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Evaluation of the Guyana Fertility Survey 1975

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The World Fertility Survey is an international research programme whose purpose is to assess the current state of human fertility throughout the world. This is being done principally through promoting and supporting nationally representative, internationally comparable, and scientifically designed and conducted sample surveys of fertility behaviour in as many countries as possible.
The WFS is being undertaken, with the collaboration of the United Nations, by the International Statistical Institute in cooperation with the International Union for the Scientific Study of Population. Financial support is provided principally by the United Nations Fund for Population Activities and the United States Agency for International Development.
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Preface

One of the major objectives of the World Fertility Survey programme is to assist the participating countries in obtaining high quality data through national fertility surveys. The high standards set by the WFS are expected to yield better quality data than typically obtained in the past, but this expectation in no way obviates the need for a detailed assessment of the quality of the data. It is recognized that such an evaluation will not only alert the analysts by identifying defects, if any, in the data, but also may throw light on the shortcomings of the WFS approach, which can be taken into account in the design of future fertility surveys.

It is in this context that, as part of its analysis policy, the WFS has initiated a systematic programme for a scientific assessment of the quality of the data from each survey. A series of data evaluation workshops are being organized at the WFS London headquarters with the dual objective of expediting this part of the work and of providing training in techniques of analysis to researchers from the participating countries. Working in close collaboration with WFS staff and consultants, participants from four or five countries evaluate the data from their respective surveys after receiving formal training in the relevant demographic and data processing techniques.

The second such workshop, involving researchers from five countries – Guyana, Indonesia, Jordan, Malaysia and the Philippines – was held between January and April in 1979. The present document reports on the results of the evaluation of the data of the Guyana Fertility Survey of 1975 and was prepared by Sundat Balkaran, the participant from Guyana. Abdullah Abdul-Aziz, Florentina Reyes, Bondan Supraptilah and Masitah Mohd. Yakim, the other participants, contributed to the present evaluation through their ideas and discussions.

Dr Shea Oscar Rutstein, as the co-ordinator of the workshop, assumed a major responsibility in the successful completion of the work, while many other staff members also made significant contributions to it. Dr Noreen Goldman provided valuable assistance as consultant.

DIRK J. VAN DE KAA
Project Director

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I also wish to acknowledge the invaluable assistance of Aqeel Ahmad of the Data Processing Division of WFS who taught me how to use the computer facilities, and the help of several other people in the Division, including Judith Rattenbury, Bogale Demissie, Sakina Harji, Anh Thu Dinh, and Mick Pearce, who provided continuous assistance with the computer analysis. My gratitude is also extended to other WFS staff for their useful discussions and comments on evaluation of survey data.

My thanks are also due to Chris Langford, Lecturer in Demography and my own supervisor at the London School of Economics and Political Science, for granting me permission to participate in the Asian Workshop and for his encouragement and interest in the evaluation exercise. Credit must also be given to my colleagues in the Asian Workshop and the University of London for their support in this project.

Finally, I am grateful to the Government of Guyana, in particular to the Statistical Bureau headed by Bertram Bowman, for permission to undertake this analysis and for the use of the data tape.

1 Introduction

1.1 THE POPULATION OF GUYANA

Guyana is an English-speaking country on the north east of the South American continent flanked by three other countries: Venezuela, Brazil and Surinam. It is 83 000 square miles (214 969 square kilometres) in area with an enumerated population of 699 848 in 1970. More than 90 per cent of the total population lives on the narrow low-lying coast (270 miles long and 10–40 miles wide). Behind the coast, vast areas are under tropical forest and are mostly uninhabited or sparsely populated by native Indians (also known as Amerindians).

The population is composed of two major ethnic groups, Africans (31 per cent) and East Indians (52 per cent) who are the descendants of immigrants brought as slaves or indentured labourers, from Africa and India respectively, for the sugar plantations during the colonial era. The remainder of the population (17 per cent) consists of several other ethnic minority groups such as the native Indians (5 per cent); Chinese, Portuguese and other Europeans (2 per cent); and people of mixed descent (10 per cent) (1970 census). Significant differences in fertility behaviour, attitudes, customs, institutions and other social characteristics among the different ethnic groups suggest separate demographic analyses for the major groups.

Population growth has been quite rapid since the first quarter of this century especially during the post war period (1946–60) which recorded a growth rate of over 3 per cent per annum. The high growth rate is due to very high birth rates (particularly for the East Indians) as well as to substantial reductions in mortality. From 1951–60 the crude birth rate was over 42 per 1000 and the death rate was about 12 per 1000. Evidence from vital statistics suggests a decline in fertility since the mid-1960s; the estimated crude birth rate in 1975 was 29.7 per thousand live births and the total fertility rate declined between 1961 and 1975 from 6.0 to 3.4 children per woman.

The proportion of the population classified as urban was 29.4 per cent in 1970, an increase of 4.4 per cent since 1931. The process of modernization of the rural communities is well advanced, facilitated by their geographical and physical setting on the coast and hence close proximity to the urban centres as well as by an efficient communication network.

1.2 THE GUYANA FERTILITY SURVEY

The Guyana Fertility Survey (GFS) was conducted in 1975 as part of the World Fertility Survey (WFS) programme in order to obtain estimates of fertility levels and patterns. The survey was organized within the Caribbean Programme of the WFS. Fieldwork commenced in May and concluded in September 1975.

The GFS was the first national demographic survey in Guyana to collect information on the fertility behaviour of the population. Previous demographic estimates have been available from censuses and vital registration. However, constraints on the detail, quality, and completeness of the data obtained from these traditional sources may limit the usefulness of the resulting estimates. It is hoped that the GFS will provide a valuable source of data for analyses of fertility patterns and levels and, in addition, for the planning of social and economic development (Statistical Bureau, Ministry of Economic Development 1979).

The study population covered approximately 92 per cent of the population of Guyana enumerated in the 1970 census. Most of the excluded population resided in the remote and inaccessible areas of the country. In keeping with the standard practice of surveys sponsored by the WFS, there was a household survey as well as a detailed individual survey. From a stratified sample of 4681 households, 4432 households (94.7 per cent) were successfully interviewed, with most of the non-response accounted for by vacant dwellings found at the stage of interviewing. The percentage of completed interviews was 92.7 per cent for urban and 95.9 per cent for rural areas.

The household survey was based on the *de jure* population and collected basic data on the following characteristics: age, sex, relationship to the head of household, school attendance (for persons 15–19 years old), and the possession of selected consumer durables. The primary purpose of the household schedule was to provide a listing of the respondents who were eligible for the detailed individual survey. Questions relating to fertility, marital status, level of education, etc, which were included in some other WFS household surveys, were omitted from the household survey of the GFS.

The individual questionnaire was administered to all women in the households who were 15–49 years old, regardless of marital status, except for females aged 15–19 years who were currently in full-time primary or secondary school. In this respect the GFS also differed from some other WFS surveys in that eligibility was not restricted to ever-married women (or to women ever in a union). A total of 4858 women were eligible for the detailed interview and 4642 questionnaires (95.6 per cent) were successfully completed and processed. Of these 4642 women, 1026 had never been in a union. As was the case for the household survey, the response rate was slightly higher in rural (97.8 per cent) than in the urban areas (96.0 per cent).

From the individual questionnaire, detailed information was collected on the respondent's nuptiality and pregnancy histories, including the date and type of each union, the date of birth of each child (and date of death where applicable), as well as data on breastfeeding, family planning, and some socio-economic variables. Since many of these data had not been available prior to the GFS, they offer

the possibility of a better understanding of demographic behaviour in Guyana.

However, experience from other retrospective surveys in developing countries has shown that the information collected from surveys may be subject to response errors which bias the resulting estimates. Response errors arise mainly from misreporting of age and the omission and displacement of vital events, as described in more detail in section 1.3 below (Brass and Coale 1968; Potter 1977; Goldman, Coale and Weinstein 1979). The usefulness of the survey data in providing reliable estimates of the demographic parameters depends on the extent to which they are affected by response errors and the detection of possible sources of bias. The purpose of this analysis is to evaluate the quality of the data obtained from the Guyana Fertility Survey: ie to determine the accuracy of the data and to delineate some of the errors in the reporting of age, dates and vital events in the pregnancy and nuptiality histories, as well as to determine the extent to which these errors can bias the estimates.

The present analysis will be confined to an evaluation of data in the individual questionnaire and will involve checks of internal consistency as well as comparisons with other sources of data (ie the censuses and vital registration). Checks for response consistency which could be obtained through a match of the household and individual questionnaires (eg Guzmán 1980; Flórez and Goldman 1980) are not feasible here, because of the very limited schedule used in the household survey. Throughout this evaluation, we shall assume that females who were not considered for the individual survey (ie those at school) were single and had never borne a child. In order to obtain the various demographic estimates for the cohort aged 15–19 years, denominators of rates were adjusted to take account of this excluded group of women.

Since the GFS was the first demographic survey to enquire deeply into the personal lives of women and their families, one might well be sceptical of the accuracy of these data. However, certain features of Guyanese society should have a positive effect on the reporting of dates and events. First is the fairly high level of literacy and education. According to the GFS, more than 85 per cent of the eligible respondents had four years or more of formal education. Secondly, the dates of most vital events and anniversaries have special cultural significance in Guyana. Thirdly, there is a well-established vital registration system which requires the recording of the dates of all vital events. Finally, the quality of the GFS field staff appeared to be remarkably high: almost all of the field supervisors were school teachers with previous experience in census operations and most of the enumerators were public health nurses or school teachers.

Perhaps these factors have resulted in the relatively high level of completeness of date reporting in the GFS. Although completeness of reporting need not be prerequisite for accuracy, there is some evidence of such a relationship (Goldman, Coale and Weinstein 1979). Date reporting in the GFS was 98 per cent complete (ie both calendar year and month stated) for the reporting of the respondents' birth and more than 90 per cent complete in the pregnancy histories, but only about 80 per cent complete for the onset of unions (see table 1).

1.3 TYPES OF ERROR

As noted previously, data collected from retrospective fertility surveys may be affected by various types of error which may bias demographic measures. These errors arise from various sources such as faults in the design of the questionnaire, lack of knowledge among respondents, misinterpretation of the questionnaire, memory lapse, or poor interaction between respondent and interviewer. For the present analysis we focus on the following three types of errors: misreporting of the age of the respondent, omission of vital events, and displacement of dates of vital events.

Misreporting of age of respondents

Respondents may misreport their ages as a result of preferences for ages ending in certain terminal digits at the expense of others. For example, in both the Nepal and Dominican Republic Fertility Surveys, respondents showed preferences for ages divisible by 5 and 2 (Goldman, Coale and Weinstein 1979; Guzmán 1980). More significantly, errors in reporting current age may also arise from the ten-

Table 1 Reporting of Date of Occurrence for Specific Events in the Individual Survey (Per Cent Distribution)

Event	Type of date					
	Month and year	Year only	Age only	Years ago only	Duration only	Sample size (100%)
1 Respondent's birth	98.0	0.3	1.7	–	–	4642
2 All live births	91.0	4.0	–	5.0	–	16716
3 First live birth	95.0	1.3	–	3.7	–	3272
4 Last live birth	93.4	2.8	–	3.8	–	3272
5 Next to last live birth	91.6	3.5	–	4.5	–	2793
6 Beginning of all unions	81.6	6.7	11.6	–	–	6245
7 Dissolution of all unions	81.2	8.0	–	–	10.8	3029
8 Beginning of first union	78.7	6.2	15.1	–	–	3616
9 Beginning of current union	92.9	2.7	4.4	–	–	3216

Source: GFS 1975.

dency of respondents to declare themselves younger or older than their true ages (ie age transference). In Latin America, Mortara (1964) has shown that women tend to report themselves younger than their true ages. In other societies, older people have a tendency to exaggerate their ages. These errors may produce distorted estimates of the demographic parameters. For example, if age misreporting is selective of women with certain characteristics (eg high parity women, married women, etc), it can produce significant distortions in the fertility estimates (see, for example, Guzmán 1980).

Omission of vital events

A common error in surveys is failure to report births, infant deaths, and first marriages. Frequently, older women omit births and infant deaths which occurred in the more remote past because of memory lapse or misinterpretation of the question. Since omission errors are generally more prevalent in the remote past they may produce a false impression of levels and trends in fertility, mortality and nuptiality. For example, omissions of first marriages would result in the recording of a later union as the first union and thereby produce an upward bias in the estimated age at first marriage.

Displacement of dates of vital events

A third major error observed in fertility surveys arises from displacement of the time of occurrence of past vital events. (Brass 1978 and 1980, Potter 1977). Potter (1977) has shown that, in maternity histories, displacement of births in the remote past may result in a concentration of births in periods closer to the survey date and thereby create an artificial impression of a rise in fertility and of a subsequent decline. Analyses of fertility data from a number of WFS surveys have shown evidence of displacement of dates of births toward the survey date, mostly among the oldest cohorts (Chidambaram *et al* 1980). The trend and age patterns of infant mortality and nuptiality can also be distorted by event displacement.

These three types of response errors are interrelated and one type may be indistinguishable from another. Errors of omission and event displacement may distort the estimates in a similar manner: eg omission of early births and displacement of dates of early births toward the survey date may each create a false impression of a rise in fertility in the past. In addition, respondents who exhibit one type of reporting error may be more likely to exhibit other types of errors (see, for example, Goldman, Coale and Weinstein 1979, for results of the Nepal Fertility Survey). In the following sections, errors of omission and displacement will be assessed within demographic subject: age reporting, nuptiality, fertility, and infant and child mortality.

2 Age Reporting

Previous experience has indicated that age misreporting can distort demographic data collected from surveys and censuses in developing countries. It arises from the tendency of respondents or enumerators to overstate or understate the true ages of the respondents (age transference) or to report ages on certain preferred digits (age heaping). Inaccurate reporting of age can cause distortion of the age distribution, and bias the estimates of fertility, nuptiality and other demographic variables. For example, Goldman, Coale and Weinstein (1979) found that respondents in the Nepal Fertility Survey had ages heaped on digits divisible by 2 and 5; this was particularly true for respondents who were not able to supply a date of birth. They also found that women in Nepal who misreport their age were more likely to omit births and to misreport their marriage duration.

Evidence from the two most recent censuses in Guyana (1960 and 1970) suggests that age reporting, measured by degree of heaping on preferred digits, is fairly reliable. Table 2 presents Myers' indices (measures of number preference) for both censuses. The indices are low for both censuses for males and females, suggesting that reported ages were generally accurate. The deviations from 10 per cent of Myers' Blended Index were not large, although there is some preference for digits 0 and 8, and to a lesser extent 5, and an aversion to the digit 1. The pattern of digit preference is similar for males and females.

Based on the quality of age reporting in the censuses one would expect high quality of age reporting in the GFS. A comparison of the age distribution from the household survey of the GFS and from the censuses is not possible because data on age in the household survey are classified in 15 year intervals or more. However, the single year age distribution of women aged 15–49 years is available from the individual questionnaire for investigation of the quality of age reporting.

Respondents in the individual survey were initially asked the month and year of their birth, but those who could not supply this information were subsequently asked to estimate their current age; 98 per cent of the women reported their date of birth completely whereas age was estimated for the remaining two per cent. The high percentage of women who reported their date of birth suggests considerable awareness of birth events, which is in part a consequence of well established birth registration and national identification systems as well as of a relatively high level of literacy and education.

In figure 1 the single-year age distribution of the interviewed women (GFS) is compared with those of women in the same age range from the 1960 and 1970 censuses. There is general agreement among the three distributions particularly among women over 30 years old. The GFS age distribution for younger women shows more irregularity than the corresponding age distributions from the censuses.

Table 2 Per Cent Distribution for Digit Preference, Deviation from 10 Per Cent and Myers' Index, Calculated for Males and Females over the Age Range 10–79 Years: 1960 and 1970 Censuses of Guyana

Digit	Per cent distribution				Deviation from 10 per cent			
	1960 census		1970 census		1960 census		1970 census	
	Male	Female	Male	Female	Male	Female	Male	Female
0	12.1	12.1	11.0	11.0	+2.1	+2.1	+1.1	+1.0
1	8.0	7.4	8.5	8.3	−2.0	−2.6	−1.5	−1.7
2	10.1	10.2	10.1	10.2	+0.1	+0.2	+0.1	+0.2
3	9.1	9.3	9.5	9.6	−0.9	−0.7	−0.5	−0.4
4	10.4	10.3	10.2	10.0	+0.4	+0.3	+0.2	0
5	10.4	10.4	10.5	10.2	+0.4	+0.4	+0.5	+0.2
6	9.8	10.2	9.8	10.0	−0.2	+0.2	−0.2	0
7	9.2	9.1	9.9	9.6	−0.8	−0.9	−0.1	−0.4
8	9.4	11.1	10.4	9.5	+0.6	+1.1	+0.4	−0.5
9	9.8	10.0	10.1	10.6	+0.2	0	+0.1	+0.6
Myers' Blended Index[a]								
	7.7	8.5	4.6	5.0				

[a]Scale ranges from 0–180.

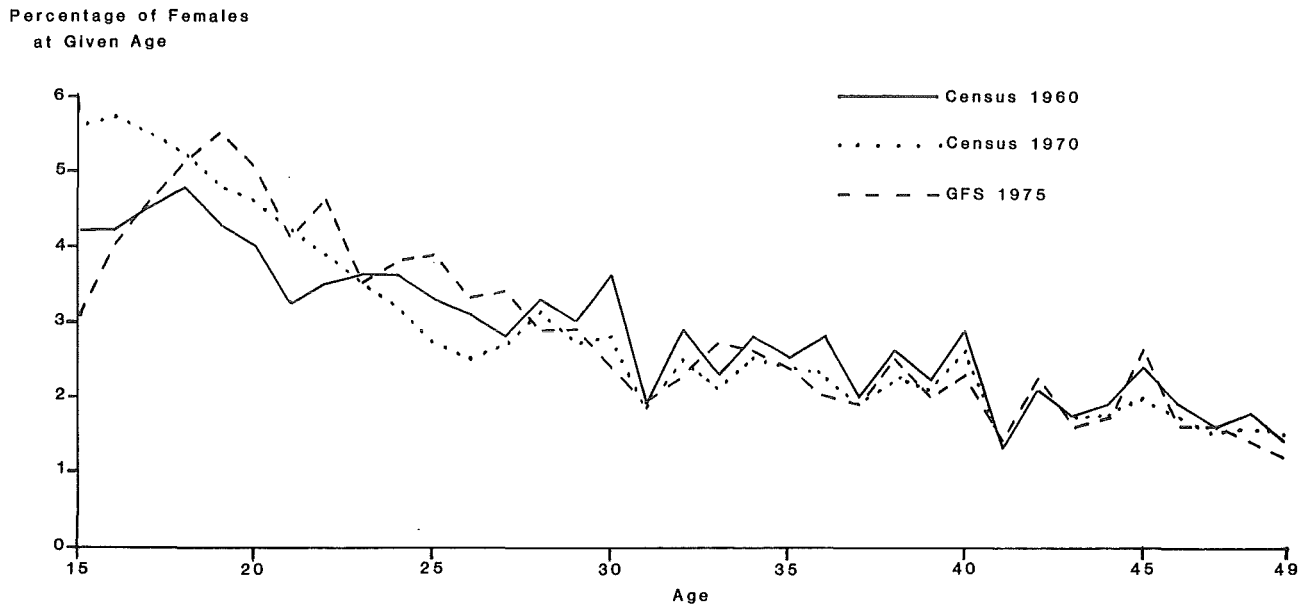

Figure 1 Reported Single-Year Age Distributions of Females for Ages 15–49 (in Per Cents), 1960 and 1970 Censuses and 1975 GFS

However, the rise in the age distribution from ages 15–19 is primarily the result of the selection procedure through which 15–19 year olds attending full-time school were not chosen for the detailed interview. Myers' indices in Table 3 (calculated for women 20–49 years) suggest no considerable age heaping in any of the three enquiries and reveal that reports of age were slightly better at the 1970 census than at the survey. An examination of the GFS distribution of respondents by year of birth (not shown) has not revealed any marked or systematic heaping. There is some slight indication of a common preference for digits according to analyses by both year of birth and age in completed years, but heaping appears generally smaller in the former instance.

There is evidence that age reporting is somewhat different among various subgroups in the population although the basic pattern of preferences generally persists. There is no large difference in Myers' Index between urban (12.9) and rural women (10.1). With minor exceptions, number preferences according to level of education follow the same trend as for all women; as expected, the better educated women show less evidence of age misreporting than those with lower education (not shown). An analysis of age reporting for Indians and non-Indians suggests that Indians were less likely to report ages on preferred digits although the non-Indian population is generally better educated (not shown).

As mentioned before, a more critical problem in age reporting is the systematic transference of age (age shifting), especially if the phenomenon is related to marital status or

Table 3 Per Cent Distribution for Digit Preference, Deviation from 10 Per Cent and Myers' Index, Calculated for Females over the Age Range 20–49 Years: 1960 and 1970 Censuses and GFS 1975

Digit	Per cent distribution			Deviation from 10 per cent		
	Census 1960	Census 1970	GFS 1975	Census 1960	Census 1970	GFS 1975
0	11.1	10.3	8.8	+1.1	+0.3	−1.2
1	6.3	7.1	6.9	−3.7	−2.9	−3.1
2	9.7	10.1	10.0	−0.3	+0.1	0
3	8.7	9.3	9.7	−1.3	+0.7	−0.3
4	10.3	10.2	10.3	+0.3	+0.2	+0.3
5	10.9	10.5	12.4	+0.9	+0.5	+2.4
6	11.0	10.1	9.8	+1.0	+0.1	−0.2
7	9.4	9.8	9.5	−0.6	−0.2	+0.5
8	11.8	11.6	11.1	+1.8	+1.6	+1.1
9	11.7	11.1	10.4	+1.7	+1.1	+0.4
Myers' Blended Index[a]						
	12.7	7.7	9.5			

[a]Scale ranges from 0–180.

fertility. Evidence from tropical Africa, for example, has revealed that childbearing women tend to move towards the centre of the fertile age distribution (United Nations 1967). Also Guzmán (1980), in evaluating the Dominican Republic Fertility Survey of 1975, has provided clear evidence of an apparent shift in the ages of respondents from the older age groups (40–44) to a younger age group (35–39). Although such shifts in ages may result in considerable distortions of the demographic estimates, they are difficult to measure and not easily detected.

Simple examination of the distribution (GFS) of respondents by age in completed years (figure 1) has not provided any firm evidence of a systematic transference of age in any particular direction. Also, further analysis of the mean number of children ever born (mean parity) by single years of age does not show any serious discrepancies which might be associated with transferences of respondents across the key age boundaries of 19/20, 24/25, etc.

Simple inspection of the relative sizes of the five year cohorts (see table 7, bottom row) suggests the possibility of a slight deficiency of women aged 30–34, but the analysis of cohort fertility in section 4.3 offers no confirmation of any transference out of this cohort; rather, the reverse is suggested, namely the transference of other women into the cohort.

To summarize, the reported age distributions for all women and for various subgroups of the population reveal some degree of age misreporting in the form of preferences for certain digits. In general, older women are most affected. However, the evidence from the observed age distributions and Myers' indices do not suggest any substantial distortions in these distributions which might affect the demographic estimates or the utilization of the survey data. The degree of misreporting is noticeably reduced when the single-year age distributions are presented in the conventional five-year age groups. Since most of the demographic measures in fertility, nuptiality and mortality are based on these age groups, estimates derived from the GFS should not be substantially distorted by age reporting errors although, as will be shown later, age-related distortions may not be entirely absent.

3 Nuptiality

An important aspect in fertility and nuptiality studies in Guyana, as well as in the Caribbean and Latin America in general, is type of union. As is not the case in many Western and Asian societies, a significant proportion of women are in non-legal forms of union. These are generally classified as common law (consensual) or as visiting unions. The former are distinguished by a sharing of a common household by the cohabiting couple who are not legally married. The visiting category is restricted to women who do not share a common household with, nor are married to, partners with whom they maintain sexual relations (Roberts 1975). These *de facto* unions are relatively less stable than marriages, the least stable being the visiting unions. Most Indians marry according to their customary religious rites. An increasing proportion of these customary marriages are being legalized, but there is no social distinction between customary and legal marriages. In this analysis (and in the censuses) the term 'marriage' refers to both customary and legal marriage.

According to data from 1970 census for Jamaica, nearly half of the women aged 15–49 years currently in a union were classified in *de facto* unions. In Guyana, the percentages were 17 and 29 according to the 1970 census and the GFS respectively. Lower proportions of women in *de facto* unions in Guyana compared with most other Caribbean and Latin American countries are in part due to a large East Indian population in Guyana (52 per cent in 1970). Among the Indians, the incidence of common law or visiting relationships has always been very low, marriage being widely perceived as the acceptable and established institution for mating and family formation. The data in table 4 show the much higher frequency of both common law and visiting unions among the non-Indians as compared with the Indian population. Data from the GFS reveal that among women aged 15–49 years currently in a union, 89 per cent of Indian women were married but only 50 per cent among the non-Indians (48 per cent among African women who constitute the largest subgroup among the non-Indians).

The different types of unions, characterized by varying degrees of stability and intensity of exposure to the risk of conception, have provided a useful methodological framework for analysing fertility differentials. However, many analyses have been inadequate because of the unavailability of detailed information on union formation. *De facto* unions often represent transition stages in the family life cycle, and many marriages are legalizations of formerly consensual or visiting unions of varying durations. Since only legal marriages are included in the vital registration data, there is no way of estimating from these data the extent to which married women were previously in *de facto* unions or the degree of stability of unions. In addition, census data provide only current distributions of marital status, and not information on participation in previous unions. In the light of these limitations of census and vital registration data, the nuptiality histories from the GFS make a significant contribution to available information on the mating system in Guyana.

As part of the individual questionnaire, a complete marriage or union history was obtained for each respondent including current union status, the date of onset of each union, type of union, and date of dissolution of union (if union dissolved). The respondents were asked to supply the month and year that each union started and where

Table 4 Per Cent Distribution of Women Aged 15–49 Years According to Type of Union and Ethnic Group

Age	Married		Common law		Visiting		Widowed, divorced, separated		Single	
	Indian[a]	Non-Indian	Indian	Non-Indian	Indian	Non-Indian	Indian	Non-Indian	Indian	Non-Indian
15–19	17.0	5.0	2.0	5.0	1.0	18.0	1.0	5.0	79.0	67.0
20–24	62.0	23.0	3.0	13.0	3.0	32.0	4.0	8.0	28.0	24.0
25–29	77.0	48.0	7.0	16.0	2.0	19.0	7.0	11.0	7.0	6.0
30–34	80.0	52.0	9.0	18.0	3.0	17.0	6.0	11.0	2.0	2.0
35–39	76.0	48.0	10.0	21.0	1.0	13.0	10.0	13.0	3.0	5.0
40–44	76.0	50.0	8.0	19.0	1.0	13.0	14.0	15.0	1.0	3.0
45–49	73.0	49.0	7.0	16.0	0.0	11.0	19.0	21.0	1.0	3.0
Total	56.0	33.0	5.0	13.0	1.0	19.0	6.0	10.0	32.0	25.0

[a]Includes only East Indians.
Source: GFS 1975.

applicable the month and year the union ended. As noted previously, date reporting in the nuptiality histories was less complete than in the pregnancy histories (see remarks on table 1). About 21 per cent of the respondents were unable to report completely the date of the first union but among them all were able to supply either the calendar year (6 per cent) or age at first union (15 per cent). No respondents had to estimate the duration of their first union.

The relatively high percentage of respondents who could not supply the dates of nuptiality events, in part due to the instability of early unions, points to the need for an evaluation of these data. In the following sections an attempt is made to assess the quality of the GFS data on nuptiality. The evaluation consists of an examination of the internal consistency of the data as well as of comparisons of GFS data with data available from the 1960 and 1970 censuses on union status distributions.

3.1 COMPARISON OF THE 1975 GFS WITH THE CENSUS FIGURES FOR 1960 AND 1970

Table 5 shows the per cent distribution of women within five-year age groups by current union status for the 1970 census and the 1975 GFS. Comparisons between the two sources suggest large differences in percentages in marriages and in visiting unions. For example, the proportion of all women 15–49 years old in visiting unions is 9.3 per cent according to the 1975 GFS, but only 1.9 per cent from the 1970 census; these differences occur within each age group. On the other hand, percentages in common law unions are fairly consistent between the two data sources.

Although it is possible that some of these differences are due to changes in age at marriage and changes in marital disruption rates between 1970 and 1975, it seems unlikely that Guyana experienced such large nuptiality changes during a five-year period. An examination of the percentages in visiting unions suggests different classification systems for visiting unions in the 1960 and 1970 censuses and in the GFS. This is in fact the case. The censuses classified women into visiting unions only if they had borne a child in the year preceding the census (and were not married or in a common law union). Those women in visiting unions who had not borne a child in the past year were classified as single (Census Research Programme Vol. 8, 1976). On the other hand, the GFS classified women into visiting unions irrespective of their fertility history. Since visiting unions are more common among younger women, and frequently give way to more stable forms at later ages, the discrepancies between the census data and the GFS data are largest for the younger age groups (particularly for women aged 20–24).

With the information on dates of union from the nuptiality histories in the GFS, it is possible to reconstruct the proportions of women who were ever in a union at any date in the past. Comparisons between the reported census distributions and reconstructed GFS distributions of marital status provide a better evaluation of the data, since they avoid the problems of actual changes in the distributions. Since no women older than 49 years at survey date were interviewed, the distribution derived from the GFS can be obtained only for women younger than 49 – x for a date x years in the past.

Table 6 shows the percentages of women by five-year age groups according to union status as of the 1960 and the 1970 census dates, reconstructed from the GFS data and as reported in the censuses. For this tabulation, visiting unions have been re-defined in accordance with the census definition, ie to include only women who had a child in the year preceding the census and who were not married or in common law union. With the exception of women aged 15–19 at the 1960 census date, the percentage of women in marriages, as reported in the censuses and as derived from the GFS, agree quite closely. Thus, much of the difference in percentages married shown in table 5 is due to an increase in age at marriage between 1970 and 1975 (see section 3.2). Note also that census and GFS estimates of percentages in visiting unions are quite similar and suggest that the discrepancies in table 5 are due to differences in definition.

However, some differences do remain in table 6. The higher percentage of 15–19 year olds who were married

Table 5 Per Cent Distribution of Women within Five-Year Age Groups by Current Union Status for the 1970 Census and the 1975 GFS

Age group	Married		Common law		Visiting		Widowed, divorced, separated		Single		Ever in union	
	1970 census	1975 GFS	1970 census	1975 GFS	1970 census	1975 GFS	1970 census	1975 GFS	1970 census	1975 GFS	1970 census	1975 GFS
15–19	14.0	12.2	2.8	2.9	1.9	7.7	0.7	2.1	80.6	75.2	19.4	24.8
20–24	50.1	44.1	8.3	7.6	3.3	16.0	3.4	6.1	34.9	26.2	65.1	73.8
25–29	70.0	63.4	10.6	10.9	2.1	9.7	5.6	8.7	12.6	7.3	87.3	92.7
30–34	71.6	68.8	11.7	12.6	1.4	8.3	8.0	8.3	7.1	2.0	92.7	98.0
35–39	71.4	64.3	11.9	14.7	1.0	6.3	10.1	11.3	5.5	3.4	94.5	96.6
40–44	66.8	63.4	11.9	13.5	0.4	6.8	14.8	14.3	5.9	2.0	94.1	98.0
45–49	64.7	59.7	10.6	11.7	0.1	6.1	18.3	20.4	6.1	2.0	93.9	98.0
Total	54.4	45.5	9.1	8.8	1.9	9.3	7.0	7.9	27.4	28.4	72.6	71.6

Sources: Census Research Programme 1976, vol 8, table 1; 1975 GFS.

Table 6 Union Status Distribution (in Per Cents) for Females by Five-Year Age Groups for Census Dates (1960 and 1970) from Reported Dates of Union in the 1975 GFS and from the 1960 and 1970 Censuses

Marital status	Ages 15–19		Ages 20–24		Ages 25–29		Ages 30–34		Ages 35–39		Ages 40–44	
	GFS	Census	GFS	Census	GFS	Census	GFS	Census	GFS	Census	GFS	Census
A 1960												
Single	56.1	70.3	21.9	28.9	10.1	14.0	6.2	10.2				
Married	33.9	22.8	58.3	54.7	66.6	65.9	69.9	67.3				
Common law	4.0	4.1	10.0	10.7	14.4	14.0	14.1	15.7				
Visiting	2.7	2.3	3.0	3.3	2.3	2.1	2.7	1.3				
Widowed/ divorced/ separated	3.3	0.5	6.8	2.4	6.6	4.0	7.1	5.5				
B 1970												
Single	75.1	80.6	27.9	34.9	7.3	11.7	5.9	7.3	4.8	5.6	4.6	6.1
Married	17.4	14.0	52.3	50.1	71.1	70.0	67.1	71.6	66.8	71.4	66.4	66.8
Common law	2.6	2.8	10.1	8.3	10.5	10.6	13.0	11.7	14.9	11.9	11.4	11.9
Visiting	1.8	1.9	2.6	3.3	1.8	2.1	1.2	1.4	0.7	1.0	0.3	0.4
Widowed/ divorced/ separated	3.1	0.7	7.1	3.4	9.3	5.6	12.8	8.0	12.8	10.1	17.3	14.8

Sources: Central Statistical Office 1967, vol III, part B, table 11; Census Research Programme 1976, vol 8, table 1; 1975 GFS.

as of the 1960 census date according to GFS data (34 per cent) as compared with census data (23 per cent) will be noted in a different context in section 3.2: the cohort aged 30–34 (at survey date) has higher percentages ever in union as of the young ages, as compared with all other cohorts (table 9). The possibilities of misreporting of age or of date of first union for this cohort seem high. It is of course possible that part of the discrepancy in table 6 is due to errors in the census which result in the classification of married teenage women as single.

We also note from table 6 that, for the young age groups (under 30–34), the percentages single are considerably higher as reported in the censuses than as derived from the GFS. Some of this discrepancy results from the slightly higher percentages married as derived from the GFS. Most of the difference, however, appears to be due to higher percentages formerly married (widowed, separated, or divorced) as derived from the GFS. The higher proportions formerly married reported in the GFS are at least partly due to the classification problem mentioned previously. Since the census classified women who were in visiting unions but who had no child in the year prior to the census as 'single', women who were separated from such unions were also classified as 'single' by the census. On the other hand, separated and divorced women in the GFS could have previously been in any of the three union types (visiting, common law and married).

In summary, a comparison of data in the nuptiality histories of the GFS with data reported in the censuses yields consistent estimates for percentages of women in marriages (with the exception of women aged 15–19 in 1960) and percentages in common law unions. If 'visiting unions' in the GFS are re-defined in accordance with census definitions, percentages in visiting unions as derived from the two data sources are also similar. The differences in percentages formerly married also appear to be due to classification differences. Hence, with the exception of the cohort 30–34, a comparison of GFS data with census data does not reveal any substantial errors in the reporting of dates of unions or of marital status in the survey. However, since the reconstructions have only been calculated for the 15 years prior to survey, the comparisons in table 6 do not yield information on the quality of nuptiality reports for the more distant past.

3.2 TRENDS IN AGE AT MARRIAGE BY COHORT AND PERIOD

The retrospective nuptiality data available from the GFS enable us to estimate and analyse cohort trends in age at first union. Using the data on date of first union, we can construct cumulative proportions ever in a union by age for five-year birth cohorts. These proportions are presented in table 7 for the cohorts aged 20–24, 25–29, 30–34, 35–39, 40–44 and 45–49 at the survey date. The marriage experience of each cohort is censored at the youngest age of the cohort since the cohort cannot experience marriages at an age greater than its current age. From the data in table 7 estimates of the mean age at marriage for marriages occurring before age 25 can be derived for the cohorts aged 25–29 and above. These estimates provide some indication of the trend in age at marriage. In addition, model first marriage schedules (Coale 1971) can be fitted to the first marriage frequencies to obtain estimates of marriage rates for the remainder of the cohorts' lifetime. The mean of the fitted model schedule provides an estimate of the mean age at first union for the whole childbearing period for each cohort. For the remainder of the analysis, we use the terms 'marriage' and 'union' interchangeably, unless specified to the contrary.

Table 8 presents the estimates of the mean age at

Table 7 Cumulative Proportion of Women Ever in a Union by Successive Ages (by Age at Survey)

Up to exact age	Age at survey					
	20–24	25–29	30–34	35–39	40–44	45–49
10	.002	.003	.004	.008	.000	.000
11	.005	.004	.015	.012	.009	.015
12	.011	.016	.026	.028	.021	.043
13	.035	.042	.051	.062	.070	.089
14	.085	.099	.132	.155	.133	.163
15	.189	.198	.260	.264	.254	.275
16	.306	.326	.412	.411	.422	.374
17	.426	.450	.533	.526	.560	.509
18	.534	.576	.629	.621	.644	.608
19	.617	.684	.732	.718	.719	.692
20	.679	.752	.786	.787	.768	.776
21		.798	.844	.847	.833	.819
22		.841	.898	.867	.866	.847
23		.882	.932	.887	.889	.880
24		.902	.948	.907	.917	.890
25		.916	.955	.955	.931	.903
26			.966	.929	.945	.908
27			.970	.943	.950	.928
28			.974	.949	.952	.941
29			.978	.949	.959	.946
30			.978	.953	.959	.951
Number of women	978	760	554	504	429	392

Source: GFS 1975.

marriage for marriages occurring before age 25 and estimates derived from the fitted model schedules. The estimates suggest that over a period of approximately 20 years in the past there has been virtually no increase in age at marriage. However, estimated mean ages at marriage for the two youngest cohorts suggest a recent increase in age at marriage. A fairly constant age at marriage for the older cohorts combined with a large recent increase has been observed elsewhere in Latin America, including Jamaica (Singh 1980), Dominican Republic (Guzmán 1980), Colombia (Flórez and Goldman 1980); as well as in Asia.

Further analysis of age of marriage by period and cohort provides indications of trends in age at marriage as well as evidence of the accuracy of date reporting in the union history. Table 9 presents proportions of women ever in a union for successive dates five years prior to the survey. Values for a given age group occupy the same row, whereas values for a given cohort can be read up a diagonal. We note a substantial decrease in the proportions of women ever married in the age groups 15–19 and 20–24. For example, the proportion in union at ages 15–19 declined by 50 per cent from 49.5 to 24.3 per cent over the last 15 years, and the proportion at ages 20–24 declined from 84.8 per cent to 73.6 per cent over the past decade. These decreases in proportions ever married are consistent with the increases in the estimated mean ages at marriage for the youngest cohorts shown previously in table 8. The impact of increases in age at marriage on fertility rates for the young ape groups will be discussed in section 4.

Except for some minor discrepancies in the more distant periods, the proportions ever married as from a given age are remarkably consistent for cohorts aged 35 years and over. On the other hand, the cohort aged 30–34 has a higher percentage of ever-married women as of ages 15–19 and 20–24 than do any of the other cohorts. The possibilities of displacement of date of first union (*away* from the survey date) or of age misstatement for this cohort will be noted again in subsequent sections.

It appears as if actual changes in nuptiality account for the decreases in proportions ever married among younger

Table 8 Mean Age at Marriage[a] for Women Married by Age 25 and Mean Age at Marriage and Mean Age at First Birth Derived from Fitted Coale Model Nuptiality Schedule (by Age at Survey)

Age at survey	Mean age at marriage (for marriages before age 25)	Mean age from fitted model schedule	
		Marriage	First birth
20–24	–	20.0	21.3
25–29	17.7	19.2	21.1
30–34	17.4	18.6	20.4
35–39	17.1	18.6	20.4
40–44	17.2	18.5	20.1
45–49	17.1	18.8	20.7

[a]Includes all types of unions.
Source: GFS 1975.

Table 9 Percentage of Women Ever in a Union by Five-Year Age Group and Five-Year Intervals prior to the Survey: Reconstructed from Date of First Union

Age at specified year	Years prior to survey						
	0	5	10	15	20	25	30
15–19	24.3	34.7	37.5	49.5	44.8	45.2	40.3
20–24	73.6	80.5	84.8	83.9	83.7	82.4	
25–29	92.8	96.4	93.7	93.9	91.6		
30–34	98.0	95.8	96.0	96.2			
35–39	96.6	97.9	97.7				
40–44	97.9	97.7					
45–49	98.0						

Source: GFS 1975.

Table 10 Mean Number of Unions by Age at Survey and by Type of First Union

Age at survey	All women	Type of first union		
		Marriage	Common law	Visiting
15–19	.33	1.03	1.40	1.61
20–24	1.16	1.06	1.71	2.06
25–29	1.63	1.13	2.00	2.45
30–34	1.69	1.20	2.27	2.59
35–39	1.80	1.26	2.51	2.86
40–44	1.85	1.21	2.37	2.94
45–49	1.89	1.29	2.53	2.84
Total	1.34	1.17	2.17	2.38

Source: GFS 1975.

cohorts. However, the lower proportions ever married for the oldest cohorts as of ages 15–19 and 20–24 appear to be due to slight reporting errors. For example, note that as of age 15–19, 40 per cent of the cohort aged 45–49 were married, as compared with 45 per cent of the cohorts aged 40–44 and 35–39 and 50 per cent of the cohort aged 30–34. The lower proportions ever married, most notable for the oldest cohort, are reflected in a slightly higher estimated mean age at marriage (table 8) for women aged 45–49 (18.8) than for the next three oldest cohorts (18.5, 18.6 and 18.6). Although it is plausible that age at marriage declined somewhat in the past, it seems more likely that the older women have either displaced the date of first union *towards* the survey date or have omitted early (consensual or visiting) unions from the nuptiality histories. (It is also possible that some form of age misstatement has produced the apparent errors.) An older reported age at first marriage among women aged 45–49 as compared with women aged 40–44 seems to have occurred in numerous WFS surveys (Chidambaram *et al* 1980).

In order to determine whether the older age at first marriage for women aged 45–49 results from omissions of first unions (and hence the recording of second unions as first unions), we have examined the mean number of unions by cohort (table 10). The data indicate a generally increasing number of unions with increasing age, with a possible slight omission of first visiting unions for women aged 45–49. However, omissions of early unions do not seem to have occurred frequently enough to produce significant distortions of the nuptiality data.

Estimates of mean age at first birth by cohort, as obtained from fitted model schedules, have been shown in table 8, alongside the estimates of mean age at first marriage. We note that the trend in age at first birth parallels the trend in age at first marriage and suggests consistent reporting of dates of first union and first birth.

As noted above with respect to age at marriage, the higher estimated age at first birth for women aged 45–49 suggest displacement of the date of first birth towards the survey date (or omission of first births) for these women.

3.3 TRENDS IN AGE AT MARRIAGE BY ETHNIC GROUP

Proportions ever married by successive dates five years prior to survey are shown in table 11 by ethnic group (Indians and non-Indians). Comparisons between the data sets reveal some striking differences in nuptiality patterns.

For the more remote past (25–30 years ago), approximately twice as many Indians had been in a first union by age 15–19 as non-Indians. Much higher proportions ever married among the Indians, for ages 15–19 and 20–24, persist until about a decade prior to the survey. Until fairly recently, early and universal marriage was socially desirable among the Indians and contributed to their exceptionally high level of fertility prior to the mid-1960s (see table 21).

However, there has been a dramatic decline in proportions ever married for the Indians, beginning about 15 years prior to survey. For example, the proportion of 15–19 year olds ever married declined by almost half in a decade, from 58 per cent 15 years prior to survey to 30 per cent five years prior to survey. On the contrary, there has been no decline over the past 10–15 years in proportions ever married among the non-Indians. In fact, the proportions ever married in the age group 15–19 five years before the survey (and in the age group 20–24 at survey date) are *lower* among the Indians than among the non-Indians. These different nuptiality patterns between the Indian and non-Indian populations are reflected in the mean age at marriage by cohort (for women married before age 25). Although for the cohort 45–49 the non-Indians have a mean age at marriage two years higher than the Indians, the ages at marriage are almost equal for the cohort 25–29. The very recent rise in age at marriage for the Indians is not completely reflected in these numbers, since the rise largely affects younger cohorts. However, the proportions ever married for the five-year period prior to survey implicit in table 11 imply a *higher* singulate mean age at marriage for the Indian population. The effects of a changing age at marriage on the fertility patterns of the Indian population are described in section 4.5.

Table 11 Percentage of Women Ever in a Union by Five-Year Age Group and Five-Year Intervals prior to the Survey, and Mean Age at Marriage (for Women Married by Age 25), by Ethnic Group

Age	Years prior to survey							Mean age at marriage (for marriages before age 25)
	0	5	10	15	20	25	30	
A Indians[a]								
15–19	[b]	30.3	40.8	57.7	52.3	56.9	56.7	–
20–24	71.6	83.3	88.6	89.6	91.3	90.0		–
25–29	92.6	96.7	96.2	95.0	95.6			17.5
30–34	98.0	97.2	97.3	98.3				16.9
35–39	97.9	98.6	98.9					16.7
40–44	98.6	98.9						16.3
45–49	98.9							16.1
B Non-Indians								
15–19	[b]	39.8	33.7	37.1	34.9	33.2	26.4	–
20–24	76.0	77.3	79.2	76.3	75.8	75.9		–
25–29	92.9	95.9	90.2	92.9	88.2			17.8
30–34	97.7	94.0	94.8	94.3				18.1
35–39	94.9	97.2	96.7					17.7
40–44	97.2	96.7						18.3
45–49	97.2							18.2

[a]Includes only East Indians.
[b]Values cannot be obtained since 15–19 year olds attending school were not eligible for interview.
Source: GFS 1975.

The validity of the above comparisons clearly depends upon the accuracy of reports of date of first union. There does appear to be a displacement of date of first union (or omission of early unions) for the non-Indian cohort aged 45–49 which results in too low proportions ever married as of young ages for this cohort. Since the prevalence of unstable first unions is high among the non-Indians, omission of these early unions could cause the distortion. In addition, too high percentages ever married at young ages for the cohort 30–34 occur among both the Indian and non-Indian populations. With the exception of these data, the values in table 11 appear to be internally consistent and imply a constant age at marriage for the past 30 years for the non-Indians; a constant age at marriage followed by a rapid rise, about 10 or 15 years ago, for the Indians; and, nearly universal (97 per cent) marriage by age 30–34 for women of all ethnic groups.

4 Fertility

The Guyana Fertility Survey included a complete pregnancy history for all women who were eligible for the detailed individual interview. Each respondent provided information in chronological order of all her pregnancies including the month and year that each pregnancy was terminated, the type of outcome (live birth, still birth or abortion) as well as the month and year of death for each non-surviving child. Date reporting for these events was reasonably good. As noted earlier, more than 90 per cent of the respondents were able to report the month and year of these vital events.

The data from the pregnancy history, if accurate, provide a valuable source for the estimation of fertility trends and patterns. However, information collected from retrospective fertility surveys has not always yielded reliable estimates because of various kinds of reporting errors, eg incorrect reporting of age, omission of births, and displacement of dates of birth of children. In the following sections, the data from the pregnancy history will be scrutinized for evidence of errors, by checks for internal consistency as well as comparisons with external sources of data. Guyana has a long history of decennial census enumerations as well as vital registration data, both dating back to the 19th century. Recent censuses have collected data on cumulative fertility (children ever born) and tabulations have been available by five-year age groups of women for a number of subgroups. Data on live births by age of mother are available from vital registration since the 1960s for the computation of age-specific fertility rates.

4.1 RECENT TRENDS AND CURRENT LEVELS OF FERTILITY

From the available evidence, it seems that Guyana has experienced a substantial decline in fertility since the 1960s. Table 12 presents age-specific fertility rates calculated from

Table 12 Age-Specific Fertility Rates and Total Fertility Rates by Calendar Year 1950–74

Year	Age-specific fertility rate							Total fertility rate[a]
	15–19	20–24	25–29	30–34	35–39	40–44	45–49	
1950	177	371						
1951	171	267						
1952	184	348						
1953	194	317						
1954	194	334						
1955	176	307	380					
1956	188	381	308					
1957	193	335	294					
1958	225	354	299					
1959	193	376	297	300				
1960	221	343	328	334				7.6
1961	199	366	325	286				7.4
1962	166	385	323	251				7.1
1963	128	374	317	265				6.9
1964	124	341	310	262	214			6.7
1965	129	358	319	226	182			6.6
1966	159	367	332	251	184			7.0
1967	124	352	303	241	162			6.4
1968	147	337	296	241	148	110		6.5
1969	130	259	296	206	123	64		5.4
1970	104	333	269	212	135	88		5.8
1971	126	299	255	214	135	61		5.5
1972	117	305	262	225	125	48		5.5
1973	87	250	244	167	105	48	7	4.5
1974	107	249	216	153	86	27	14	4.3

[a]In the computation of the Total Fertility Rate, the empty cells are estimated by the average of the last three rates which are available for the corresponding age group.
Source: GFS 1975.

the survey data for the years 1950–74. Since no women over age 49 are included in the individual survey, estimates for years in the past become progressively restricted to younger age groups. In the computation of rates for the cohort aged 15–19, the denominators were adjusted to include women who were full-time students and were therefore not eligible for interview. The adjustment was based on the assumption that the excluded women had no births. The data indicate that the Total Fertility Rate declined from 7.6 in 1960 to 4.3 in 1974 (a 43 per cent decline).

A rise in age at marriage, particularly among the Indians, is partly responsible for the decline, but a reduction in marital fertility is also clearly evident. This reduction has been achieved in the absence of any official or private contraceptive or birth control programme. It appears that rapid social change in the last two decades has prompted wider acceptance of birth control methods by cohabiting couples to limit the size of their families. According to the survey data, 57 per cent of the women ever in a union had ever used some method of contraception (44 per cent used an efficient method and 13 per cent used an inefficient method). At the time of the survey, 38 per cent of exposed women were classified as current users. Also, the high percentage of non-live births reported in the survey (178 per 1000 pregnancies) suggests that abortion might be an important method of birth control. Ever-use of contraception was especially high among women 25–34 years (67 per cent), highly educated women (63 per cent) and urban women (70 per cent). Non-Indians had a higher rate of ever-use of contraception (66 per cent) as compared with Indian women (50 per cent), but current use of contraception was surprisingly higher among Indians (40 per cent) than among non-Indians (36 per cent).

The fertility decline observed from the survey data has also been demonstrated by vital registration data. Vital statistics have been considered fairly reliable and complete in recent years in Guyana (except for the small Amerindian population living in the remote areas of the country), although no thorough evaluation has yet been undertaken. According to the data on registered births, the crude birth rate declined by 33 per cent between 1960 and 1974, from 41.6 to 28.0 per 1000 live births. Table 13 shows age-specific fertility rates from vital registration for the 1960–74 period. These data indicate that the Total Fertility Rate had declined during the 15 year interval by 37 per cent (compared with 43 per cent according to survey estimates) from 6.2 to 3.8 children per woman. Table 14 shows age-specific fertility rates for the periods 1960–4 and 1970–4 according to both vital registration data and the GFS. Again, although the percentage declines in the Total Fertility Rates from the two sources are close, the rates derived from the pregnancy histories are consistently higher than those derived from vital statistics. The Total Fertility Rates calculated from the vital registration data are 10–20 per cent lower than the survey rates and cast some doubt on the completeness of the vital registration data. Although we cannot be certain that the survey estimates are not also affected by omissions, it seems unlikely that the higher estimates from the GFS result from an over-reporting of live births.

Figure 2 shows the Total Fertility Rates from vital registration and from the GFS for the years 1960–74. As noted above, despite the differences in the level of fertility, the trends are quite similar. The higher survey estimates for 1965–70 could result from forward displacement of births from the more distant past or from real variations in fertility, since both data sources show peaks in 1970 and deficits in 1969 and 1971. The period 1965–70 contained several important political changes; independence in 1966, national elections in 1968, and formation of a Co-operative Republic in 1970. These events may have influenced the dating of births by producing a transfer or heaping of dates of birth to the corresponding years.

Figure 2 indicates that the difference in the level of fertility, as derived from vital registration data and the GFS, is smaller in recent years. The change may be due to improved collection of vital registration data. Less than 50 per cent of the registered births occur in hospitals for which hospital authorities are under legal obligation to report; for births occurring outside these institutions

Table 13 Age-Specific Fertility Rates for Select Calendar Years from 1960–74 derived from Vital Registration, Guyana

Year	Age-specific fertility rate							Total fertility rate
	15–19	20–24	25–29	30–34	35–39	40–44	45–49	
1960	154	337	309	240	152	46	7	6.2
1963	123	338	291	250	153	52	7	6.1
1964	118	330	287	248	152	53	6	6.0
1965	118	310	294	247	151	48	7	5.9
1966	115	287	277	231	147	50	7	5.6
1967	125	267	274	218	133	45	6	5.3
1968	117	271	278	205	129	44	7	5.3
1969	108	296	252	180	121	33	5	4.8
1970	109	283	253	191	125	46	6	5.1
1971	109	269	232	174	118	40	7	4.8
1972	112	272	221	180	116	42	4	4.7
1973	104	250	198	168	100	39	4	4.3
1974	99	225	189	137	83	31	4	3.8

Sources: 1960–71: Singh 1979, p 317; 1972–74: Unpublished data from the Guyana Ministry of Economic Development.

Table 14 Age-Specific Fertility Rates for 1960–64 and 1970–74 and Percentage Decline in the Rates according to Vital Registration and the GFS

Age group	Fertility rates				Percentage decline	
	1960–64		1970–74		1960–64 to 1970–74	
	Vital registration	GFS	Vital registration	GFS	Vital registration	GFS
15–19	132	168	107	108	18.9	35.7
20–24	335	362	260	287	22.4	20.7
25–29	296	321	219	249	26.0	22.4
30–34	246	280	170	194	30.9	30.7
35–39	152	–	108	117	28.6	–
40–44	50	–	40	54	20.0	–
45–49	7	–	5	10	28.6	–
TFR	6.1	7.1	4.5	5.1	26.2	28.7

Source: Table 13.

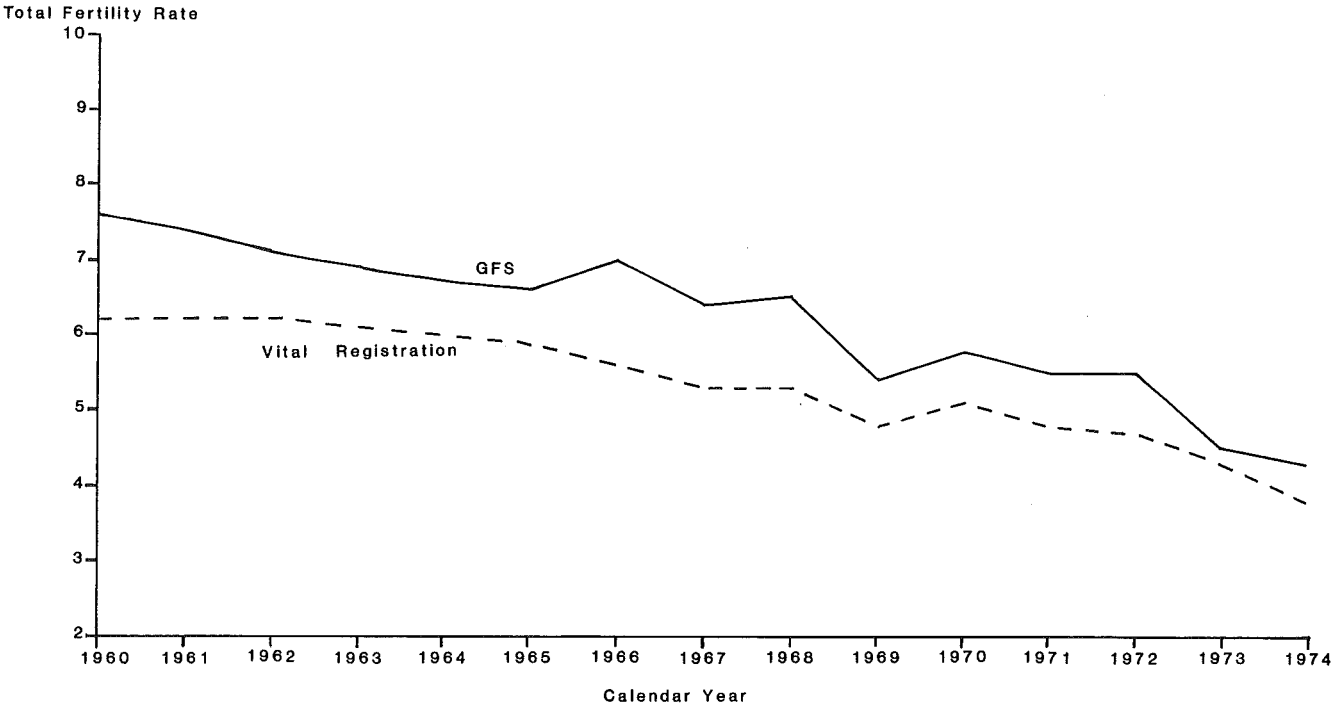

Figure 2 Total Fertility Rates by Calendar Year, 1975 GFS and Vital Registration

(eg at home) the primary informant is either the midwife or the parent. In recent years, perhaps through increasing education and higher levels of literacy, better organizational and administrative arrangements and perceived advantages to the individual to be legally registered, there may have been an improvement in the completeness of registration.

Note that the vital registration data and the GFS data show generally similar age patterns of fertility for ages above 15–19 (table 14). For example, if the age *patterns* of fertility as derived from the GFS are correct for the periods 1960–64 and 1970–74, then the vital registration data suffer from under-reporting of births for 15–19 year olds in 1960–4 and over-reporting of births for 15–19 year olds in 1970–4 (relative to the completeness of reporting in the other age groups). The relatively higher estimate derived from the GFS for 15–19 year olds for 1960–4 is consistent with the higher percentages reported as ever married for the cohort aged 30–34 at survey date. Further evidence of higher reported fertility for this cohort will be presented in sections 4.2 and 4.3.

In table 15, marital fertility rates (based on births occurring and person-years lived *since* first union, regardless of dissolution) by duration since first marriage are presented for the three most recent five-year periods. With the exception of duration 0–4, the rates show a substantial

Table 15 Duration-Specific Marital[a] Fertility Rates for Three Most Recent Five-Year Periods prior to Survey

Duration at end of period	Years prior to survey		
	0–4	5–9	10–14
0–4	181	164	164
5–9	345	370	402
10–14	243	307	347
15–19	174	239	295[b]
20–24	120	173[b]	227[b]
Duration specific fertility rate cumulated to 25 years of marriage duration	5.3	6.3	7.2

[a]Based on all ever-married women.
[b]These values are probably overestimates because they are derived from women who were necessarily married at young ages (see below p 24).
Source: GFS 1975.

decline in marital fertility, most notable at the high durations. The slight increase in rates for 0–4 duration is probably the result of an increase in age at marriage. Cumulating the rates up to 25 years of marriage, we note a decline in the Total Marital Fertility Rate from 7.2 to 5.3 (26 per cent) over approximately a decade. Comparable estimates of marital fertility are not available from vital statistics, but estimates for the years 1960 and 1970 suggest a 21 per cent decline in the Total Marital Fertility Rate (Singh 1979).

The analysis so far has demonstrated a recent decline in fertility as a result of both increases in age at marriage and reductions in marital fertility. The trend in fertility is fairly consistent between the survey data and vital registration data, which provides a strong basis for confidence in the survey estimates. We do note differences between these sources in the level of fertility, although the difference diminishes in recent periods. As will be observed in the next section, the reconstructed estimates of cumulative fertility agree quite closely with the corresponding estimates from the censuses and provide further evidence that the discrepancies between the survey and vital registration data arise mainly because of under-registration of births.

4.2 COMPARISON OF CUMULATIVE FERTILITY WITH THE 1960 AND 1970 CENSUSES

Both the 1960 and 1970 censuses collected data on numbers of children ever born for women aged 15 years and over. From the survey data, cumulative fertility by age group can be reconstructed as of the census dates. Table 16 shows cumulative fertility reconstructed from the survey data and as reported in the censuses. For most age groups, there is close correspondence between the retrospective estimates and those obtained independently from the census enumerations. Note that for women aged 15–19 in 1960, the survey estimates are higher than the census estimates. As we have noted several times previously, the cohort aged 30–34 at survey date appears to have 'too high' levels of fertility (and proportions ever married) at dates in the past.

In general, the comparison in table 16 reveals consistent reporting of lifetime fertility from two independent data sources, and suggests complete reporting of births in the GFS. This agreement in reported parity for most cohorts (and for all of the older cohorts) implies that the discrepancies in level of fertility shown in figure 2 are mostly due to deficiencies in the vital registration data.

4.3 EXAMINATION OF COHORT-PERIOD FERTILITY RATES

A more detailed examination of the birth history data can be undertaken by calculation of fertility rates by cohort and period (see Verma 1980: 11–19, 47–48). For this purpose we define cohorts in terms of five-year age groups of the time of the survey and divide them into five-year periods before the date of the survey. For conciseness we refer to the cohort aged 25–29 at the time of the survey as 'the cohort 25–29'. The rates are obtained by a straightforward tabulation of births by period of occurrence and age of mother at survey. Note that these measures are different from conventional age-specific fertility rates. For example births to the cohort 25–29 in the period 0–4 years before the survey have occurred to women aged 20–29 at the time of birth of the child, a span of ten rather than five years. This rate is directly comparable, however, with the rate for the cohort 30–34 in the period 5–9 years before the survey, when this cohort was also moving through ages 20–29. For ease of reference these rates are said to be *centred* on age 25.

Panel A of table 17 shows cohort-period fertility rates for all women. To facilitate comparison of rates at equivalent ages the data have been aligned according to the age of the cohort at the end of each time-period. Thus, rates centred on the same age are found along a row of the table whereas rates for a given cohort are found up a diagonal. For example the rate centred on age 25 was 268 in the five years preceding the survey and 347 in the period 5–9 years before the survey, these rates corresponding to the cohorts aged 25–29 and 30–34 at survey, respectively.

Table 16 Mean Numbers of Children Ever Born by Age Group as of the 1960 and 1970 Census Dates Reconstructed from the Fertility History in the GFS (1975) and as Reported in the Censuses

Age at census date	1960		1970	
	GFS	Census	GFS	Census
15–19	.45	.31	.21	.19
20–24	1.86	1.77	1.45	1.43
25–29	3.38	3.36	3.70	3.43
30–34	4.51	4.53	4.88	4.90
35–39	–	–	5.85	5.95
40–44	–	–	6.27	6.18

Sources: Central Statistical Office 1967; vol III, part C, table 3; Census Research Programme 1976, vol 8, table 1; GFS 1975.

Table 17 Cohort-Period Fertility Rates and Cumulative Rates for Cohorts and Periods (for Five-Year Birth Cohorts and Five-Year Periods before the Survey)

Age of cohort at end of period	Central age	Years prior to survey						
		0–4	5–9	10–14	15–19	20–24	25–29	30–34
A Cohort-Period Rates (per 1000 women)								
15–19	15	38	43	47	85	77	73	53
20–24	20	216	235	304	294	272	251	
25–29	25	268	347	344	333	313		
30–34	30	218	263	305	290			
35–39	35	148	193	233				
40–44	40	81	114					
45–49	45	23						
B Cumulative Cohort Rates (P_i)								
15–19	15	.19	.22	.24	.43	.40	.37	.27
20–24	20	1.30	1.42	1.95	1.87	1.73	1.52	
25–29	25	2.76	3.69	3.59	3.40	3.09		
30–34	30	4.78	4.91	4.92	4.52			
35–39	35	5.65	5.89	5.70				
40–44	40	6.23	6.27					
45–49	45	6.39						
C Cumulative Period Rates (F_i)								
15–19	15	.19	.22	.24	.43	.39	.38	.27
20–24	20	1.27	1.39	1.76	1.90	1.76	1.63	
25–29	25	2.61	3.13	3.48	3.56	3.32		
30–34	30	3.71	4.44	5.01	5.01			
35–39	35	4.45	5.41	6.17				
40–44	40	4.85	5.98					
45–49	45	4.97						

Source: GFS 1975.

Panel B of the table shows cohort-period rates cumulated over time for each cohort. These values correspond to the mean parity that each cohort had achieved at the end of each period and are denoted P_i. For example the cohort 25–29 had a mean parity of 2.76 children at the time of the survey, compared with a mean parity of 3.69 for the cohort 30–34 five years earlier, when it was also 25–29.

Panel C of the table shows cohort-period rates cumulated over cohorts for each time period. These values correspond to the cumulative fertility that a synthetic cohort would achieve by each age group if the period rates prevailed, and are denoted F_i. For example in the five years preceding the survey cumulative fertility up to age 40–44 was 4.85 children, compared with 5.98 children up to the same age in the period 5–9 years before the survey.

The fertility rates in panel A of the table suggest that fertility has declined since about 10–14 years prior to the survey. For example, between 10–14 years and 0–4 years prior to the survey, the rates centred on ages 15, 20, 25, 30 and 35 declined by 19 per cent, 29 per cent, 22 per cent, 29 per cent, and 36 per cent respectively. The declines have occurred in all age groups.

However, it is important to note that, for most age groups, the period rates for 10–14 years ago are higher than rates in the neighbouring periods. A similar phenomenon has been observed in fertility schedules in a number of WFS surveys in Asia and Latin America (eg Pakistan, Bangladesh, Jordan, Dominican Republic): dates of births have been concentrated in the period 5–14 years before the survey at the expense of the earlier periods (Chidambaram *et al* 1980). Potter (1977) has demonstrated that, under certain conditions, a displacement of births in the remote past can lead to an over-reporting of births in periods approximately 5–14 years prior to the survey. Displacement of births in the remote past by the oldest cohorts is also evident from the data in table 17. From panel B we note that the cohort 45–49 has lower fertility at young ages than the cohorts 30–34, 35–39 and 40–44. For example mean parity by age 25–29 was 3.09 children for the cohort 45–49 as compared with 3.69, 3.59, and 3.40 children for the cohorts 30–34, 35–39 and 40–44 respectively. Displacement also seems to have affected the next oldest cohort (40–44), which has lower fertility at the young ages than the cohort 35–39. These 'older' patterns of fertility for the cohorts 40–44 and 45–49 can also be seen from the cohort fertility rates graphed in figure 3.

We also note from panel A in Table 17 that the fertility rates for the cohort 30–34 are 'too high' at the young ages. For example, the rate centred on age 15 is 85 births per 1000 women for the cohort 30–34, compared with 47 and 77 for the neighbouring cohorts (25–29 and 35–39, respectively). The rates centred on ages 20 and 25 are also higher for the cohort 30–34 than for the neighbouring

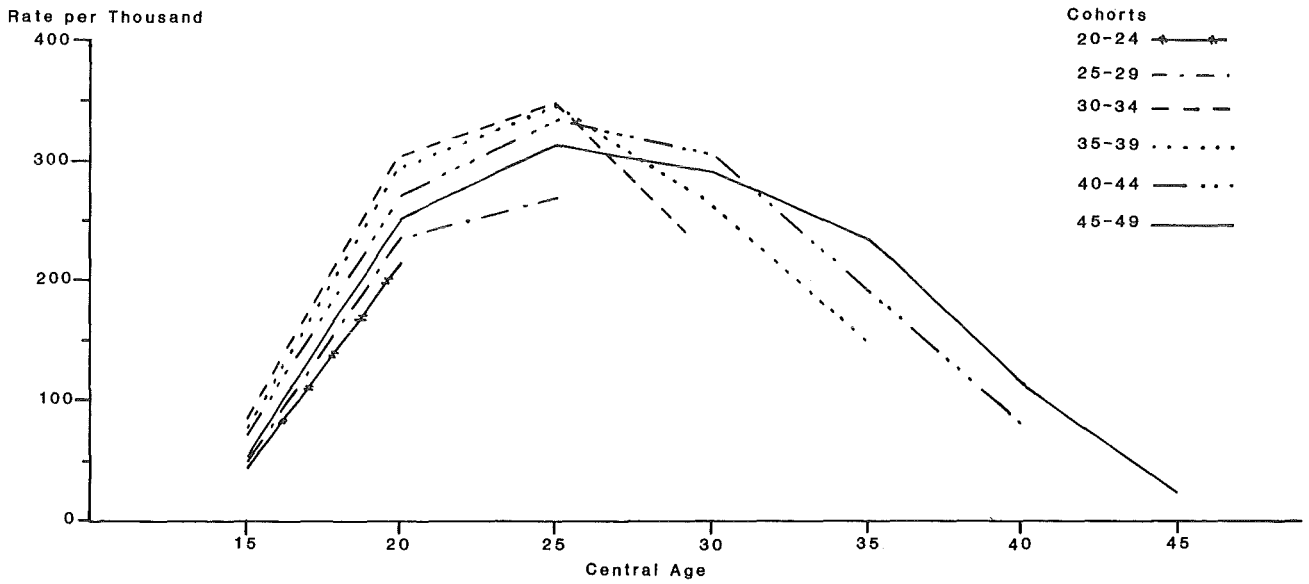

Figure 3 Cohort-Period Fertility Rates (per 1000 Women) for Five-Year Birth Cohorts by Age, 1975 GFS

cohorts. Although it has been previously suggested that the high fertility and early marriage for this cohort could be due to displacement errors in the dating of events or to age reporting errors, in light of the present evidence, the latter error appears more likely. If displacement errors were responsible for the apparent anomalies, the direction of the displacement would have to be *away* from the survey date in order to produce high fertility at the young ages. This would be in the direction opposite to the displacement evident for the oldest two cohorts. In addition, we would then expect to find a deficit of births at later ages for the cohort 30–34: although the rate in the past five years (218) might be somewhat low, the rates at all other ages appear to be uncharacteristically high.

It seems more likely that age misstatement has resulted in too high fertility rates for this cohort. For example, if women in the cohort 35–39 had been reported as 30–34, women reported as 30–34 would, on average, have too high fertility rates. This would be especially true of their fertility at the youngest ages (eg when some women would be 20–24 rather than 15–19). A similar pattern of age misreporting (but for the cohort 35–39) has been detected in the Dominican Republic National Fertility Survey (Guzmán 1980).

We previously noted a rapid fertility decline since the period 10–14 years prior to the survey (approximately 1960–5) and the possibility that the decline may have been overestimated because of errors in the survey data. For example, the rates centred on ages 20, 25 and 30 for the period 10–14 years ago are several per cent higher than the rates in the period 15–19 years ago. However, these differences are quite small. We noted on p 20 that the decline in fertility from 1960 to 1974 was 37 per cent as obtained from vital registration data and 43 per cent as obtained from survey data. Part of this discrepancy may be due to displacement errors in the GFS.

The P/F ratio procedure, originally devised by Brass as a technique for indirect estimation of current fertility, has been applied to a number of recent WFS surveys to evaluate the birth history data (Brass 1978; Booth 1979; Goldman and Chidambaram 1980; Guzmán 1980). Deviations in P/F ratios from unity provide evidence of displacement, reference period error or omissions, or may indicate a violation of the assumption of constant fertility. According to table 18, P/F ratios for birth cohorts for the periods 0–4 years and 5–9 years before the survey are greater than 1.00. For the most recent period the ratios increase with increasing age. These high ratios reflect a recent and substantial decline in fertility, but supply no useful information on reference period error. However, the low values of the ratios for the oldest cohorts in the earliest periods and the especially high values for the cohort 30–34 do point out the reporting errors noted earlier.

The P/F ratios by birth cohort have not provided evidence of reference period error in the most recent periods because of a decline in fertility resulting from changing age at marriage. An alternative procedure for assessing data quality uses P/F ratios by *marriage cohort* (Goldman and Chidambaram 1980). Tests on several WFS surveys (eg Bangladesh and Pakistan) have shown that P/F ratios by marital duration may provide more reliable information on omissions and displacement of births than P/F ratios by age, particularly if age at first union has been changing much more rapidly than marital fertility. Since women married for long durations were necessarily married at young ages (ie no one in the GFS sample is over age 50), application of the procedure requires a control on age at marriage, as described in Goldman and Chidambaram (1980). The results of applying this technique are shown in the second panel of table 18.

The P/F ratios for marriage cohorts are consistently greater than 1.00 for the higher durations in the most recent periods. These ratios are also larger than unity in the period 5–9 years before the survey. The behaviour of the ratios is consistent with a large decline in marital fertility at the higher durations of marriage (union). The ratios for the earliest periods for the higher duration cohorts are below unity and decrease with higher durations. Again, these values suggest slight omission or displacement errors for the oldest cohorts. The P/F values at the lower marriage

Table 18 P/F Ratios for Birth and Marriage Cohorts for Five-Year Periods prior to the Survey

Age or duration category	Years prior to survey						
	0–4	5–9	10–14	15–19	20–24	25–29	30–34
A Ratios for birth cohorts							
Age of cohort at end of period							
15–19	1.01	1.01	1.00	1.01	1.01	0.99	0.99
20–24	1.02	1.02	1.11	0.99	0.99	0.93	
25–29	1.06	1.18	1.03	0.95	0.93		
30–34	1.29	1.10	0.98	0.91			
35–39	1.27	1.09	0.92				
40–44	1.30	1.05					
45–49	1.29						
B Ratios for marriage cohorts[a]							
Marital duration at end of period[b]							
0–4[c]	1.02	1.02	1.00	1.03	0.99	0.98	0.93
5–9	0.97	1.00	1.06	0.98	0.97	0.92	
10–14	1.02	1.08	1.01	0.93	0.93		
15–19	1.14	1.08	0.98	0.91			
20–24	1.20	1.05	0.92				
25–29	1.22	1.04					
30–34	1.18						

[a]For all women ever in a union: P/F values are modified for truncation bias according to the procedure discussed in Goldman and Chidambaram (1980).
[b]Interval since first union.
[c]Values greater than 1.00 are due to premarital births.
Source: GFS 1975.

durations for the most recent period are very close to 1.00 (0.97 for 5–9 years since first marriage and 1.02 for 10–14 years since first marriage). These values suggest that births were accurately dated in the most recent period. That is, the level of fertility as reported for the five years prior to the survey appears to be approximately correct.

In summary, the P/F ratios point to slight reporting errors by the oldest cohort in the earlier periods and 'excess' fertility for the cohort 30–34. However, with these exceptions, the fertility data appear to be internally consistent. The data indicate a TFR of 5.0 for the five years prior to the survey and large changes in both age at marriage and marital fertility over the past decade.

4.4 COHORT-PERIOD FERTILITY RATES BY BIRTH ORDER

Researchers have shown that data on first births can sometimes yield useful information on reporting errors in the birth histories. For example, the proportion of women who eventually become mothers is not likely to change much over time, even if overall fertility rates are declining.

Table 19 shows cohort-period fertility rates for first births, as well as cumulative rates for cohorts. As expected, the data indicate a probable displacement of date of first birth toward the survey date for the oldest cohort and a slightly too high first birth rate for the cohort 30–34. The data indicate generally constant first birth rates for most age groups, except in the most recent period. The slight decreases in the rates centred on ages 15 and 20 and the increase at age 25 are most likely due to rising age at marriage. The cumulative rates by cohort indicate that approximately 94 per cent of women eventually become mothers. This estimate is constant across the oldest cohorts and agrees with estimates from the 1970 census.

Table 19 also shows cohort-period fertility rates for births of order four or higher. The low rates in the distant past for the oldest cohorts and the very high rate for the cohort aged 30–34 in the period 10–14 years ago are notable. These data also indicate a very large recent decline in fertility for births of high parity.

In summary, the data on fertility by birth order confirm the reporting errors noted earlier but suggest overall consistency of the fertility information from the maternity histories.

4.5 FERTILITY RATES BY ETHNIC GROUP

A significant factor in the study of fertility levels in Guyana has been the marked differences between those of the Indians and the non-Indians (mainly Africans). The Indians traditionally have demonstrated a high level of fertility which has been partly attributed to a low age at marriage, a stable mating system, and a low incidence of childless-

Table 19 Cohort-Period Fertility Rates for First Births and Births of Order Four or Higher (per 1000 Women) and Cumulative Cohort Rates for Five-Year Periods prior to Survey

Age of cohort at end of period	Years prior to survey						
	0–4	5–9	10–14	15–19	20–24	25–29	30–34
A First birth rates							
15–19	28	31	34	51	49	50	38
20–24	83	88	92	90	85	98	
25–29	45	34	33	33	33		
30–34	10	10	10	11			
35–39	3	1	7				
40–44	1	0					
45–49	0						
B Cumulative proportions of mothers at end of period (P)							
15–19	.14	.16	.17	.26	.26	.26	.20
20–24	.57	.61	.72	.71	.68	.69	
25–29	.84	.89	.87	.85	.85		
30–34	.94	.92	.90	.91			
35–39	.94	.90	.94				
40–44	.91	.94					
45–49	.94						
C Birth rates for orders four or higher							
20–24	27	29	66	55	44	32	
25–29	109	194	190	191	154		
30–34	164	212	254	226			
35–39	131	179	204				
40–44	76	111					
45–49	21						

Source: GFS 1975.

ness. Estimates for 1951 indicate a Gross Reproductive Rate of 3.6 for Indians and 2.6 for the non-Indians (Roberts 1956). It has been suggested by Caribbean demographers that the patterns of marital instability and casual mating are among the factors that have tended to depress the fertility of the non-Indian population (Marino 1970). Unfavourable sex ratios, high levels of childlessness and relatively higher levels of education and urbanization among the non-Indians may have also contributed to a lower level of achieved fertility.

Trends in Fertility

Table 20 shows numbers of children ever born for Indians and non-Indians as derived from the GFS (1975). For the older cohorts, cumulative fertility is higher among the Indians by over one child. However, in section 3.3, we noted a recent rapid rise in age at marriage for the Indian population, a change we expect to affect the fertility rates of the younger cohorts.

Table 21 presents cohort-period fertility rates for Indians and non-Indians by birth cohort for five-year periods prior to the survey. If reporting errors are absent, the rates indicate a substantial decline in Indian fertility at all ages, since the period 10–14 years prior to the survey. For example, between 10–14 and 0–4 years prior to the survey, the fertility rate centred on age 35 declined by almost 50 per cent from 233 to 122 per 1000, while the rate centred on age 30 declined by 40 per cent. The decline at the younger ages is largely due to the increase in age at marriage noted earlier. The declines in fertility for the non-Indian population are much more modest, eg 22 per cent and 11 per cent for the rates centred on ages 35 and 30, respectively, between 10–14 and 0–4 years prior to the survey.

Appendix tables A1 and A2 at the end of this Report

Table 20 Reported Numbers of Children Ever Born to All Women and to Indians and Non-Indians by Five-Year Age Group

Age at survey	All women	Indians[a]	Non-Indians
15–19	0.20[b]	–	–
20–24	1.31	1.43	1.16
25–29	2.76	2.97	2.53
30–34	4.79	5.15	4.25
35–39	5.65	5.80	5.46
40–44	6.29	6.85	5.71
45–49	6.40	7.19	5.72

[a]Includes only East Indians.
[b]Adjusted for women 15–19 years attending school.
Source: GFS 1975

Table 21 Cohort-Period Fertility Rates (per 1000 Women) for Five-Year Periods prior to Survey: Indians and Non-Indians

Age of cohort at end of period	Years prior to survey						
	0–4	5–9	10–14	15–19	20–24	25–29	30–34
A Indians[a]							
15–19	31[b]	45	56	97	85	91	74
20–24	238	270	370	329	330	317	
25–29	265	365	374	365	367		
30–34	196	264	324	313			
35–39	122	191	233				
40–44	67	109					
45–49	18						
B Non-Indians							
15–19	48[b]	40	37	67	67	55	34
20–24	191	195	205	247	212	194	
25–29	272	318	304	300	268		
30–34	251	286	285	270			
35–39	182	194	232				
40–44	95	119					
45–49	27						

[a]Includes only East Indians.
[b]Based on the assumption that the proportion of 15–19 year olds attending full-time school is the same for Indians and non-Indians.
Source: GFS 1975.

present cumulative fertility rates by cohort and period, and P/F ratios, for Indians and non-Indians. The very high P/F ratios for Indians for the most recent period highlight the very large decline in fertility. For the period 0–4 years prior to the survey, the data indicate a Total Fertility Rate of 4.7 for Indians, which is less than the estimated value of 5.3 for non-Indians. Only 10 years prior to this, cumulative fertility up to age 35–39 equalled 6.8 for Indians, a value almost 30 per cent higher than the corresponding estimate of 5.3 for non-Indians.

We have already noted that part of the large recent fertility decline for Indians is a result of decreasing proportions ever married as of the young ages (table 11). However, much of the change is due also to declining marital fertility. Table 22 shows cohort-period marital fertility rates for cohorts of ever-married women for the three most recent five-year periods, for Indians and non-Indians. With the exception of rates in duration 0–4, which increase as a result of a rising age at marriage, the rates show a substantial decline in all durations for the Indian population. For the higher durations of marriage (15–19 and 20–24) the rates decline significantly for the non-Indian population as well. However, from the period 10–14 years prior to the survey to the most recent period, the reported decline in marital fertility is about twice as great for the Indians as for the non-Indians.

In summary, the data in the maternity histories suggest a very large decline in fertility over the past decade for the Indian population. The decline results from both rapid increases in age at marriage and declines in marital fertility. On the other hand, the non-Indian population shows a much more modest decline in fertility, a decline which appears to be due almost entirely to reductions in marital fertility at the higher durations.

Table 22 Cohort-Period Marital Fertility Rates for the Three Most Recent Five-Year Periods prior to Survey: Indians and Non-Indians[a]

Marital duration of cohort at end of period	Years prior to survey		
	0–4	5–9	10–14
A Indians			
0–4	212	187	186
5–9	367	398	450
10–14	229	330	376
15–19	162	240	304[b]
20–24	112	170[b]	221[b]
Marital fertility rate cumulated to 25 years of marriage duration	5.4	6.6	7.7
B Non-Indians			
0–4	144	136	141
5–9	322	344	332
10–14	266	272	312
15–19	189	235	285[b]
20–24	128	183[b]	214[b]
Marital fertility rate cumulated to 25 years of marriage duration	5.2	5.9	6.4

[a]Based on all women ever in a union; Indians include only East Indians.
[b]These values are probably overestimates because they are derived from women who necessarily entered their first union at young ages (see page 24).
Source: GFS 1975.

Evidence of Reporting Errors

Examination of the fertility schedules in table 21 indicates reporting errors on the part of the oldest cohorts. For both Indians and non-Indians, the cohort 45–49 (and possibly the cohort 40–44) have either omitted or displaced early births, errors which have resulted in too low fertility rates at the young ages.

We also note that the high fertility of the cohort 30–34 occurs basically among the Indian population. In particular the rates for this cohort in the periods 10–14 and 15–19 years prior to the survey (370 and 97 respectively) are considerably larger than neighbouring rates.

The ostensible heaping or displacement of births to the period 10–14 years prior to the survey is also more notable for the Indians, ie the fertility rates centred on ages 20, 25 and 30 in the period 10–14 years prior to the survey are larger than the corresponding rates in the neighbouring periods for the Indian population. These data suggest that the fertility decline in the last decade as reported for Indians may be slightly overestimated. Nevertheless, consistency of the rates for most of the older cohorts and the generally smooth trends suggest that the decline is real and large.

4.6 FERTILITY ACCORDING TO EDUCATIONAL ATTAINMENT AND AREA OF RESIDENCE

Trends and Differentials in Fertility

Table 23 shows cohort-period fertility rates for women with successive levels of education. We observe the expected differential, ie decreasing fertility with increasing levels of education. These data confirm the recent decline in fertility (since the period 10–14 years prior to the survey). Note, however, that the decline is largest (and affects all ages) for women with less than four years of primary education. The explanation for the surprising finding is that these women are predominantly of East Indian origin. For women with more education, the decline has mostly affected women over age 25. The cumulative period rates (F) up to age 30–34 given in table 24 for the twenty years prior to survey show the different magnitudes of the fertility decline. These data suggest that trends in age of marriage and in marital fertility have differed by level of education.

Table 25 shows cohort-period fertility rates by urban and rural area of residence. Fertility has declined more dramatically in the rural than in urban areas but current levels of fertility reveal only small differences between

Table 23 Cohort-Period Fertility Rates per 1000 Women by Level of Education

Age of cohort at end of period	Years prior to survey						
	0–4	5–9	10–14	15–19	20–24	25–29	30–34
A Less than four years primary education							
15–19	[a]	109	144	136	108	96	88
20–24	322	345	404	354	299	320	
25–29	307	389	346	352	333		
30–34	248	269	337	282			
35–39	163	198	240				
40–44	78	105					
45–49	17						
B At least four years primary education							
15–19	[a]	82	59	82	73	74	40
20–24	301	277	299	297	293	238	
25–29	273	350	359	351	317		
30–34	223	267	313	313			
35–39	147	200	233				
40–44	89	119					
45–49	26						
C Secondary or higher education							
15–19	[a]	29	15	32	39	19	16
20–24	189	152	195	168	115	105	
25–29	252	276	265	204	226		
30–34	161	232	196	174			
35–39	122	144	205				
40–44	48	116					
45–49	21						

[a]Values cannot be obtained since 15–19 year olds attending school were not eligible for interview.
Source: GFS 1975.

Table 24 Cumulative-Period Fertility Rate up to Ages 30–34 by Level of Education and by Area of Residence

Subgroup	Years prior to survey			
	0–4[a]	5–9	10–14	15–19
Level of education				
Less than 4 years' primary education	4.84	5.56	6.16	5.62
At least 4 years' primary education	4.31	4.88	5.15	5.22
Secondary or higher education	3.17	3.45	3.36	2.89
Area of residence				
Urban	3.40	3.68	4.00	4.06
Rural	3.89	4.85	5.53	5.54

[a]Rates for 15–19 year olds included in the calculation are based on the very crude assumption that the proportion of 15–19 year olds attending full-time school is identical for all subgroups.
Source: GFS 1975.

these areas. The Total Fertility Rate for the three years preceding the survey is 4.2 in the urban area compared with 4.7 in the rural area (not shown). The cumulative period rates (F) up to age 30–34 show a 30 per cent decline in rural areas, almost twice as large as the 16 per cent decline in urban areas, from the period 15–19 to 0–4 years prior to the survey (see table 24). The fact that Indians, whose fertility has also declined quite markedly, predominate in the rural areas (83 per cent of Indian women ever in a union were living in the rural areas at the time of the survey compared with 42 per cent of non-Indian women) provides no reason to disbelieve the trend or magnitude of the fertility decline observed in the rural areas.

Evidence of Reporting Errors

The fertility schedules in tables 23 and 25 suggest that the apparent omission or displacement of early births, on the part of the oldest cohorts, occurs among women of all levels of education and in both urban and rural areas. However, the 'excess' fertility of the cohort aged 30–34 is most marked among women with less than four years primary education and among women living in rural areas. That is, the hypothesized age misstatement of older women to the age group 30–34 appears to occur mostly among the less educated women.

The cumulative period fertility rates shown in table 24 suggest a large heaping of births in the period 10–14 years prior to the survey for women with less than four years of primary education. For these women, the rates in the period 10–14 years prior to the survey are higher than the corresponding rates in all other periods, for all cohorts except 35–39. Although displacement of early births could have produced some excess fertility in this period for the remaining subgroups of women, the displacement does not appear to have been large enough to reverse the basically monotonic decline in fertility for these subgroups.

4.7 TESTS FOR OMISSIONS OF LIVE BIRTHS

The investigation so far suggests that the retrospective fertility information has been fairly accurately reported. However, there have been indications that respondents have

Table 25 Cohort-Period Fertility Rates per 1000 Women by Area of Residence

Age of cohort at end of period	Years prior to survey						
	0–4	5–9	10–14	15–19	20–24	25–29	30–34
A Urban areas							
15–19	[a]	32	36	57	53	39	44
20–24	180	182	224	225	214	206	
25–29	238	285	302	282	256		
30–34	218	236	237	245			
35–39	126	170	214				
40–44	67	97					
45–49	23						
B Rural areas							
15–19	[a]	49	53	98	90	91	58
20–24	237	266	343	331	304	277	
25–29	286	377	367	361	348		
30–34	219	277	342	317			
35–39	160	205	244				
40–44	88	125					
45–49	23						

[a]Values cannot be obtained since 15–19 year olds attending school were not eligible for interview.
Source: GFS 1975.

misplaced the dates of births of their children closer to the survey date, which has resulted in artificial rises in fertility in the past. It is also possible that respondents have omitted some of their early births, ie those occurring to the older cohorts in the more distant periods from the survey. Either displacement or omissions of births (or age misreporting) could explain the discrepancies observed in the cohort fertility schedules.

Certain events may have had a higher probability of being omitted from the pregnancy histories than others. For example, female births and children who died in the first few years of life may have been selectively omitted. Evidence of differential omissions of live births may be found by an examination of the sex ratios at birth and the trend in infant and childhood mortality for periods in the past.

Sex Ratios at Birth

Table 26 shows sex ratios at birth for five-year periods prior to the survey. The numbers of female births on which these ratios are based are also presented so that sampling errors can be considered when comparing the ratios. Vital statistics for 1970–3 show that the overall ratio of 1.06 male births per female birth is consistent with registered births, which indicate a sex ratio varying from 1.03 to 1.06.

The sex ratios across periods tend to fluctuate, but this does not provide evidence of omission because of the very high sampling errors associated with estimated sex ratios. Note, however, that the sex ratios in the periods more than 20 years prior to the survey are considerably higher than the ratios 10 to 20 years prior to the survey. This may be due to some omission or displacement of female births in the remote periods. For example, if female births have been displaced from more than 20 years prior to the survey to the period 10–20 years prior to the survey, the sex ratios would be too high and too low in the two periods respectively, as shown in table 26. However, in general, the behaviour of the sex ratios at birth does not provide firm evidence of differential reporting errors according to sex of child.

Table 26 Sex Ratio at Birth (Males per Female Birth) for Five-Year Periods prior to Survey

Years prior to survey	Number of female births	Sex ratio
0–4	1720	1.06
5–9	1613	1.09
10–14	1489	1.02
15–19	1160	0.95
20–24	660	1.12
25+	334	1.28
Total	6987	1.06

Source: GFS 1975.

Proportions Dead of Children Ever Born

Table 27 shows the proportions dead of children ever born according to age of mother and sex of child for all women, as well as Indians and non-Indians. As we would expect if the data were accurate, the proportions dead of children ever born increase with increasing age of mother. The higher rates for the cohort 15–19 may result from the excess mortality risks to young mothers (particularly for pre-marital births), as well as from sampling fluctuations due to the relatively small number of births. As expected, proportions dead are consistently higher for male births as compared with female births. In summary, the limited data in table 27 do not suggest that children who died in their early years of life were omitted from the pregnancy histories, or that female deaths were more likely to be omitted than male deaths. A more detailed investigation of infant mortality rates is presented in the next section.

Table 27 Proportion Dead of Children Ever Born by Current Age for All Women (by Sex of Child) and by Ethnic Group

Current age of mother	All Women			Ethnic group	
	Total	Male	Female	Indian	Non-Indian
15–19	0.102	0.127	0.077	0.118	0.085
20–24	0.061	0.065	0.057	0.061	0.061
25–29	0.067	0.077	0.056	0.066	0.068
30–34	0.067	0.073	0.061	0.068	0.065
35–39	0.093	0.107	0.078	0.085	0.104
40–44	0.112	0.127	0.095	0.119	0.103
45–49	0.137	0.158	0.113	0.127	0.148
Total	0.093	0.106	0.079	0.090	0.097

Source: GFS 1975.

5 Infant and Child Mortality

For each child reported in the fertility histories who subsequently died, information was obtained on the date (month and year) of death. These data enable us to derive direct estimates of infant and child mortality (eg the proportions dying by ages 1, 2, 3 and 5) for periods dating back as much as 25 years before the survey. Alternatively, estimates of survivorship probabilities to ages 2, 3, and 5 (1_2, 1_3, 1_5), or the probability of dying before these ages ($_2q_0$, $_3q_0$, $_5q_0$) can be obtained by indirect estimation techniques (Brass and Coale 1968) from data on the proportion dead among children ever born.

If the mortality data are reliable, we expect the estimates to show certain trends and patterns: eg increases in the proportion dead among children ever born by age of mother at the time of the survey; declines in infant and child mortality rates over time; higher male mortality rates than female rates; a U-shaped pattern of infant mortality rates with age of mother at the time of birth; and a plausible age pattern of mortality. Significant deviations from these expected patterns might suggest errors in the basic data. Errors may arise as a result of selective omission of dead children, or incorrect reporting of the date of birth and/or death of children.

In this analysis, infant and child mortality data will be analysed for internal consistency and the estimates will be compared with those available from the vital registration data.

5.1 INFANT AND CHILD MORTALITY RATES FOR PERIODS IN THE PAST

Probabilities of death in the first year of life ($_1q_0$), the first two years ($_2q_0$) and the first five years ($_5q_0$) are shown in table 28 for periods preceding the survey. A fairly large and steady decline in infant and child mortality (of approximately 40 per cent) occurred during the period 10–25 years before the survey. For example, during this time the probability of dying in the first year of life decreased from .094 to .057. However, since the period 10–14 years prior to the survey, infant and child mortality rates have not shown any decline, but have remained remarkably constant up to the most recent period prior to survey. The progression to higher probabilities of dying for the more distant periods is consistent with the expected mortality trend and does not provide evidence that older cohorts of women have selectively omitted deceased children.

Infant and child mortality rates by calendar year are shown graphically in figure 4. All rates are three-year moving averages of single-year rates. We note a sharp increase in infant mortality (from 78 to 97 per 1000) during the early 1950s. Subsequently, there is a large decline until 1960 and a fairly long plateau from 1960–71. A similar trend is observed for the estimates of $_5q_0$. On the other hand, values of $_4q_1$ do not show an increase during the early 1950s.

It seems unlikely that infant mortality rates ($_1q_0$) increased and subsequently declined during the 1950s. The apparent increase may be a consequence of omissions of infant deaths in the earliest period among the older women. There also may have been a forward displacement of dates of infant deaths. Since the values of $_4q_1$ show a generally monotonic trend, it seems probable that errors have occurred mainly in the reports of infant rather than child deaths.

For successive periods further in the past, the average age of mother at the time of birth of the children becomes progressively younger. For example, for the period 20–24 years prior to the survey, no mother could have been older than 30 since no women older than 50 are included in the individual survey. Hence, strictly speaking, infant mortality rates for periods in the past should be compared with one another for comparable ages of motherhood. Table 29 shows these rates ($_1q_0$) for five-year periods prior to the survey, by age of mother at the time of birth of the child. Overall, we note the expected U-shaped pattern with the highest mortality rates at 15–19 and 40–44 (the sample size is very small for women aged 45–49). This U-shaped pattern emerges for most periods prior to the survey. Similar patterns have been found in other WFS surveys in Colombia, Mexico and Dominican Republic (Somoza 1980; Ordorica and Potter 1981; Guzmán 1980).

Table 30 shows the probabilities of dying in the first five years of life by five-year periods prior to the survey for male and female births. As expected, male rates are higher than female rates for each period. The very large sex differential in the remote periods (20–24 and 25–29 years prior to the survey) suggests that female infant or child deaths may have been omitted from the maternity histories.

Infant mortality rates are shown by subgroups (ethnic group, area of residence, and level of education), for five-

Table 28 Probabilities of Dying within One Year ($_1q_0$) Two Years ($_2q_0$) and Five Years ($_5q_0$) of Birth for Periods in the Past Derived from the Fertility Histories

Estimate	Years prior to survey				
	1–4	5–9	10–14	15–19	20–24
$_1q_0$	.056	.056	.057	.071	.094
$_2q_0$	*	.066	.065	.088	.116
$_5q_0$	*	.072	.072	.093	.125

*Incomplete exposure.
Source: GFS 1975.

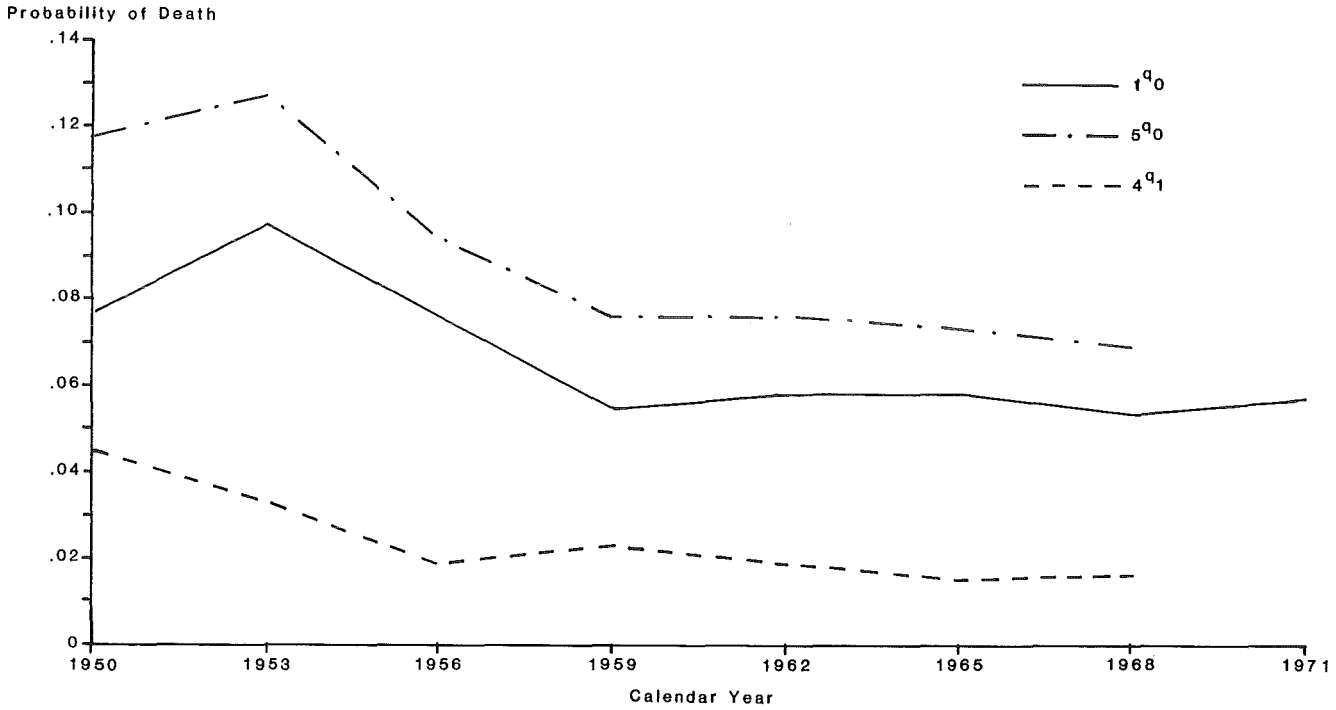

Figure 4 Probabilities of Dying within One ($_1q_0$) and Five ($_5q_0$) Years of Birth and between One and Five Years ($_4q_1$) by Calendar Year: 1950–71, 1975 GFS. (Probabilities are three-year moving averages.)

Table 29 Probability of Dying in the First Year of Life ($_1q_0$) for Periods prior to Survey and Age Group of Mother at the Time of the Child's Birth

Age group of mother at birth	Total	Years prior to survey					
		1–4	5–9	10–14	15–19	20–24	25–29
15–19	.074	.042	.075	.034	.086	.109	.110
20–24	.059	.054	.046	.051	.073	.072	.097
25–29	.058	.052	.045	.065	.049	.121	
30–34	.060	.052	.058	.063	.092		
35–39	.078	.073	.072	.097			
40–44	.136	(.160)	(.121)				
45–49	(.400)	(.250)					

Note: Values in parentheses are based on fewer than 100 births.
Source: GFS 1975.

year periods prior to the survey, in table 31. A decline in infant mortality through the 1950s and early 1960s and a subsequent plateau is reported for Indians and non-Indians, and for women residing in both urban and rural areas.

It appears as if the less educated women have omitted infant deaths in the earliest period. That is, it may be the case that reporting errors among women with less than four years of primary education have produced the artificial rise in infant mortality in the 1950s, previously noted in figure 4. Since the sampling errors associated with these estimates are high, it is difficult to determine the extent of omission and displacement for subgroups of the population.

As expected, the data in table 31 show generally higher infant mortality rates for the less educated women. However, there appears to be no consistent difference in infant mortality rates between women residing in urban and in rural areas. The data reveal higher rates for non-Indians as compared with Indians for the 1950s, but no substantial difference between ethnic groups in recent periods.

5.2 COMPARISON WITH VITAL REGISTRATION

Probabilities of death in the first year of life as derived from the GFS are compared with vital registration estimates in table 32. The estimates from the GFS are consistently higher than those based on vital registration data, which suggests more complete reporting of infant deaths in the survey. Although both sets of data show a decline in infant mortality from 1950–4 to 1965–9, the recent trends differ: the GFS data indicate a slight increase in the most recent period, while vital registration data suggest a continuous decline throughout the past. The slight increase observed in the most recent period from the survey data

Table 30 Proportion of Children Born at Least Five Years before the Survey who Died within Five Years of Birth ($_5q_0$) (According to Sex) for Periods prior to Survey

Years prior to survey	Total	Male	Female
5–9	0.072	0.086	0.058
10–14	0.072	0.078	0.066
15–19	0.093	0.109	0.078
20–24	0.125	0.148	0.098
25–29	0.162	0.196	0.115
Total	0.089	0.104	0.073

Source: GFS 1975.

might possibly be due to censoring (ie it is only in this period that births at high ages of maternity are represented).

The comparison above suggests that reports of infant deaths in the GFS are more complete than in the death registration data. In addition, several checks of the internal consistency of the infant and childhood mortality data have revealed the expected patterns: a generally monotonic decline with time (followed, however, by a long plateau), a U-shaped pattern of rates with age of mother at time of birth, and higher male rates than female rates. However, there is some evidence of reporting errors: infant deaths (especially female deaths) which occurred during the early 1950s may have been omitted from the maternity histories, or the dates of death (and birth) may have been displaced towards survey date. If such errors occurred, it seems that they were more frequent among women with little education.

Table 31 Probability of Dying within One Year of Birth ($_1q_0$) by Calendar Year Period (by Subgroup)

Subgroup	Period				
	1970–74	1965–69	1960–64	1955–59	1950–54
All women	.058	.056	.055	.077	.086
Ethnic group					
Indian	.054	.056	.055	.070	.072
Non-Indian	.061	.056	.055	.086	.090
Area of residence					
Urban	.065	.058	.064	.066	.085
Rural	.054	.055	.052	.082	.086
Level of education					
Less than four years' primary	.058	.077	.060	.080	.060
At least four years' primary	.060	.049	.053	.079	.101
Secondary or higher	.054	.052	.059	.047	.076

Source: GFS 1975.

Table 32 Probabilities of Dying within One Year of Birth ($_1q_0$) by Calendar Year Period according to GFS (1975) and Vital Registration Data

Period	GFS	Vital registration
1950–54	.084	.079
1955–59	.078	.065
1960–64	.055	.053
1965–69	.055	.049
1970–74	.058	.044

Sources: GFS 1975; Unpublished data from the Guyana Ministry of Economic Development

6 Summary and Conclusions

The goal of this report has been to assess the quality of the detailed individual survey data in order to determine the reliability of demographic estimates.

The nuptiality data obtained from the GFS are a valuable increment to the existing knowledge of mating patterns in Guyana. Analysis of the data has indicated a rise in the age at first union which is consistent with the recent decline in fertility. Proportions ever in a union at young ages have declined considerably, particularly among the Indians who were formerly characterized by a very low age at first marriage.

In general, data on proportions ever in a union for dates prior to the survey appear to be internally consistent. However, there appears to have been omission or displacement of early unions among the oldest cohorts, which has resulted in too low proportions ever married as of the young ages for these women, and misreports of age for the cohort 30–34 which has resulted in too high proportions ever married. Comparisons of the GFS data with data from the censuses have revealed some discrepancies which result from varying definitions of visiting unions.

The maternity histories provide evidence of a significant decline in fertility since about the mid-1960s, as a result of changes in both nuptiality patterns and marital fertility. The data have shown that a significant proportion of women are practising contraception in order to limit the size of their families. The fertility declines are particularly marked among the Indian population.

Although fertility trends as obtained from the survey data and the vital registration data are generally consistent, the estimated levels of fertility differ between the two sources, particularly for periods distant from the survey date. The consistently higher fertility rates obtained from the maternity histories (GFS) suggest more complete reporting of births in the survey. The close agreement in cumulative fertility estimates as obtained from the survey and the 1960 and 1970 censuses provides further evidence that the discrepancies in fertility rates noted above are due to deficiencies in the vital registration system.

However, there is some evidence that the fertility histories of the older cohorts have been somewhat affected by omissions of births and displacement of dates of births. In particular, the fertility schedules of the oldest cohorts are characterised by lower rates in the more distant periods as well as a slight concentration of births closer to the survey date. Although these discrepancies are probably due to reporting errors, there is some evidence that, in the post-second World War period, the birth rate was rising, partly as a result of general improvements in the standard of living, nutrition and health (Sukdeo 1973). The analysis of cohort-period fertility rates has also revealed unexpectedly high fertility estimates for the cohort aged 30–34. An examination of both nuptiality and fertility patterns for this cohort suggests that age misstatement is at least partly responsible for the discrepancies.

Analysis of the data on infant and child mortality has not revealed any substantial errors. Although the mortality data are generally consistent with expected patterns and trends, there is some evidence of omissions of (female) infant deaths or displacement of dates of death in the periods more distant from the survey date. Comparisons with vital registration data show consistently higher estimates from the survey which is suggestive of better quality of reporting in the GFS. The mortality estimates reveal a decline through the 1950s and early 1960s, but a subsequent levelling off of both infant and child mortality rates.

In general, the GFS data on age reporting, nuptiality, fertility, and infant and child mortality appear to be reliable. In particular, fertility and infant and child mortality data from the GFS are more complete than the corresponding data from vital registration. Although the analysis has pointed to numerous possible reporting errors, most errors are restricted to the oldest one or two cohorts and affect estimates for periods furthest from the survey date. This investigation suggests that the wealth of data contained in the GFS, much of which had not previously been available, will provide useful information for analysis and planning in Guyana.

A number of interesting discoveries concerning demographic trends in Guyana have been established as a result of this evaluation and the need for further and more refined analysis cannot be overemphasized. In view of the potentially rich source and satisfactory quality of the GFS data there are opportunities for further analysis embracing direct and indirect estimation of fertility levels and trends. The dramatic decline in total fertility warrants decomposition into its two components, namely rising age at marriage and declining marital fertility. Analysis by Ethnic, Socio-Economic and other subgroups also seems highly desirable. Another important topic is a more refined analysis of mating patterns, union formation, stability and dissolution and their effects on fertility levels. This would be useful not only in terms of providing a clear demographic and sociological picture of the society but also for comparative analysis.

Another subject which merits further study is the recent trend and levelling off of infant and child mortality. To identify some of the causal factors responsible for the trend should be of extreme demographic interest as well as having implications for policy making.

Finally the survey has provided the first data by which the vital registration system may be evaluated. The evidence so far suggests that events have not been sufficiently covered in the vital registration system. It would therefore be quite useful to quantify the extent and characteristics of this under-registration over time.

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Appendix A Cumulative Fertility Rates for Cohorts and Periods

Table A1 Cumulative Fertility Rates for Cohorts (P) and for Periods (F) and P/F Ratios for Five-Year Periods prior to Survey: Indians[a]

Age of cohort at end of period	Years prior to survey						
	0–4[b]	5–9	10–14	15–19	20–24	25–29	30–34
A Cumulative cohort rates (P)							
15–19	.16	.23	.28	.49	.43	.46	.38
20–24	1.42	1.63	2.34	2.08	2.11	1.97	
25–29	2.96	4.17	3.95	3.94	3.80		
30–34	5.14	5.18	5.56	5.37			
35–39	5.80	6.51	6.53				
40–48	6.85	7.08					
45–49	7.17						
B Cumulative periods (F)							
15–19	.16	.23	.28	.49	.43	.46	.38
20–24	1.35	1.58	2.13	2.13	2.08	2.04	
25–29	2.67	3.41	4.00	3.96	3.92		
30–34	3.65	4.64	5.62	5.53			
35–39	4.26	5.59	6.79				
40–44	4.60	6.14					
45–49	4.69						
C P/F ratios							
15–19	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20–24	1.05	1.03	1.10	.98	1.01	.97	
25–29	1.11	1.22	.99	.99	.97		
30–34	1.41	1.12	.99	.97			
35–39	1.36	1.16	.96				
40–44	1.49	1.15					
45–49	1.53						

[a]Includes only East Indians.
[b]Rates for 15–19 year olds included in the calculations are based on the crude assumption that the proportion of 15–19 year olds attending full-time school is the same for Indians and non-Indians.
Source: GFS 1975.

Table A2 Cumulative Fertility Rates for Cohorts (P) and for Periods (F) and P/F Ratios for Five-Year Periods prior to Survey: Non-Indians

Age of cohort at end of period	Years prior to survey						
	0–4[a]	5–9	10–14	15–19	20–24	25–29	30–34
A Cumulative cohort rates (P)							
15–19	.24	.21	.19	.34	.35	.28	.17
20–24	1.16	1.17	1.37	1.59	1.34	1.14	
25–29	2.53	2.96	3.11	2.84	2.48		
30–34	4.21	4.54	4.27	3.83			
35–39	5.45	5.24	4.99				
40–42	5.71	5.59					
45–49	5.72						
B Cumulative period rates (F)							
15–19	.24	.21	.19	.34	.34	.29	.18
20–24	1.20	1.18	1.21	1.58	1.41	1.27	
25–29	2.56	2.77	2.74	3.07	2.75		
30–34	3.81	4.20	4.16	4.42			
35–39	4.73	5.17	5.32				
40–44	5.20	5.76					
45–49	5.34						
C P/F ratios							
15–19	1.00	1.00	1.00	1.00	1.03	.97	.94
20–24	.97	.99	1.13	1.01	.95	.90	
25–29	.99	1.07	1.14	.93	.90		
30–34	1.10	1.08	1.03	.87			
35–39	1.15	1.01	.97				
40–44	1.10	.97					
45–49	1.07						

[a]Rates for 15–19 year olds included in the calculations are based on the crude assumption that the proportions of 15–19 year olds attending full-time school is the same for Indians and non-Indians.
Source: GFS 1975.