.34) and between fertility and the interaction of female employment status and area of residence (F = 4.86). In fact, this is one of the few instances where the interaction effect is significant.

Contraceptive Use - Female Employment

Contraceptive usage is much higher among the employed than among the unemployed (Table 6.26). An average of two thirds (66%) of the employed females practise birth control. The range is from 58% (San

Raphael) to a high 71% (POS). Contraceptive usage is lower among the unemployed. The average is 51% and the range is from 43% (rural remote Toco) to 59% (city).

TABLE 6.26

PERCENTAGE CONTRACEPTIVE USERS BY FEMALE EMPLOYMENT

	POS	MARA	RAPH	TOCO	ALL AREAS
EMPLOYED	70.7	64.8	58.2	68.2	66.3
UNEMPLOYED	58.9	51.4	48.4	42.9	50.3

The significant point here is that usage is lower among the larger group, the unemployed. It is especially so in rural areas like Toco where over three quarters (76%) of the female population are unemployed. Yet here, more than half (56%) of these are not practising birth control. The problem is further compounded when one considers that a good percentage of these unemployed, non-contraceptive users are young but already have a few children. Thus the results highlight yet another group for whom the Family Planning Program should give more attention.

The chi square statistic does confirm that there is a significant difference in contraceptive usage between employed and unemployed females. The calculated chi value of 8.47 is much higher than the critical chi value of 3.84 at the .05 level of significance with 1 df. Thus the alternate hypothesis of significant difference must be accepted in favour of the null hypothesis.

(4) FEMALE OCCUPATION

Based upon the replies to the open question on female occupation a three part classification has been devised.

1) Professional/Managerial/Technical (PMT) This is the highest income and generally better educated group. The majority of the 50 included here are professionals, mainly teachers and nurses. Most of the few in managerial occupations are owners or co-owners of small businesses, for example small groceries, bakeries and general stores. Only two are in the technical field. As is evident from Table 6.27 this occupational group is only well represented in the urban (28%) and semi-urban (37%) areas. Only an average 17% of the employed females in the rural areas are in this category. For the entire sample it is 29% of the total 175 employed females.

2) Clerical This is the middle income group. Many females here are employed as clerks/secretaries in Government offices. The city has the highest representation, with 59% or 34 of its 58 employed females classified as clerical workers. Only 11% of the 46 employed females in the two rural areas are thus employed.

3) Other Workers Included here are service and agricultural workers plus those simply classed as labourers. It is generally the lowest income and educational group. Unlike the two preceding occupational categories, there is now an urban to rural increase in percentages. Thus it is only 14% for the urban area, compared to an extremely high 67% and 77% for the two rural areas.

TABLE 6.27

DISTRIBUTION BY FEMALE OCCUPATION

	URBAN (POS)		SEMI-URBAN (MARA)		RURAL (RAPH)		RURAL REMOTE (TOCO)		TOTAL	
	%	Abs	%	Abs	%	Abs	%	Abs	%	Abs
PROFESSIONAL/MANAGERIAL/TECHNICAL	27.6	(16)	36.6	(26)	16.6	(4)	18.2	(4)	28.6	(50)
CLERICAL	58.6	(34)	24.0	(17)	16.6	(4)	4.5	(1)	32.0	(56)
OTHER	13.8	(8)	39.4	(28)	66.8	(16)	77.3	(17)	39.4	(69)
TOTAL	100.0	(58)	100.0	(71)	100.0	(24)	100.0	(22)	100.0	(175)

Fertility - Female Occupation

The cross-tabulation of average fertility by female occupation indicates that the two variables are related (Table 6.28). This relationship persists even when age is controlled. If occupation is used as a surrogate for income and an ordinal (lowest to highest) rather than a nominal measurement level is applied to the three occupational categories, then this relationship between fertility and female occupation is more curvilinear than linear (Fig. 6.4). Generally clerical workers, the middle income group, has the lowest fertility, averaging 1.52 children per female and ranging from 1.35 (semi-urban) to 1.75 (rural San Raphael). The 'other workers', with the lowest income, has the highest fertility, averaging 3.52 and ranging from 0.75 (urban) to 5.12 (rural Toco). Note that in the two rural communities where this 'other workers' category is largest, fertility is a very high 5.00 for San Raphael and 5.12 for Toco. Inter-areally fertility in the highest income/occupational group is intermediary but generally closer to that of clerical workers. It averages 2.04 and ranges from 1.88 (urban) to a still moderately low 2.75 (rural San Raphael). The city of Port-of-Spain deviates from the above-mentioned norm in that, even when age is controlled, the lowest income/occupational group has the least average number of children per female, 0.75.

With special reference to the urban and semi-urban areas, fertility of the unemployed is understandably much higher than that of any occupational group (Table 6.28). In the two rural areas, though, the unemployed has an average 1.00 child less than that of the 'other workers'. Age as a control variable reverts the results in San Raphael but in Toco

TABLE 6.28

AVERAGE FERTILITY BY FEMALE OCCUPATION

	POS	MARA	RAPH	TOCO	ALL AREAS
PROFESS, MANAGERIAL and TECHNIC	1.88	2.08	2.75	1.75	2.04
CLERICAL	1.59	1.35	1.75	*	1.52
OTHER	0.75	2.50	5.00	5.12	3.52
UNEMPLOY	[3.11]	[3.09]	[4.34]	[3.14]	[3.33]

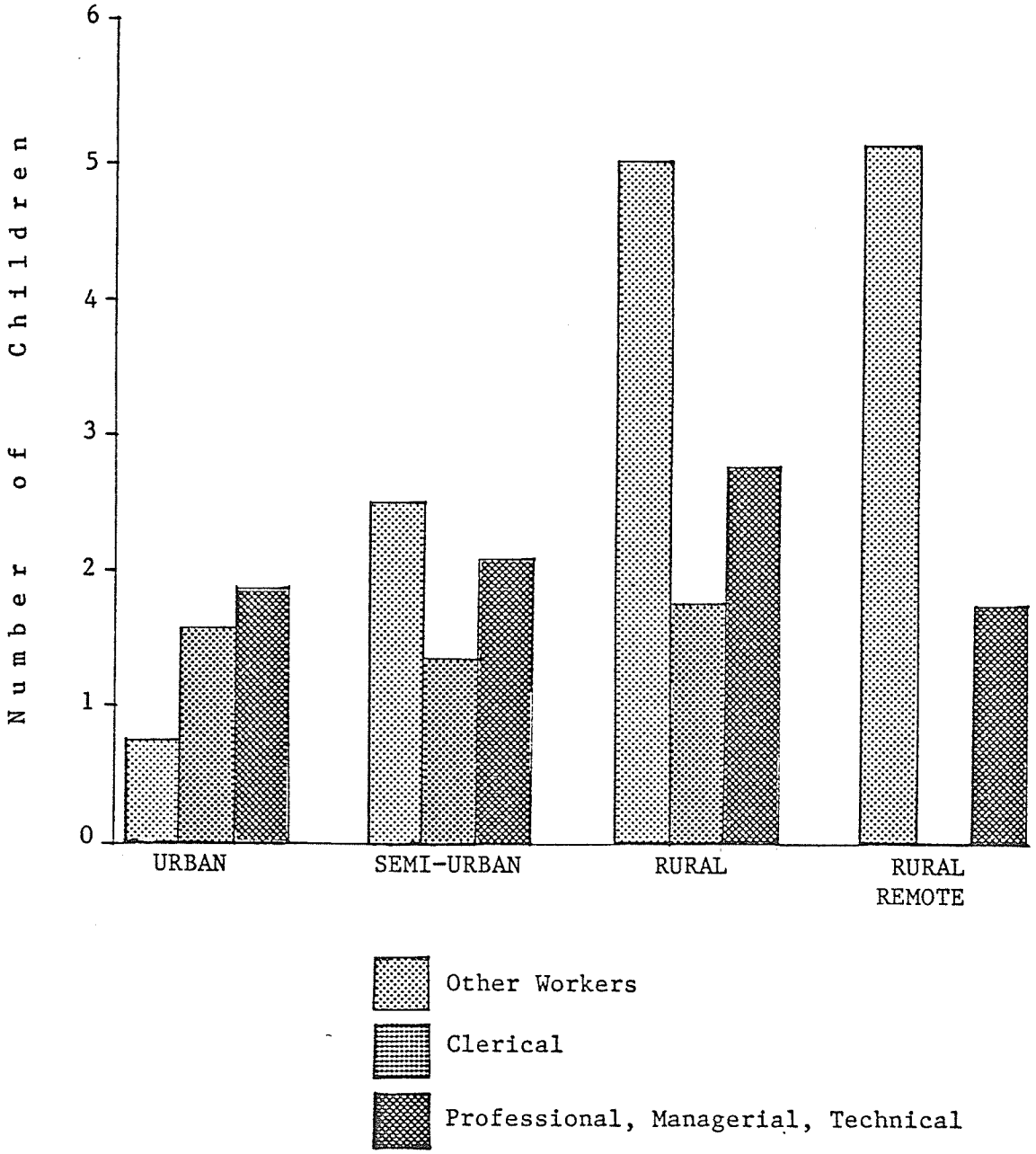
* - less than 5% of the area's population

only the 40-49 age group is affected where 'other workers' have an average 5.71 children and the unemployed 6.44. The only logical way to explain why in some instances unemployed females in rural areas have fewer children than the menially employed is that women of very high fertility may be driven to work because of the economic burden resulting from a very large number of children. In rural areas these women generally have a low level of education and are untrained. Consequently, they can find employment only in the lowest paying jobs, that is as service workers or labourers. Many of them are really underemployed.

For each occupational group fertility declines from the rural to the urban area. The decline is greatest among the 'other workers' (Table 6.28, Fig. 6.4). Once more, except for the 'other workers', semi-urban's and urban's fertility are quite similar. Controls for age leave these results unchanged.

Two way analysis of variance is once more utilized to give more statistical validity to the above findings. Female occupation and area

Figure 6.4: AVERAGE FERTILITY BY FEMALE OCCUPATION



of residence are the two independent variables, while fertility is the criterion variable. The results can be summarised as follows:-

(a) The calculated F value of 3.97 is greater than F critical at the .05 level of significance with the relevant degrees of freedom. Thus the null hypothesis of no fertility variation must be rejected in favour of the alternate. This means that fertility varies significantly by female occupation. Thus, the between occupational group fertility variation is significantly greater than the within occupational group variance.

(b) Fertility also displays significant variance by area of residence. F calculated of 14.53 is way above the level for rejecting the null hypothesis at the .05 significance level with 3 and 163 df.

(c) Like female employment, here too, fertility varies significantly with the interaction of female occupation and area of residence. F = 2.95 is significant at the .05 level with 6 and 163 df.

Contraceptive Use - Female Occupation

If female occupation is once more used as a surrogate for income and the ordinal level of measurement is applied, then the highest occupational/income group has the greatest percentage of contraceptive users and vice versa. The percentage of users in the professional/managerial/technical group, the highest income group, averages at a high 74% (Table 6.29). The range is from 69% (semi-urban) to a very high 81% (urban). Conversely, the lowest contraceptive usage is among the 'other workers', that is the lowest income group. Yet even within this category users outnumber non-users. The average is 58% and the range is from 50% in the city to 65% in Toco.

TABLE 6.29

PERCENTAGE CONTRACEPTIVE USERS BY FEMALE OCCUPATION

	POS	MARA	RAPH	TOCO	ALL AREAS
PROFES, MANAGERIAL and TECHNICAL	81.3	69.2	75.0	50.0	72.0
CLERICAL	70.6	70.6	*	*	69.6
OTHER	50.0	57.1	56.3	64.7	57.8
UNEMPLOY	58.9	51.4	48.4	44.3	50.6

* - less than 5% of the area's population

Each occupational group has higher usage than among the unemployed. This again stresses at the need for the Family Planning Program to concentrate especially on the unemployed and those employed in the more menial jobs. It is good to note though that in both rural areas users exceed non-users among the highest fertility or 'other workers' category. Perhaps this may be some positive results from the existing program.

There is no consistent change in contraceptive usage from urban to rural area as is the case with fertility. The only exception is among the umemployed where usage declines from the city to the countryside.

The chi square statistic which uses absolute rather than relative values indicates that the difference in contraceptive usage between the three occupational groups is not statisticaly significant. The chi value is less than unity (0.62). This though should not detract form the point that was made in the previous section. That is, the unemployed females remain the group of high fertility and lowest

contraceptive usage. This group should be given serious consideration by the NFPP, especially in the rural area.

(5) MALE OCCUPATION

There is a wider range of occupations and thus incomes among the males, therefore the classification of husband's/male partner's occupation differs slightly from that of the females. It is as follows:

1) Professional/Managerial/Commerce (PMC) As with female occupation, there is an urban (49%) to rural (5%) decline in the percentage of males in this the highest occupational/income group (Table 6.30).

2) Clerical and Security Workers (CLSS) Security workers, for example policemen and firemen, are included here since generally their incomes fall within the range of clerical workers. Of the 49 in this category, 43% belong the security field and 57% or 28 are clerical workers. This is the second largest occupational group for city men.

3) Mechanical/Technical (METE) This group and the 'other' category both have the largest percentage of male workers. A total of 126 or 32% of the 394 employed males are mechanics and technicans. For Marabella, the area closest to the Texaco Oil Refinery, this is by far the largest occupational group. Here a high 46% of the males are mechanical/technical workers most of whom are employed at the Oil Refinery.

4) Other Workers (OW) This, the lowest income category, comprises of males engaged in service, agricultural and labouring activities and fishing. Many of these are only seasonal activities and so underemployment is high. The city has the lowest percentage of 'other workers' (15%). From here it rises to a high 64% and 63% for the two rural areas.

TABLE 6.30

DISTRIBUTION BY MALE OCCUPATION

	URBAN (POS)		SEMI-URBAN (MARA)		RURAL (RAPH)		RURAL REMOTE (TOCO)		TOTAL	
	%	Abs	%	Abs	%	Abs	%	Abs	%	Abs
PROFESSIONAL/MANAGERIAL/COMMERCE	49.4	(40)	24.9	(44)	5.0	(4)	5.4	(3)	23.1	(91)
CLERICAL & SECURITY WORKERS	18.5	(15)	12.4	(22)	6.2	(5)	12.5	(7)	12.4	(49)
MECHANICAL & TECHNICAL	17.3	(14)	45.8	(81)	25.0	(20)	19.6	(11)	32.0	(126)
OTHER	14.8	(12)	16.9	(30)	63.8	(51)	62.5	(35)	32.5	(128)
TOTAL EMPLOYED	100.0	(81)	100.0	(177)	100.0	(80)	100.0	(56)	100.0	(394)
* Missing Value	[28.9	(33)]	[16.1	(34)]	[7.0	(6)]	[39.1	(36)]	[21.7	(109)]

*MV -- Missing Value - These 109 missing value cases (19% sample) comprise of females (a) without a husband or common law partner (73%), (b) who admitted that their husband or common law partner was unemployed (5%) and (c) who could not respond to the question (22%).

Fertility - Male Occupation

Referring to Table 6.31 the following statements can be made about average fertility and male occupation:

TABLE 6.31

AVERAGE FERTILITY BY MALE OCCUPATION

	POS	MARA	RAPH	TOCO	ALL AREAS
PROFES, MANAGERIAL and COMMERCE	2.20	2.30	2.75	2.67	2.29
CLERICAL and SECURITY WORKERS	2.93	2.68	2.80	3.00	2.82
MECHANICAL and TECHNICAL	2.93	2.73	3.90	4.18	3.06
OTHER	2.92	4.13	4.61	4.46	4.30

Fertility is lowest in the highest occupational/income group (PMC = 2.29) and highest in the lowest occupational group ('OW' = 4.30). This gives an average difference of 2.01 children between the two occupational groups.

Apart from the above result which is consistent cross-sectionally, the remaining occupation-fertility trends differ from area to area. Thus (a) In Port-of-Spain apart from the PMC group (av fert = 2.20), the remaining three occupational groups have identical average fertility (2.93). (b) In Marabella the three groups, PMC, CLSS, METE, have quite similar average fertility, the range being only 0.43. Each though, has much lower fertility than the least paid 'other workers' group, (d =

1.83, 1.45 and 1.40 respectively). (c) In each of the two rural areas workers in the PMC and CLSS categories also have much quite similar fertility which in each community is much lower than that of the METE and 'Other' workers.

There is an urban to rural increase in average fertility when male occupation is held constant. This is especially evident at the lower occupational groups, that is, the METE and 'Other' categories.

Analysis of variance does in fact substantiate the above findings. Using male occupation and area of residence as the two independent variables, the following are the results of this two way analysis of variance:

(a) The F value (3.06) between fertility and male occupation is above the critical F value at the .05 level of significance with 3 and 378 df. Thus the null hypothesis of no variation nust be rejected in favour of the alternate. Consequently, fertility varies significantly between male occupation categories. However, further analysis points to the fact that most of this significance is due to the large fertility difference between the highest and the lowest occupation/income groups, that is PMC and 'Other' workers. This confirms the above statements made when assessing the tabulation of average fertility by male occupation.

(b) Fertility also varies significantly by area of residence. F calculated is 8.61. This value is in the rejection region for the null hypothesis at the .05 significance level with 3 and 378 df.

(c) However, the interaction of male occupation and area of residence does not produce significant fertility variance. F calculated of 0.23 is below the F critical at the .05 level with 9 and 378 df.

Contraceptive Use - Male Occupation

Except for the 'Other' workers category, the percentage of contraceptive users exceed non-users in each occupational group (Table 6.32). However, the greatest usage is generally in the highest occupation/income group (PMC). The range is from 80% users in the city to 64% for the semi-urban area (Table 6.32). The average is a high 71%. On the other hand contraceptive usage is least in the lowest occupational group. The range is from a low 42% to 57% and the average is 50%. Thus like female occupation these results once more identify where emphasis should be placed by the family Planning Program.

TABLE 6.32

PERCENTAGE CONTRACEPTIVE USERS BY MALE OCCUPATION

	POS	MARA	RAPH	TOCO	ALL AREAS
PROFES, MANAGERIAL and COMMERCE	80.0	63.6	75.0	66.7	71.4
CLERICAL and SECURITY WORKERS	73.3	68.2	60.0	57.1	67.3
MECHANICAL and TECHNICAL	57.1	55.6	60.0	63.6	57.1
OTHER	41.7	50.0	47.1	57.1	50.0

When the four occupational categories are used, chi square indicates that there is no significant difference in contraceptive usage by male occupation. The chi value of 5.74 is less than the critical chi value of 7.82 at the .05 significance level with 3 df. Thus the null hypothesis of no difference cannot be rejected. Pair-wise comparisons of male occupation reveal that a significant difference is contraceptive usage does exist between the highest and the lowest occupational groups.

(6) MALE AND FEMALE EMPLOYMENT

This section has been included to determine whether households with both male and females partners employed display significantly different fertility and contraceptive usage from households with only the husband/partner employed. An average of 26% households have both partners employed (Table 6.33). The percentage is highest (33%) in the city and lowest (16%) in the rural remote area. An average 53% households have only the male income. The rest (22%) are in the MV category described under Male Occupation.

Fertility - Male and Female Employment

In the urban and semi-urban areas the two income families have much lower average fertility (-1.49 and -0.87 lower) than those with only male income (Table 6.34). The results for the two rural areas are similar to that for employed females. Thus (a) In San Raphael the average fertility of two income families is only 0.20 lower than that of the one income. (b) In Toco two income households have higher average fertility than the one income. The explanation used under female employment could be applied here as well.

Two way analysis of variance is used as a statistical test of significance. The results can be summarised as follows:-

(a) There is a significant fertility difference between the one and the two income households. The F value between fertility and male and female employment is 6.88. This is within the rejection region at the .05 significance level. Thus the alternate hypothesis of significant between group variation must be accepted since the null hypothesis is rejected.

TABLE 6.33

DISTRIBUTION BY MALE AND FEMALE EMPLOYMENT

	URBAN (POS)		SEMI-URBAN (MARA)		RURAL (RAPH)		RURAL REMOTE (TOCO)		TOTAL	
	%	Abs	%	Abs	%	Abs	%	Abs	%	Abs
EMPLOYED MALE/EMPLOYED FEMALE	32.5	(37)	27.0	(57)	24.4	(21)	16.3	(15)	25.8	(130)
EMPLOYED MALE/UNEMPLOYED FEMALE	38.6	(44)	56.9	(120)	68.6	(59)	44.6	(41)	52.5	(264)
*MISSING VALUE	20.9	(33	16.1	(34)	7.0	(6)	39.1	(36)	21.7	(109)
TOTAL	100.0	(114)	100.0	(211)	100.0	(86)	100.0	(92)	100.0	(503)

*MV - Missing Value - Described under Male Occupation

TABLE 6.34

AVERAGE FERTILITY BY MALE AND FEMALE EMPLOYMENT

	POS	MARA	RAPH	TOCO	ALL AREAS
EMPLOYED MALE and EMPLOYED FEMALE	1.76	2.26	3.95	5.20	2.72
EMPLOYED MALE and UNEMPLOYED FEMALE	3.25	3.13	4.15	3.71	3.51
DIFFERENCE	-1.49	-0.87	-0.20	+1.49	-0.79

(b) Fertility varies significantly by area of residence. F calculated of 8.97 is significant at the .05 level of significance.

(c) The interaction of male and female employment status and area of residence also produces significant fertility variance. The F value of 4.18 is significant at the .05 level.

Contraceptive Use - Male and Female Employment

Generally in both the one income and two income households contraceptive users exceed non-users (Table 6.35). However, usage is higher among the two income families where it averages 68%. The range is from 62% (rural San Raphael) to 78% (city). This compares with an average 55% users among one income households, with a range from 49% (rural) to 61% (city). These figures are notably higher than the MV category. Here a much lower usage (43%) is reported. The range is from 55% (city), 41% (semi-urban) to a very low 33% in both rural communities.

The chi value between contraceptive use and male and female employment is 5.00. This value is within the rejection region for the null

TABLE 6.35

PERCENTAGE CONTRACEPTIVE USERS BY MALE AND FEMALE EMPLOYMENT

	POS	MARA	RAPH	TOCO	ALL AREAS
EMPLOYED MALE and EMPLOYED FEMALE	78.3	64.9	61.9	66.7	68.4
EMPLOYED MALE and UNEMPLOYED FEMALE	61.3	55.0	49.2	56.1	54.9

hypothesis at the .05 significance level with 1 df. An acceptance of the alternate hypotheses, therefore means that there is a significant difference in contraceptive usage between the one and the two income families.

SUMMARY

The preceding results will now be summarised.

Area of Residence

Both fertility and contraceptive usage are related to community of residence. The relationships are in the expected directions. Thus fertility rises considerably from urban to rural areas. Conversely, contraceptive usage declines from urban to rural areas. These results remain unchanged when demographic, cultural or modernization variables are added as controls.

Demographic Variable - Age

Age has been introduced specifically to validate some of the inter- and intra-area relationships between fertility/contraceptive use and the other independent variables. In this respect, when age is entered as a control variable, most results either remain unchanged or else the differences become more pronounced. The only outstanding change is in the case of the ethnic variable. Generally fertility differentials are unrelated to ethnic origin, yet when age is controlled Indians display much higher fertility than the rest of the population beyond age 34.

As an independent variable, age is significantly related to fertility and contraceptive use. Its relationship with fertility is understandably positive. Thus fertility rises with increasing age. Age 30 seems to be the crucial age separating former higher fertility from the recent trend towards lower fertility. Also, too, beyond age group 30-34 urban to rural fertility differentials are more pronounced. The relationship between age and contraceptive use is non-linear, taking on an inverted U shape. There is lower contraceptive usage at the youngest and especially the oldest ages and greater usage at the middle ages.

Cultural Variables

Except for union status, the cultural variables are generally unrelated to fertility and contraceptive use differentials.

Ethnic Inter- areally no ethnic group has consistently higher or lower fertility or contraceptive usage than the other. As mentioned earlier, though, the only noticeable change occurs with fertility when age is controlled. Beyond age 34, Indians have considerably higher fertility than the rest of the population. This (a) confirms the former

pattern of characteristically higher fertility among Indians, but (b) indicates that the trend may be at an end since below age 34 there are either no real differences in ethnic fertility or else Indians have lower fertility than Africans. The only other noteworthy result is that for each area, whichever ethnic group has highest fertility also has the highest percentage of contraceptive users. This may be perhaps due to the efforts made by the NFPP to reach women of high parity.

Union Status Generally the only significant difference in fertility occurs between females in visitor union and those in either of the two residential unions. The former has much lower fertility than the latter. Even so the visitor group should not go unnoticed since, especially in rural remote Toco, it represents a fair percentage of the sample and fertility averages at two children per female. Contraceptive usage is highest in married unions and lowest in visitor unions. This therefore identifies 'single' females and to some extent those in 'common law' unions as possible targets for the NFPP.

Religion Generally religion, including affiliation to the Roman Catholic Church, is neither related to fertility, the practise of birth control nor to the contraceptive method used. These results are similar to those of Jaccard and Davidson (1976) in the U.S.A. and of Family Planning Today (1978) in Britain, both of whom found that Roman Catholic women were no different from Protestants in their approval of birth control, nor of their intended or actual use of church proscribed contraceptives.

Modernization Variables

Unlike the cultural variables, all modernization variables used are significantly related to fertility and most of them to contraceptive use. All relationships are in the expected directions. Thus the relationship with fertility is inverse whereas with contraceptive use it is positive. For example, the better educated, the employed and the better employed females and those with better employed husbands/partners have lower fertility and show greater contraceptive usage. A deviation occurs with male education which is unrelated to contraceptive use.

Thus the multifaceted modernization is now more important to fertility and contraceptive usage than cultural factors. The prominence formerly given to such cultural characteristics like Indian origin and affiliation to the Roman Catholic church can now be replaced by factors like education, employment, occupation and income.

Chapter 7

INFORMATION ON CONTRACEPTION AND IDEAL FAMILY SIZE

INTRODUCTION

One of the aims of this thesis is an assessment of the success of the National Family Planning Program. To this end, the first part of the chapter will, analyse (a) the extent of knowledge about and also attitude towards family planning, and (b) the importance of the National Family Planning Clinics as a source of supply. Once more the concern is with inter-area variations.

The second part of the chapter is devoted specifically to the question of ideal/desired family size. It will also note whether attempts are being made to ensure that ideal and actual family size are as compatible as possible, for example by use of contraceptives.

CONTRACEPTIVE KNOWLEDGE

Even though detailed knowledge of specific methods of contraception may be limited, almost the entire sample (99%) in the urban as well as in the rural and rural remote areas know that it is possible to plan families or control births. The majority either stated 'the pill', 'family planning' or 'go to the family planning clinics' as ways and means of controlling births or acquiring such knowledge. The very few who did not know about 'family planning' were all rural residents 45-49 years old who had not given birth in a number of years. Thus for this

group contraception is not necessary. These results are extremely positive and promising. It means that the Family Planning Program has been successful in its advertising campaigns, particularily in the rural areas. Part of this success may be attributed to relatively good island wide communication channels, especially radio. Even though many females in rural areas may not read the daily or weekend newspapers, watch television or visit community centres wherever they exist, the majority listen to the radio. Not only does it broadcast national and international events but occasionally it also gives information about family planning. The family planning clinics are also very important in spreading knowledge of and giving supplies for practising birth control, all of which are free of charge.

ATTITUDE TO CONTRACEPTIVES

Once again the percentage of contraceptive users (55%) is a far cry from the the 88.1% or 443 of the total sample who approve of family planning or birth control. The city with 91.2% approvers and the semi-urban area wth 93.8% have the highest percentages. It is 81.6% for rural remote Toco and only 76.7% for rural San Raphael.

A small 4.2% are disapprovers. Inter-area distribution is as follows: 5.3% in Port-of Spain, 2.8% in Marabella, 3.5% in San Raphael and 6.5% in Toco. Most of these disapprove on moral and/or religious (not necessarily Roman Catholic) grounds, or because of fear, especially of negative effects, of the unknown.

Those unable to take a stand in either direction, number a small 39, or 7.8% of the entire sample of 503 females. There is a definite

urban/semi-urban to rural rise in percentages. For the urban and semi-urban areas only 3.5% and 3.3% are in the 'do not know' category. This compares to a high 19.8% for rural San Raphael and 12.0% for rural Toco. This trend may be due to the fact that urban and semi-urban females are generally better educated and so may possess more specific knowledge of contraceptives which therefore would enable them to form more definite opinions, positive or negative, about the topic.

CONTRACEPTIVE METHOD

In order not to influence the respondent's answer and also to validate that she was in fact practising birth control, the question on method of contraception was open-ended. To facilitate recording and coding of responses, though, the questionnaire form contained 20 of the more popular traditional and modern contraceptive methods plus an 'other methods' category (Appendix A, Q19).

The pill is by far the most popular method of contraception (Table 7.1). This is so even when factors like area of residence, age, ethnic origin, religion, education and employment are considered. This very effective contraceptive is utilised by just under one half (45%) of all females practising birth control (Table 7.1). The percentages, though, decline from the city (55%) to the semi-urban area (45%) and to both rural areas (32% and 38%).

Except in the city, the condom, a male contraceptive, is the second most popular method. The average is 21% and the range is from only 4.4% in the city, to a high 28% in the semi-urban area. It is 27% in rural San Raphael and 24% in rural Toco. This popularity of the condom may be

TABLE 7.1

CONTRACEPTIVE METHODS USED

	URBAN (POS)		SEMI-URBAN (MARA)		RURAL (RAPH)		RURAL REMOTE (TOCO)		TOTAL	
	%	Abs	%	Abs	%	Abs	%	Abs	%	Abs
Pill	55.4	(41)	44.9	(53)	31.8	(14)	37.8	(17)	44.5	(125)
Condom	4.1	(3)	28.0	(33)	27.3	(12)	24.4	(11)	21.0	(59)
Rhythm	10.9	(8)	5.1	(6)	11.4	(5)	15.6	(7)	9.1	(26)
Fem Ster	9.5	(7)	7.6	(9)	0.0	(0)	8.9	(4)	7.1	(20)
I.U.D.	5.4	(4)	3.4	(4)	11.4	(5)	6.7	(3)	5.7	(16)
Other	14.9	(11)	11.0	(13)	18.2	(8)	6.7	(3)	12.5	(35)
Total	100.0	(74)	100.0	(118)	100.0	(44)	100.0	(45)	100.0	(281)

a reflection of (a) the supply outlets, for example family planning clinics and a few factories or work places, which distribute free condoms. (b) For those who prefer not to use the free supply outlets, the condom is one of the cheaper contraceptive methods. (c) It is widely used by those in visitor unions where sexual contact may be infrequent or sporadic and thus the onus is left to the male to provide the contraceptive. (d) It has the least side effects, especially in relation to the pill or the IUD.

Every other method is used by less than 10% of all contraceptive users and the order of importance for each differs inter-areally. The rhythm methods (9.3%), female sterilization (7.1%) and the IUD (5.7%) are the most utilised of these less popular methods.

SOURCE OF CONTRACEPTIVE SUPPLY

Contraceptive users were asked to give their source of supply. This is to assess the relative importance of the various supply outlets, particularily the family planning clinics versus the private sources. As mentioned earlier, in Trinidad and Tobago contraceptives, for example the pill, condom and diaphragm, can be obtained without prescription. Table 7.2 lists the inter-area distribution for the various outlets. The N/A category refers to those women practising methods of birth control which do not require supply.

TABLE 7.2

SOURCE OF CONTRACEPTIVE SUPPLY

	URBAN (POS)	SEMI-URBAN (MARA)	RURAL (RAPH)	RURAL REMOTE (TOCO)	TOTAL
	% Abs	% Abs	% Abs	% Abs	% Abs
FP Clinic	13.5 (10)	38.1 (45)	50.0 (22)	66.7 (30)	38.1 (107)
Drug Stor	35.1 (26)	30.5 (36)	25.0 (11)	13.3 (6)	28.1 (81)
Priv Doct	20.3 (15)	16.1 (19)	9.1 (4)	4.4 (2)	14.2 (40)
Other	0.0 (0)	0.9 (1)	6.8 (3)	0.0 (0)	1.4 (4)
N/A	31.1 (23)	14.4 (17)	9.1 (4)	15.6 (7)	18.2 (51)
Total	100.0 (74)	100.0(118)	100.0 (44)	100.0 (45)	100.0 (281)

N/A - No supply needed for method used

The most striking feature of the table is the substantial urban to rural increase in the percentage of those whose contraceptive supply comes from the public outlets, that is the free family planning clinics. it is only 13.5% of the urban sample, compared to 38.1% for the semi-urban area, 50% for rural San Raphael and a very high 66.7% for rural remote Toco. Family Planning clinics are in fact the most important

source of supply in the semi-urban and rural areas while it is of least importance in the urban area. Generally most users were satisfied with the service at the clinics. A few complained about the distance they had to travel to get to the clinics and the waiting time before being served.

Private sources (drug stores and private doctors) which require the outlay of capital by the users, decline in importance from the city (55.4%) to the semi-urban area (46.4%) to rural San Raphael (34.1%) and finally they are only used by 17.7% of contraceptive users in rural remote Toco. Drug stores are the most utilised of all private sources. Most city women (35.1%) are thus supplied. They are second in importance to the semi-urban (30.5%) and rural (25.0% and 13.3%) women. A low 14.2% purchase their contraceptives from private doctors and once more the decline is from urban (20.3%) to rural remote Toco (4.4%).

Thus family planning clinics have a very great role to play in rural, particularily rural remote areas, where drug stores and private doctors are either extremely few in number or non-existent as in the case of Toco. What may be important here, too, is the fact that supply is free at the clinics. Some contraceptives, for example the pill and condom, require regular use and replenishment of supply. This may of course be too costly for a number of users, especially the unemployed and/or those in rural areas. Thus for many the choice is either to be supplied by the free clinics or not to use contraceptives at all.

These results also point at the importance of using primary data, wherever possible, in studies related to contraceptive use. When secondary data alone are used, non-clinic users (spillover effect) can only

be roughly estimated. As this study shows over half of those practising birth control, especially in the city, have private sources of supply. With only secondary data total usage may have been greatly misrepresented or under-estimated. This is especially significant in cross-sectional studies where there is an uneven areal distribution of private supply outlets as in the context of Trinidad and Tobago.

REASONS FOR NOT PRACTISING BIRTH CONTROL

Based upon results of past surveys, seven possible answers were supplied for the question asking users to give reasons why they were not practising birth control (Appendix A, Q20). Interestingly, the highest percentage (39.6%) were those who were unable to give a specific reason. Inter-areally, a greater percentage of the rural (55%) than the urban (25%) non-users could provide no reason. Next in line are females who cannot get pregnant (27%). Most of these are over 40 years and have not conceived in a number of years. This is followed by an overall average of 11.7% of females who want to get pregnant, most of whom are young, under 30 years and/or are either childless or else have one or two children. One-tenth of all non-contraceptive users was pregnant at the time of the survey. The city sample had the lowest percentage of pregnant women (5%) and rural remote Toco the most (14.9%). The rest of those not practising birth control either were disapprovers of contraceptives, had husbands/partners who disapproved or else had very young babies. A high percentage of the latter stated that they would be using contraceptives in the future.

IDEAL FAMILY SIZE

Apart from asking for the actual number of children, the fertility section of the questionnaire also required that the respondent give her ideal or desired completed family size. This question was included for several reasons.

(1) In the 1960s the Govermment of Trinidad and Tobago finally, openly acknowledged that rapid population growth was retarding economic development. Consequently, a National Family Planning Program was established in 1967, which aimed at reducing the national birth rate. This family planning approach to solving the population growth problem though, is a soft approach, there is no coercion. Women are encouraged to plan families, eliminate unwanted births and thereby have only the number of children they want. Thus family size decision is left entirely up to the individual. Yet, as studies in the developing world have shown, the number of children individuals want can be high, too high to really make significant and rapid changes to the national birth or growth rate. This thesis will note whether in the case of Trinidad, ideal or desired family size is, on an average, at a nationally acceptible low or even medium level or whether it is at an unacceptably high level. The expressed ideal or desired family size could indicate future trends in birth rates.

(2) Related to the above aim, the analysis will also highlight the extent to which attempts are being made, via contraceptive use, to keep desired and actual family size as identical as possible.

(3) Finally, the analysis will indicate whether or not inter-area differences exist in ideal family size as they do with actual fertility.

If there are no inter-area differences in ideal this could mean that city women and for example, the better educated, are more able to fulfill family size ideals since eventually they display lower fertility.

In this closed question, the respondent had a choice (a) of not giving a specific number, in which case she was supplied with five possible replies from which to select one, or (b) of specifying an ideal or desired number (Appendix A, Q13).

Of the 503 women in the sample, one fifth (19.9% or 100) could not give a specific number (Table 7.3). There is a definite association with area of residence in that only 2.6% of the urban sample gave this type of response, compared with 20.9% for the semi-urban area and a high 29.0% and 30.4% for both rural areas. Interestingly too, of the five choices given, the two most popular for the rural females were 'The number God gives her' and 'The number she has'. On the other hand the three city women included here all gave 'The number she wants' as their reply. These differences could represent more rationalistic or modernistic thinking on the part of urban females compared to a fatalistic outlook by rural females re the topic of conception and contraception.

A total of 403 (80.1%) specified an ideal number. The most popular replies were 2 children (25.4%) and 4 children (29.8%) with no specific sex preference. The percentage favouring small (0-2 children) and medium (3-4) size families shows a definite urban to rural decline. For example, 38.6% of the urban sample specified a small family size. It declines to 27.5% for the semi-urban area, 18.5% and 15.1% for both rural areas, respectively. It is just over one quarter (26.4% or 133) for the entire sample. Only 0.8% or 4 females specified an ideal of 1.

TABLE 7.3

IDEAL FAMILY SIZE

Ideal No of Children	URBAN (POS)		SEMI-URBAN (MARA)		RURAL (RAPH)		RURAL REMOTE (TOCO)		ALL AREAS	
	%	Abs	%	Abs	%	Abs	%	Abs	%	Abs
0-2 (Small)	38.6	(44)	27.5	(58)	15.1	(13)	18.5	(17)	26.4	(133)
3-4 (Medium)	51.7	(59)	47.9	(101)	41.9	(36)	39.1	(36)	46.1	(232)
5-6 (Large)	7.0	(8)	3.3	(7)	12.8	(11)	12.0	(11)	7.3	(37)
7-8 (V Large)	0.0	(0)	0.4	(1)	1.1	(1)	0.0	(0)	0.3	(2)
None Specified	2.6	(3)	20.9	(44)	29.1	(25)	30.4	(28)	19.9	(100)
Total	100.0	(114)	100.0	(211)	100.0	(86)	100.0	(92)	100.0	(503)

None gave 0 as an answer. A moderately high 72.5% gave ideals ranging from 1-4 children. Almost the entire urban sample (90.4%) is included in this small to medium size category. From the city the decline is considerable. It is 75.4% for the semi-urban area, 57.6% and 57.1% for both rural areas. Conversely, fewer city women 7.0% than rural women (14.0%) favour large families, that is with over 4 children. Only a low 0.3% or 2 of the entire sample gave a number above 6 children.

Thus as with actual fertility, ideal family size shows an urban to rural increment. The results though, at least confirms that large families, over 4 children, may be a thing of the past. The norm is now toward the medium size (3-4 chldren). What is also interesting is that

when specifying their desired or ideal size most females stated that economic conditions are not conducive to large families. Even women with over 4 children indicated that if they had to begin childbearing again they would not have more than 4 children.

Finally, an assessment will be made as to the relationship between expressed ideal family size and contraceptive behavior. To this end, actual fertility was cross-tabulated by contraceptive use/non-use while ideal family size, wherever stated, acted a control variable.

First, for the 100 who could not specify an ideal number, 44% have 0-2 children, and 66% have 0-4 children. Thus one third already have large families. On an average non-users of contraceptives outnumber users by 3:1. Therefore this group could be a problem.

Small Ideal (0-2 children) Of the 133 females who specified a small completed ideal family size, 65% (86) are contraceptive users. Taken one step further, 74% or 99 of these 133 have only 0-2 children with 64% practising birth control. The urban (75% users) to rural (57% users) decline is again evident.

Small-Medium Ideal (0-4 children) As mentioned earlier, 365 (72.5%) specified ideals of 1-4 children. A high 81% of these are contraceptive users. Again, a high 84% or 305 have only 0-4 children, of which 62% or 188 are contraceptive users. Once more the urban to rural decline in contraceptive users is in effect.

These results indicate that not only do the majority of women have less than or are at their ideal family size, but also that most or approximately two-thirds of them, are making an effort to keep desired and actual family size more compatible. It also indicates that the present

actual fertility differentials by area of residence will persist since not only do more urban females have small family size ideals but more of them practise birth control in an effort to achieve their ideal.

Chapter 8

CONCLUSION

COMPARISON OF SECONDARY AND PRIMARY DATA RESULTS

FERTILITY

Even though different modes of analyses were performed, the primary (survey) and secondary (Census and Population Council) date both produced very similar results concerning the relationships between fertility and the modernization and cultural variables.

(1) Thus both showed urban residence, higher levels of female education and female employment to be significantly associated with lower levels of fertility. The primary data were most useful in showing the intra-area progression from low to high fertility according to specific modernization characteristics, for example education.

(2) Results from the primary and secondary data analyses showed that ethnic origin and religion were unrelated to fertility differentials.

(3) On the other hand, both indicated that residential unions (legally married and common law) were associated with higher fertility. Secondary data showed that there was a low and negative relationship between fertility and married unions while it was high and positive for consensual unions. On the other hand, the survey found that though consensual unions had lower fertility than legally married unions the difference was very small and insignificant. Since the survey was conducted eight years later than the secondary or census data, these differing results

could represent some temporal change whereby either (a) women in common law unions are increasing their family size to the extent that it is now very similar to that of women in legally married unions, or, more likely (b) women in married unions are having fewer children than before.

CONTRACEPTIVE USE

Secondary data only accounted for those contraceptive users who attended the family planning clinics. Thus it was an incomplete estimation of total contraceptive usage. In this respect the survey was most helpful since it considered all females practising birth control whether or not they attended the family planning clinics.

(1) Both survey and secondary data analyses found urban residence associated with greater contraceptive use.

(2) In both analyses, neither ethnic origin nor religion was related to contraceptive use. However, an assessment of the tabulation of average fertility and percentage contraceptive users by ethnic origin did reveal that, for each area, contraceptive use was highest for the ethnic group which had the highest average fertility and vice versa. Since inter-areally no one ethnic group had a monopoly on highest fertility or lowest contraceptive usage, it was therefore concluded that parity was more likely the factor related to fertility and contraceptive use rather than ethnic origin.

(3) Census (1970) and survey (1978) data produced differing results for the union status - contraceptive use relationship. The census data found no relationship between contraceptive use and either percentage females in residential unions ($r = -.012$), percentage of females in common law unions ($r = .094$), or percentage females in legally married

unions (r = .109). On the other hand, the survey data found that the difference in contraceptive usage between the three union status categories (visitor, common law and legally married) was significant at the .05 level (chi square = 7.02 with 2 df). A significant difference in usage was also found when only common law and legally married unions were considered. This discrepancy in the results might be related to the fact that the secondary data only accounted for contraceptive users who attended family planning clinics while the survey data included both clinic and non-clinic attenders. Also, these results give a certain degree of validity to the second hypothesis mentioned above, when comparing census and survey results for the fertility- union status relationship. It was mentioned then, that one possible reason why the survey, unlike the census data, showed no fertility difference between common law and legally married unions could have been due to the fact that the latter union might be having fewer children than in the past. The survey data on contraceptive use helped to confirm this point since greatest contraceptive usage occured among females in this legally married union.

(4) Only the primary data indicated that greater contraceptive usage was associated with the employed versus the unemployed, the better employed and the better educated female. This was not the case with the secondary data. The latter found no relationship between percentage contraceptive users and the percentage employed female, the percentage employed in manufacturing and the percentage of females with a higher level of education. This discrepancy in the results might again be related to the above-mentioned flaw of the secondary data. That is, it

is an incomplete estimation of total contraceptive usage. Generally, the better educated, better employed and especially the city residents prefer to utilize private or non-program sources for their contraceptive supply. This emphasises once more the usefulness of the primary or survey data.

Thus both types of analyses were complementary. The one helped to confirm, emphasise or validate the results of the other. The secondary data were especially important in isolating the program input variable as essential to contraceptive use. The survey went one step further and stressed the importance of family planning clinics in rural areas and especially in the servicing of those of lower socio-economic status.

RELATION OF FINDINGS TO THESIS OBJECTIVES

The thesis was primarily concerned with ways of improving contraceptive usage. Thus it sought to identify those segments of the population who had high fertility and/or low contraceptive usage. The survey and secondary data were able to isolate the following groups as being most in need of attention by the NFPP:-

(1) 'Single' females, that is, those in visitor and common law unions. Contraceptive usage is lowest for these two unions. This problem takes on special significance in the rural remote area where fertility is either high (common law) or else there is the potential for it to be so (visitor).

(2) Lower educated females, especially those who leave school at or just after the primary level.

(3) Unemployed and underemployed females.

(4) Young females in rural areas. Not only is fertility high here, but contraceptive usage is low.

Secondly, the thesis also aimed at assessing the importance of the NFPP. This was done in two ways. (a) It was essential to see what relationship, if any, existed between program input (sessions, clinics, supply) and output (contraceptive use). The secondary data found that the program input variable produced the highest relationship with percentage contraceptive users. In fact, the only other variable in the analysis to display a significant, but lower relationship with contraceptive use was urbanization. The primary data also pointed to the great importance of the NFPP. With special reference to the rural areas, family planning clinics are an essential source of contraceptive supply.

(b) The thesis also assessed whether the relationship or lack of relationship between contraceptive use and select variables was the same as that between fertility and those same variables. Thus, for example, it was hypothesised that if the independent variables were related to fertility but not to contraceptive use, then, this might indicate that the program was achieving its goal of reaching all segments of the population, especially those prone to high fertility. The secondary data did show that urbanization was the only variable which was related to both fertility and contraceptive use. Even so it bore a stronger relationship to fertility ($r = -.726$) than to contraceptive use ($r = .335$).

With the primary data, union status, female employment and male/female employment were the variables which showed a distinct relationship with both fertility and contraceptive use. Fertility differed significantly by female education, male eduction, female occupation and male occupation. On the other hand significant differences in contraceptive use only existed between the highest and lowest categories of these latter variables. No relationship was found between contraceptive use and male education. Thus even though much work is still left to be done by the NFPP in the way of increasing usage by certain segments of the population, yet these results seem to indicate that some headways may have been made.

Finally, the thesis aimed at assessing whether spatial variation still existed for fertility and also contraceptive use. As mentioned earlier, both analyses found that a strong negative relationship still exists between fertility and urbanization. However, in the survey data, when age was used as a control variable, the urban - rural fertility difference was less for the younger age groups (15-29) than for the older groups. Both types of data also found highest contraceptive usage in the urban areas. Yet, the association here was weaker than with fertility. Once more the NFPP may be contributing to this narrowing of the fertility and contraceptive use gap between urban and rural area. This though, should not detract from the fact that rural areas are still characterised by higher fertility and lower contraceptive use. Even though ideal family size is generally moderate to low, yet the rural females still have higher stated ideal size.

RECOMMENDATIONS

A few introductory remarks are essential before any recommendations are made. Firstly, this thesis did not and could not cover all the issues relating to the topic of contraceptive use. The scope of this subject is very extensive. Therefore, only some of the more salient issues, and those for which data were available, have been examined. Consequently, the recommendations made should not be considered as completely exhaustive. They are only made in relation to the issues covered. Results and recommendations should not be taken as the final say on the matter. Much is still left to be done in this relatively new field. The last section therefore itemizes some of the possible avenues for future research. Secondly, the final decision as to whether recommendations are taken totally, partially or not at all, rests with the politicians and financial planners. With these points in mind the following recommendations will be made as ways of increasing contraceptive use and thereby reducing the birth and growth rates.

The approach to solving the population growth problem should continue to be a mixed one, focusing on a combination of socio-economic development and contraception, both of which were proven to be important to fertility and/or family planning. Development seems to create the need or desire for smaller families and thus the motivation to control births, while the family planning program provides the means whereby these goals can be realized.

Development Special consideration should be given to increasing gainful, year-round employment for women especially the younger ones (15-29) and those in rural areas. Women who lack the educational

requirements essential for employment should be trained with job-related skills.

Family Planning The rural areas, especially in Tobago, in eastern Trinidad and those away from the major urban centres, should be given high priority by the National Family Planning Program. Not only are birth rates highest here, but there is also a scarcity of private contraceptive outlets. Thus the onus is left to the government to fill these needs. The survey showed many of these women do in fact want or desire smaller families than in the past. Thus the provision of readily available, inexpensive or cost-free contraceptives could make desire and actuality more compatible.

Importantly, rather than terminating family planning clinic activity in areas where attendance is low, serious effort should instead be made to discover the reasons behind those poor clinic performances. In this respect field workers, at present sorely lacking in numbers, could be of condiserable assistance. In some developing countries, for example Indonesia (Hull et al, 1977) and Barbados (Jones, 1977), field workers have proven to be invaluable in spreading knowledge about birth control and increasing the number of contraceptive users. This survey showed that even though women in rural Trinidad desire small to medium size families (2-4 children), and have heard about family planning, yet many of them do not practice any form of birth control. The field workers, with a more personal approach, could help motivate these women towards contraception or at least attempt to lower or eliminate the barriers which prevent it.

The family planning program should also place more emphasis on reaching the young, especially those in rural areas, those of low education attainment, the unemployed and menially employed and those in visitor and common law relationships. 'Single' women, especially those in visitor unions in rural areas, should be continually made aware of the risk of conception even when sexual contact is infrequent. Thus, if they do not want to conceive they must ensure that some form of contraceptive is used whenever there is sexual contact.

Finally, but by no means of least importance, the Family Plannig Program should continue to utilise the mass media, especially radio and TV, to the fullest. The public needs to be continually reminded of (a) the problems created by high population growth, and that (b) every one can do something to improve the situation. The National Family Planning Week, a week of concentrated family planning activity, should also continue on the present annual basis.

FUTURE RESEARCH

The following are the suggestions for future research:

(1) For comparative purposes the results of the 1980 Census of Trinidad and Tobago, and statistics from the National Family Planning Program should be used is an analysis similar to the one conducted in Part 11 (Secondary Data Analysis), of this thesis. This will indicate if certain trends noted are continuing to be in effect over time. For example, it will disclose (a) whether or not factors like education and urbanization still have a strong relationship with fertility, and (b) whether or not contraceptive usage, especially among family planning

clinic attenders, is still more related to input into the family planning program than to other factors. These results should highlight the direction future population plans and policies should take. It must be emphasised that plans and policies should always be flexible. They should be able to adapt to changing conditions and needs.

The 1980 Census of Trinidad and Tobago should also be valuable in noting any changes which may have occured in fertility during the inter-censal period, 1970-1980. Fertility levels and change could be compared with the fertility goals set by the Population Policy. By the 1980 census the NFPP would have been 13 years in existence. Thus if fertility is on the decline, the study could proceed further and assess the contribution made by the NFPP vis-à vis socio-economic factors.

(2) As mentioned earlier the survey conducted for this thesis did not take into consideration specific age of mothers for specific birth orders. It is suggested that future research on fertility and contraception include this as one of the factors. Age is a very important control factor in any analysis of inter-group fertility. Age of mothers at specific birth parity could improve these results, especially in terms of their predictability.

(3) If time and money were available, a time-series or longtitudinal survey should be attempted. This would trace fertility and contraceptive usage of specific females over a certain time span, for example over 10 years, with periodic checks at specific intervals. This would be especially useful in problem areas, that is areas of high or potentially high fertility and low contraceptive usage. Points which could be noted here are (a) the changes in the practise of birth control over

time, (b) the changes in family size, and (c) importantly, how compatible is stated ideal family size at the initial interview to actual fertility levels over time. If actual fertility is higher than the stated ideal, the reasons for this should be known. For example, were the additional births 'accidents' or were they planned. On the other hand, if actual is very similar to the ideal, then stated ideal family size may in the future be used as an estimator of future fertility trends.

These three areas are of course not exhaustive of all the possible avenues for future research on this very broard and important topic of fertility and contraceptive use. Among other possible choices could be (a) an indepth consideration of the psychological and economic aspects involved in fertility and contraceptive use behaviour. (b) an analysis of the family size decision-making process. For example, on what is the decison to have the next child or a certain family size based? Is it based on economic considerations, mate, peer or familial pressure, or is childbearing simply related to personal fulfilment or gratification. (c) The aspect of religious devoutness or religiosity rather than religious affiliation per se, could also be the topic of future reseach. All these factors, though, cannot really be considered with any depth in one study. The area(s) selected would ultimately depend on the research objectives, the cost and the time available.

Appendix A

TRINIDAD AND TOBAGO
FERTILITY AND FAMILY PLANNING SURVEY

INDIVIDUAL QUESTIONNAIRE

1. COMMUNITY NAME
2. HOUSEHOLD ADDRESS

3. To which of the following age groups do you belong?
   15-19 20-24 25-29 30-34 35-39 40-44
   45-49 50+

(The rest of the questionnaire limited to those 15-49 years.)

4. To which religion do you belong?
   Anglican Roman Catholic Hindu Muslim Other
   None Not Stated

5. At which level did you leave school?
   i) No School
   ii) Primary - 1 to 3 years
   4 to 6 years
   6+ years
   iii) Secondary - 1 to 3 years
   4 to 5 years
   5+ years
   iv) University
   v) Other - Specify

6. What is your marital or union status?
   i) Single - without a male partner
   ii) Single - with a male partner who lives elsewhere
   iii) Living with your partner - Commonlaw
   iv) Married
   b) Are you and your and your husband presently living together?
   Yes No
   └Divorced Separated Widowed

7. How long have you and your husband/partner been together?

8. What is your ethnic origin?
   African East Indian Mixed Other _____

9. Do you work? (That is apart from keeping house)
   Yes No
   b) └What is your occupation?

10. What work does your husband/partner do?

11. At what level did your husband/partner leave school?
    i) Primary ii) Secondary iii) University iv) Don't Know

SECTION B

12. Do you have any children?
    Yes No
    b) └How many children have you ever had?
    c) How old is your first child? ___ Years
    d) How old is your last child? ___ Years

13. Forgetting the number of children you have at present, how may children do you think a woman should have in her lifetime?
    i) The number God gives her
    ii) The number she has
    iii) The number she wants
    iv) The number her husband/partner wants
    v) Don't Know
    vi) Number _____ Boys ___ Girls ___

14. Is there anything a woman can do to limit the number of children she has?
    Yes No
    b) └What can she do?

15. How do you feel about limiting the number of children a woman has?
    i) Totally in favour of it
    ii) It is okay
    iii) Totally against it
    iv) Other _____

16. Have you ever heard about family planning?
    Yes No
    b) └Where have you heard about it?
    Friend TV Radio Nurse Other _____

17. Have you ever heard about Family Planning Clinics?
    Yes No
    b) └Do you know if there is a family planning clinic in your community?
    Yes, there is No, there is't Don't know
    c) Do you attend the family planning clinic?
    Yes No
    └Why do you not attend _____

18. What do you think about the family planning clinics, especially the one in your community?

    _____

    _____

19. Are you and your husband/partner using contraceptives?
    Yes No
    b) Which method do you use?

Pill	I.U.D.	Abstinence
Condom	Diaphram	Aerosol
Abortion (Induced)	Injection	Douche
Temperature Rhythm	Withdrawal	Jelly/Cream
Calender Rhythm	Foam Tablet	Sponge Tampon
Breast Feeding	Suppository/Pessary	Other _____
Female Sterilization		
Male Sterilization		

20. (If the answer to Question 19 is 'No'.)
    What is your reason for not using any method to prevent or postpone a pregnancy?
    i) Do not know about anything that can be done
    ii) Cannot get pregnant again
    iii) Pregnant now
    iv) Want to get pregnant
    v) Disapprove of it
    vi) My husband/partner disapproves of it
    vii) Other _____

21. (For those who answered 'Yes' to Question 19.)
    Where do you go for advice on and supply for family planning?
    i) Family Planning Clinic
    ii) Private Doctor
    iii) Drug Store
    iv) Other _____

22. Do you feel that poverty, unemployment, poor housing are in any way related to the amount of children a woman has?
    Yes No
    Other _____

23. Which of the following do you do?
    i) Look at TV
    ii) Read the weekend newspaper
    iii) Read the daily newspaper
    iv) Listen to the radio
    v) Visit the community centre

BIBLIOGRAPHY

Agyei, William, K.A. 1978. "Modernization and the Theory of Demographic Transition in the Developing Countries: The Case of Jamaica." Social and Economic Studies, 27(1); 44-65.

Albuquerque, Mader K. and W. Stinner. 1976. "Modernization, Delayed Marriage and Fertility in Puerto Rico: 1950 to 1970." Social and Economic Studies, 25(1); 55-65.

Alvírez, David. 1973. "The Effects of Formal Church Affiliation and Religiosity on Fertility Patterns of Mexican-American Catholics." Demography, 10(1); 19-36.

Andrews, Norma. 1975. "Trinidad and Tobago." in Population Policies in the Caribbean, Aaron Segal, ed. Lexington: Lexington Books.

Baldwin, Wendy H. and Thomas R. Ford. 1976. "Modernism and Contraceptive Use in Colombia." Studies in Family Planning, 7(3); 75-79.

Baum, Gregory. 1969 "The Right to Dissent." in The Catholic Case for Contraception, Daniel Callahan. ed. London: The Macmillan Company.

Bavadra, T.U. and J. Kiershi. 1980. "Fertility and Family Planning in Fiji." Studies in Family Planning, 11(1); 17-23.

Berelson, Bernard, 1978. "Prospects and Programs for Fertility Reduction: What? Where?." Population and Development Review, 4(4); 579-616.

Berry, Brian. 1960. "An Inductive Approach to Regionalization of Economic Development." in Essays in Geography, Research Papers No. 62, Norton Ginsburg. ed. Chicago: University of Chicago.

Blake, Judith. 1965. "Demographic Science and The Redirection of Population Policy." Journal of Chronic Disease, 18; 1181-1200.

Blalock, Hubert, Jr. 1961. "Evaluating the Relative Importance of Variables." American Sociological Review, 26(6); 866-874.

Boldt, E.D. and A.H. Latif. 1976. "Contraceptive Careers: An Interactionist Approach to Fertility Regulating Behavior." Family Planning Research Project - University of Manitoba, Working Paper No. 5.

Bouvier, Leon F., and John J. Macisco, Jr. 1968. "Education of Husband and Wife and Fertility in Puerto Rico, 1960." Social and Economic Studies, 17(1); 49-59.

Boyd, Monica. 1973. "Occupational Mobility and Fertility in Metropolitan Latin America." Demography, 10(1); 1-16.

Brawer, Milton Jacob. 1965. Fertility Differences, Family Structure and Modernization in Two Populations in Trinidad. Michigan: University Microfilms Inc.

Cain, Glen G., and Adriana Weininger. 1973 "Economic Determinants of Fertility: Results from Cross Sectional Aggregate Data." Demography, 10(2); 205-221.

Caldwell, John C. 1978 "A Theory of Fertility: From High Plateau to Destabilization." Population and Development Review, 4(4); 553-577.

Caldwell, John., and Pat Caldwell. 1978 "The Achieved Small Family: Early Fertility Transition in an African Village." Studies in Family Planning, 9(1); 1-19.

Caldwell, John C., et al. 1970 A Manual For Surveys of Fertility and Family Planing: Knowledge, Attitude and Practice. New York: The Population Council.

Callahan, Daniel. ed. 1969. The Catholic Case for Contraception. London: Collier - Macmillan Ltd.

Carleton, Robert. 1965. "Fertility Trends and Differential in Latin America." Milbank Memorial Fund Quarterly, 43(4); 15-35.

Central Statistical Office. 1975. Social Indicators. Port-of-Spain: Trindad and Tobago.

Chan, K. C. 1976. "The Role of the Family Planning Association in Hong Kong's Fertility Decline." Studies in Family Planning, 7(10); 284-289.

Chow, L. P. 1970. "Family Planning in Taiwan, Republic of China: Progress and Prospects." Population Studies, 24(3); 339-352.

Clifford, William B. H. 1971. "Modern and Traditional Value Orientation and Fertility Behavior: A Social Demographic Study." Demography, 8(1); 37-48.

Collver, Andrew O., Alden Speare Jr., and Paul K. C. Liu. 1967. "Local Variations of Fertility in Taiwan." Population Studies, 20(3); 329-342.

Collver, Andrew O. 1968. "Women's Work Participation and Fertility in Metropolitan Areas." Demography, 5(1); 55-60.

Concepción, Mercedes B. 1974. "Female Labour Force Participation and Fertility." International Labour Review, 109(5-6); 503-517.

Cutright, Phillips, Michael Hout and David R. Johnson. 1976. "Structural Determinants of Fertility in Latin America: 1800-1970." American Sociological Review, 41; 511-527.

Davidson, Maria. 1978. "Female Work Status and Fertility in Latin America." Social and Economic Studies, 27(4); 481-506.

Davis, Kingsley and Judith Blake. 1956. "Social Structure and Fertility: An Analytic Framework." Economic Development and Cultural Change, 4; 211-235.

Demerath, Nicholas J. 1976. Birth Control and Foreign Policy: The Alternatives to Family Planning. New York: Harper and Row Publishers.

Denton, Hazel E. 1979. "Economic Determinants of Fertility in Jamaica." Population Studies, 33(2); 294-305.

Dixon, C. and B. Leach. "Sampling Methods for Geographical Research." Concepts and Techniques in Modern Geography. No 17. London: Institute of British Geographers.

Donaldson, Theodore S. 1968. "Robustness of the F-Test to Errors of Both Kinds and the Correlation between the Numerator and Denominator of the F-Ratio." Journal of the American Statistical Association, 63; 660-676.

Dunn, Olive and Clarke, Virginia. 1974. Applied Statistics: Analysis of Variance and Regression. New York: John Wiley and Sons.

Ebanks, G. Edward. 1973. "Fertility, Union Status and Partners." International Journal of Sociology of the Family, 3(1); 49-69.

Ebdon, David. 1977. Statistics in Geography. Oxford: Basil Blackwell.

Eberdstadt, Nick. 1980. "Recent Declines in Fertility in Less Developed Countries, and What 'Population Planners' May Learn from Them." World Development, 8; 37-60.

Elizaga, Juan C. 1974. "The Participation of Women in the Labour Force in Latin America: Fertility and Other Factors." International Labour Review, 109(5-6); 519-538.

Ellis, Maureen Yvonne. 1972. Family Structure, Fertility and Family Planning Programs in the West Indies: A Bibliographic Essay. Unpublished Thesis: Cornell University.

Family Planning Today. 1976 - 1979.

Farooq, Ghazi M., and Baran Tuncer. 1974. "Fertility and Economic and Social Development in Turkey: A Cross-Section and Time Series Study." Population Studies, 28(2); 263-276.

Finkle, Jason L., and Barbara B. Crane. 1975 "The Politics of Bucharest." Population and Development Review, 1(1); 87-114.

Flegg, A. T. 1979. "The Role of Inequality of Income in the Determinants of Birth Rates." Population Studies, 33(3); 457-473.

Foreit, K. G., K. S. Koh and M. H. Suh. 1980. "Impact of The National Family Planning Program on Fertility in Rural Korea: A Multivariate Areal Analysis." Studies in Family Planning, 11(3); 79-90.

Friedlander, D., Z. Eisenbach and Calvin Goldscheider. 1975. "Modernization Patterns and Fertility Change: The Arab Population of Israel and the Israel-Administered Territories." Population Studies, 23(2); 239-254.

Friedlander, Stanley and Morris Silver. 1967. "A Quantitative Study of the Determinants of Fertility Behavior." Demography, 4(1); 31-61.

Glass, Gene V. and Julian C. Stanley. 1970. Statistical Methods in Education and Psychology. New Jersey: Prentice Hall Inc.

Goldstein, Sidney. 1972. "The Influence of Labour Force Participation and Education on Fertility in Thailand." Population Studies, 26(3); 419-436.

Goode, William J. 1967. "Illegitimacy, Anomie and Cultural Penetration." American Sociological Review, 26(6); 910-925.

Green, Ronald, M. 1976. Population Growth and Justice. Montana: Scholars Press.

Groat, H. Theodora, Randy L. Workman and Arthur G. Neal. 1976. "Labor Force Participation and Family Formation: A Study of Working Mothers." Demography, 13(1); 115-125.

Harewood, Jack. 1968. "Recent Population Trends and Family Planning Activity in the Caribbean." Demography, 5(2); 874-893.

Harewood, Jack. 1975. The Population of Trinidad and Tobago. Port-of-Spain: C.I.C.R.E.D. Series.

Harewood, Jack, and Norma Abdulah. 1971. Family Planning in Trinidad and Tobago in 1970, University of the West Indies: Institute of Social and Economic Studies.

Heer, D. M., and E. S. Turner. 1965. "Areal Differences in Latin American Fertility." Population Studies, 14(3); 218-234.

Helwig, Jane T. and Kathryn A. Council. 1979. SAS User's Guide. Raleigh: Sas Institute Inc.

Hull, Terence H., Valerie J. Hull and Masri Singarimbum. 1977. "Indonesia's Family Planning Story: Success and Challenge." Population Bulletin, 32(6); 1-52.

Hunte, D. C. 1975. "A Look at Recent Fertility Trends in Trinidad and Tobago: 1960-70." An Unpublished Paper.

Huntsberger, David V. and Patrick Billingsley. 1974. Elements of Statistical Inference. 3rd ed. Boston: Allyn and Bacon Inc.

Iutaka, S., E. W. Boch and W. G. Varnes. 1975. "Factors Affecting Fertility of Natives and Migrants in Urban Brazil." Population Studies, 25(1); 55-62.

Jaccard, James J., and Andrew R. Davidson. 1976. "The Relation of Psychological, Social and Economic Variables to Fertility Related Decision." Demography, 13(3); 329-338.

Jaffe, A. J. and K. Azumi. 1960. "The Birth Rate and Cottage Industries in Underdeveloped Countries." Economic Development and Cultural Change, 9(1); 152-163.

Jaffe, Friederick S. 1974. "Bucharest: The Tests Are Yet To Come." Family Planning Perspectives, 6(4); 213-216.

Janowitz, Barbara, S. 1976. "An Analysis of the Impact of Education on Family Size." Demography, 13(2); 189-198.

Johnson, Timothy J. 1979. "Influences on Family Planning Acceptance: An Analysis of Background and Program Factors in Malaysia." Studies in Family Planning, 10(1); 15-24.

Jones, Huw R. 1977. "Fertility Decline in Barbados: Some Spatial Consideration." Studies in Family Planning, 8(6); 157-163.

Kasarda, John O. 1971. "Economic Structure and Fertility: A Comparative Analysis." Demography, 8(3); 307-317.

King, Leslie. 1968. Statistical Analysis in Geography. New Jersey: Prentice Hall.

Kirk, Dudley. 1972. "A New Demographic Transition?" in Rapid Population Growth, National Academy of Sciences - Research Papers. Baltimore: John Hopkins Press 123-147.

Kish, Leslie. 1967. Survey Sampling. New York: John Wiley and Sons Inc.

Kupinsky, Stanley. 1971. "Non-Familial Activity and Socio-Economic Differentials in Fertility." Demography, 8(3); 353-367.

Leach, Chris. 1979. Introduction to Statistics: A Nonparametric Approach for the Social Sciences. Chichester: John Wiley and Sons Ltd.

Leibenstein, Juan C. 1974. "Socio-Economic and Fertility Theories and Their Relevance to Population Policy." International Labour Review, 109(5-6); 443-457.

Levin, Jack. 1973. Elementary Statistics in Social Research. New York: Harper and Row Publishers Inc.

Lo, Oliver. 1976. Underlying Factors of Fertility Decline in Quebec: 1951-1971. M.A. Thesis - University of Manitoba.

Massey, Douglas S., and Lucky M. Tedrow. 1976. "Economic Development and Fertility: A Methodological Re-Evaluation." Population Studies, 30(3); 429-437.

Mauldin, Parker W., and Bernard Berelson. 1978. "Conditions of Fertility Decline in Developing Countries, 1965-75." Studies in Family Planning, 9(5); 90-147.

McShine, U. 1976. "Country Profile - Trinidad and Tobago." Unpublished Paper.

Ministry of Health. National Family Planning Reports. 1971-1976. Trinidad and Tobago Government.

Morris, Leo, et al. 1978. "Contraceptive Practice in Paraguay." Studies in Family Planning, 9(10); 272-279.

Mueller, Eva. 1972. "Economic Motives for Family Limitation: A Study Conducted in Taiwan." Population Studies, 26(3); 383-403.

Namboodiri, N. Krishnan. 1972. "Some Observations on the Economic Framework for Fertility Analysis." Population Studies, 26(2); 185-206.

Namboodiri, N. Krishnan. 1972. "The Integrative Potential of a Fertility Model: An Analytical Test." Population Studies, 26(3); 465-485.

Nie, Norman H. et al. 1975. SPSS - Statistical Package for Social Sciences New York: McGraw-Hill Book Company.

Norcliffe, G. B. 1977. Inferential Statistics for Geographers. New York: John Wiley and Sons.

Nortman, Dorothy. 1977 "Changing Contraceptive Patterns: A Global Perspective." Population Bulletin, 32(3).

Oechsli, Frank W., and Dudley Kirk. 1975. "Modernization and the Demographic Transition in Latin America and the Caribbean." Economic Development and Cultural Change, 23(3); 391-419.

Peterson, William. 1975. Population. 3rd ed. New York: Macmillan Publishing Co. Inc.

Pinnelli, Antonella. 1971. "Female Labour and Fertility in Relationship to Contrasting Social and Economic Conditions." Human Relations, 24(6); 603-610.

Population Reports: Family Planning Programs. Series J-2(1974), J-12(1976), J-17(1977).

Powell, Dorian. 1976. "Female Labour Force Participation and Fertility: An Exploratory Study of Jamaican Women." Social and Economic Studies, 25; 234-258.

Ridley, Jeanne Clare. 1968. "Demographic Change and the Roles and Status of Women." The Annals of the American Academy of Political and Social Science, 375; 15-25.

Roberts, G. W. 1967 "Reproductive Performance and Reproductive Capacity in Less Industrialized Societies." The Annals of the American Academy of Political and Social Science, 369; 37-47.

Roberts, G. W. 1968. "The Present Fertility Position in Jamaica." in World Views of Population Problems, Egon Szabady, ed. Budapest: Akademiai Kiado.

Roberts, G. W. and L. Braithwaite. 1961. "A Gross Mating Table for a West Indian Population." Population Studies, 14(3); 198-217.

Robinson, Warren C. 1961. "Urban-Rural Differences in Indian Fertility." Population Studies, 14(3); 218-234.

Rosen, Bernard C., and Alan B. Simmons. 1971. "Industrialization, Family and Fertility: A Structural - Psychological Analysis of the Brazilian Case." Demography, 8(1); 49-69.

Rosenzweig, Mark R. 1976. "Female Work Experience, Employment Status and Birth Expectations: Sequential Decision-Making in the Philippines." Demography, 13(3); 339-356.

Ruben, Vera. ed. 1960. "Social and Cultural Pluralism in the Caribbean." Annals of the New York Academy of Science, 83.

Scott, Joseph W. 1967. "Sources of Social Change in Community, Family and Fertility in a Puerto Rican Town." American Journal of Sociology, 72(5); 520-529.

Silk, John. 1979. Statistical Concepts in Geography. London: George Allen and Unwin Ltd.

Srikantan, K. S. 1977. The Family Planning Program in the Socio-Economic Context. New York: The Population Council.

Steel, Robert G. and James H. Torrie. 1960. Principles and Procedures of Statistics. New York: McGraw-Hll Book Company Inc.

Stinner, William F., Klaus de Alburquerque and Paul D. Mader. 1975. "Metropolitan Dominance and Fertility Change in Puerto Rico 1950-1970." Social and Economic Studies, 24(4); 433-444.

Stycos, J. Mayone. 1968. Human Fertility in Latin America. Ithaca: Cornell University Press.

Stycos, J. Mayone 1978. "Recent Trends in Latin American Fertility." Population Studies, 32(3); 407-425.

Stycos, J. Mayone and Kurt W. Back. 1964. The Control of Human Fertility in Jamaica. Ithaca: Cornell University Press.

Stycos, J. Mayone and Robert H Weller. 1967. "Female Working Roles and Fertility." Demography, 4(1); 210-217.

Sun, Te-Hsiung, Hui-Sheng Lin and Ronald Freedman. 1978. "Trends in Fertility, Family Size Preferences and Family Planning Practice: Taiwan: 1961-76." Studies in Family Planning, 9(4); 54-70.

Taylor, Peter, J. 1977. Quantitative Methods in Geography. Boston: Houghton Mufflin Company.

Terry, Geraldine B. 1975. "Rival Explanations in the Work-Fertility Relationship." Population Studies, 29(2); 191-205.

Tien, H. Yuan. 1967. "Mobility, Non-Familial Activity and Fertility." Demography, 4(1); 218-227.

Tien, H. Yuan. 1968. "The Intermediate Variables, Social Structure and Fertility Change: A Critique." Demography, 5(1); 138-157.

Tietelbaum, Michael S. 1975. "Relevance of Demographic Transition Theory for Developing Countries." Science, 188(2); 420-425.

Tsui, Amy Ong and Donald Bogue. 1978. "Declining World Fertility: Trends, Causes, Implications." Population Bulletin, 33(4); 1-56.

United Nations. 1953. The Determinants and Consequences of Population Trends. New York: Population Studies.

Weiss, Robert S. 1968. Statistics in Social Research: An Introduction. New York: John Wiley and Sons.

Weller, Robert H. 1968a. "The Employment of Wives, Dominance and Fertility." Journal of Marriage and the Family, 30(3); 437-442.

Weller, Robert. 1968b. "The Employment of Wives, Role Incompatability and Fertility: A Study Among Lower and Middle Class Residents of San Juan, Puerto Rico." Milbank Memorial Fund Quarterly, 46(1); 507-526.

Westoff, Charles F. and Elsie F. Jones. 1979. "The End of 'Catholic' Fertility." Demography, 16(2); 209-217.