Scientific Reports

NUMBER 34 JULY 1982

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Evaluation of the Jamaica Fertility Survey 1975-76

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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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El proyecto está a cargo del Instituto Internacional de Estadística en cooperación con la Unión Internacional para el Estudio Científico de la Población y con la colaboración de las Naciones Unidas. Es financiado principalmente por el Fondo de las Naciones Unidas para Actividades de Población y por la Agencia para el Desarrollo Internacional de los Estados Unidos.
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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.

While most of these studies are being carried out by participants from the countries concerned, within the framework of workshops held in London, this study was undertaken by a WFS staff member, partly in fulfilment of the WFS objective of evaluating all surveys' data, but more specifically for the Caribbean Seminar on Analysis of Union Status and Partners Data, held in Barbados in November 1979. The report was redrafted once on the basis of comments given at the Seminar, and again after review by WFS staff, in particular Dr Shea Oscar Rutstein, co-ordinator of the data evaluation workshops, Mr John Cleland, Chief of the National Analysis Section, and Dr Robert Lightbourne, country co-ordinator for Jamaica. The assistance of these individuals and of participants in the 1979 Seminar in the successful completion of the work is greatly appreciated.

DIRK J. VAN DE KAA
Project Director

1 Introduction

The Jamaica Fertility Survey (JFS) was conducted as part of the World Fertility Survey (WFS) in order to obtain information on fertility levels, trends and factors directly affecting fertility. The survey was organized within the Caribbean Programme of the WFS. Fieldwork started in November 1975 and was completed in January 1976.

The survey sample was nationally representative, and in keeping with standard WFS practice both a household survey and the detailed individual survey were carried out. From a stratified one per cent sample 4968 households were identified, and 4613 of these were successfully interviewed. The enumerated households contained 3308 eligible females of whom 3096 provided complete interviews. Non-response was quite low – the success rate for households being 92.9 per cent and for individual women, 93.8 per cent. About half of non-response in the case of households and about 35 per cent in the case of the individual survey was caused by refusals, a somewhat higher rate of refusal than in other WFS surveys.

Primarily to identify eligible women, the WFS household schedule was adapted for the purpose of listing household members, and obtained relatively little data, namely age, sex, relationship to head of household, school attendance for 15–19 year olds, type of water supply and possession of electricity in the household.

The individual questionnaire was administered to all women aged 15–49 in the household, regardless of marital status, except for females aged 15–19 who were attending primary or secondary school on a full-time basis.

The seven-section WFS core individual questionnaire was modified to become a WFS Caribbean core, with six standard Caribbean sections and one section local to Jamaica. The Caribbean sections on birth history, marriage history and work history differed from the WFS core in several respects. The birth history was modified to include both live births and other pregancies in a single integrated history. The marriage history section was radically expanded to collect detailed data on the history of partners and union types; this new union status and partners history was placed before the contraceptive knowledge and use section so that women never in a union were not asked about contraception.

This survey is a useful source of estimates on fertility and related factors and will supplement other existing Jamaican data sources. There is need for an evaluation of the data, however, because a retrospective survey may be subject to response errors peculiar to this type of survey, which may bias estimates. These response errors, discussed in section 3, arise mainly from the misreporting of age and the omission and displacement of vital events (Brass 1978, Potter 1977, Goldman *et al* 1979). The aims of this analysis are, therefore, to evaluate the quality of the data, to search out any apparent errors or inconsistencies in response and to determine the extent to which these errors bias demographic estimates.

The present analysis will be confined to an evaluation of data in the individual questionnaire, the only exception being the analysis of age reporting in the household survey. It 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 worthwhile here because of the very limited schedule used in the household survey.

The main topics treated in this paper are age reporting, nuptiality, fertility and infant and child mortality. Emphasis is laid on the evaluation of the nuptiality and fertility data, however, because in the case of Jamaica these are the most critical areas, both in their importance and in their likelihood of containing errors.

2 Background Information

Jamaica is an island in the north-west sector of the Caribbean sea, situated 90 miles south of Cuba and 100 miles west of Haiti, and covers 4243 square miles (11 030 square kilometres).[1] The population as at 31 December 1976 was estimated at 2 084 200, implying an overall density of 491 persons per square mile, but much of the country is mountainous or has low rainfall and is sparsely occupied. In 1970, Jamaica was 34 per cent urban with 26 per cent of the total population in and around Kingston, the capital city.

The inhabitants are English speaking, Jamaica having been a British colony between 1655 and 1962, when the island achieved independence. The people of Jamaica are largely of African descent, with about ten per cent of the population belonging to other groups at the time of the 1970 census. The majority of the population belongs to various Christian Protestant denominations.

Since 1844, when the first census counted 377 433 people, Jamaica's population has increased more than five-fold. During the course of the 20th century, Jamaica's pattern of population growth has shown no steady trend. Population growth has occurred at intercensal rates varying between 0.3 and 1.7 per cent annually, but has been retarded substantially by emigration. The sharp variation observed in population growth rates has been produced by widely fluctuating levels of fertility and sharply oscillating currents of international migration, together with a relatively steady mortality decline. Crude death rates have fallen from 32 per thousand in 1844–61 to 8.2 per thousand in 1960–70 to 7.1 per thousand in 1976, a fall in mortality that has exerted a steadily growing and powerful upward pressure on rates of population growth. On the other hand, crude birth rates have fallen, risen, then fallen again; the 1891–1911 period saw an intercensal crude birth rate of 39.5 per thousand, declining to 27.9 during 1911–21, rising to 39.1 during the 1960–1970 decade, then falling to a crude birth rate of 29.3 for the year 1976. Against this backdrop of declining mortality and fluctuating fertility, international migration rates have oscillated sharply; there has been heavy net emigration in some periods, and moderate immigration in others. Between 1970 and 1976, emigration has varied between 16.8 and 5.3 per thousand, with a concomitant variation in annual population growth rates between 12 and 20 per thousand. In the absence of heavy migratory outflows, Jamaica's population would have grown much more rapidly: in the 1960–70 decade it would have grown at 3 per cent per year instead of the recorded 1.2 per cent, had it not been for migration.

The level of education is quite high – among the sample population only 1.7 per cent of interviewed women and 2.9 per cent of their partners had no schooling at all. Among women 87 per cent had at least four years of primary schooling and among their partners 90 per cent did so. Given this high level of literacy and education, we would expect reporting of dates of vital events to be reasonably accurate.

[1] This chapter uses extracts from *The Jamaican Fertility Survey, 1975–76: A Summary of Findings*, WFS, 1980.

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.[2] These errors arise from various sources such as faults in the design of the questionnaire, lack of knowledge among the 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 five and two (Goldman *et al* 1979, Guzmán 1980). More significantly, errors in reporting current age may also arise from the tendency 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 the 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 of misinterpretation of the questionnaire. 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 Vital Events

A third major error observed in fertility surveys arises from misplacement of the time of occurrence of past vital events (Brass 1978 and 1980, Potter 1977a). Potter (1977a) 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 data, 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 major response errors are inter-related and the effects of one type may be indistinguishable from those of 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 *et al* 1979 for results of the Nepal fertility survey). In the following sections, errors of omission and displacement will be assessed within the following demographic subjects: nuptiality, fertility and infant and child mortality.

[2] This chapter is reproduced from Balkaran, Sundat (1982). Evaluation of the Guyana Fertility Survey 1975. *WFS Scientific Reports* no 26.

4 Evaluation of Age Reporting

4.1 AGE REPORTING IN THE HOUSEHOLD SURVEY

The single year of age distribution of household members, by sex and by urban/rural residence is shown in table 1. Visual inspection alone shows that reporting was in general quite reasonable, especially for the under 15 year olds. The only exception in this group is the apparent omission of male infants, judging from the sex ratio of 87 among infants. The high level of emigration makes it difficult to draw any conclusions about omission at adult ages from the survey data.

Heaping at the preferred digits of 5 and 0 is more common among adults, and among males, and in rural areas. Among females the heaping at age 50 is very high – the sex ratio is only 63, compared to an average sex ratio of 103 at ages 45–49, and 74 at ages 51–55. This concentration of females at age 50 suggests that in addition to the usual tendency of respondents to round ages to the nearest 0 or 5 digit, interviewers may have pushed some 45–49 year-old women into age 50, in order to exclude them from the individual survey. The unexpectedness of this heaping for females at age 50 is confirmed by the much less severe heaping observed in the 1970 census at age 50.

Myers' Index was calculated for males and females and for both the JFS household population and the 1970 census to evaluate age-heaping in the JFS:

	JFS	1970 census
Males	16.2	14.4
Females	9.4	13.4

Myers' Blended Index ranges from 0, which would occur where no digit preference existed, to 180, where all ages would end in the same digit. The indices observed in Jamaica are reasonably low, although they do indicate that some heaping existed. They may be compared to the index of 0.8 for the 1960 US census, for example, showing that digit preference was by no means negligible in Jamacia.

Collapsing the single-year groups into five-year groups is a useful technique for measuring 'gross age mis-statement', the kind of misreporting that even five-year grouping cannot disguise. Five-year age groups and sex ratios are shown for the survey and the 1970 census in table 2. The most prominent error that emerges is misreporting at ages 50–54 and 60–64 for females in the JFS, due exclusively to the preference for ages 50 and 60. No similar degree of heaping is seen in the 1970 census, or for males in the household survey. A second possible error in age reporting in the household survey exists at ages 30–34 for females, which has almost the same proportion as ages 35–39. This would seem unlikely, since in 1970 the roughly equivalent age groups, 25–29 and 30–34, differed by about 20 per cent. Interestingly, males aged 30–34 and 35–39 showed roughly the same differential in the household survey and in the equivalent census age groups. With the exception of these two cases, the five-year age distribution of the household survey shows no other unusual features. The age pyramid for the survey, shown in figure 1, demonstrates this visually.

An unexpected difference between the 1970 census and the 1975 JFS population distributions emerges: the sex ratio at adult ages is consistently lower for the census than

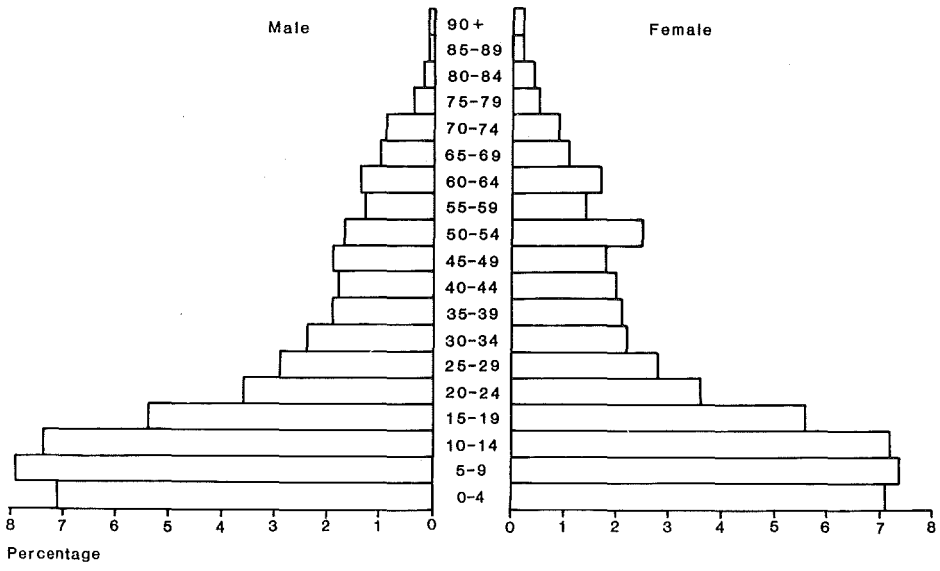

Figure 1 Age-sex Pyramid of Household Population of the 1975–76 JFS, using Five-Year Age Groups

it is for the survey. At ages 20–49 in 1975, parallel to ages 15–44 in 1970, the sex ratio roughly averages almost 100 in 1975, and about 90 in 1970. This differential may be due to undercounting of males during the census, since it seems unlikely that such strong selective emigration could account for the change in five years.

Age ratios were calculated for a few central age groups to detect any further inconsistencies. An age ratio is calculated as follows:

$$\frac{\text{age group of interest, eg 35–39}}{(30\text{–}34 + 40\text{–}44)/2}$$

and it should approximate 1.00. Age ratios were calculated from the JFS household data for males and females aged 30–54.

Age group	Males	Females
25–29	0.98	0.98
30–34	0.99	0.88
35–39	0.89	1.01
40–44	0.99	1.01
45–49	1.04	0.80
50–54	1.09	1.56

Some of these fluctuations could be real if particular age groups were more affected by emigration. The low ratios for females aged 30–34 and 45–49 are noticeable. While it is clear that some 45–49 year old females went into the next older group, it is not as straightforward to see where the 30–34 year old females may have gone. The 35–39 group may contain some 30–34 year olds, but it is possible that the lack of 30–34 year old females may be partly real,

Table 1 Distribution of Household Population by Single Years of Age and by Sex, for the Total Sample and for Urban and Rural Subgroups, with Sex Ratios (SR)

Age	Total					Urban					Rural				
	Male		Female		SR	Male		Female		SR	Male		Female		SR
0	222	2.3	256	2.6	87	104	2.9	119	3.1	87	118	1.9	137	2.3	86
1	265	2.7	265	2.7	100	87	2.4	84	2.2	104	178	2.9	181	3.0	98
2	271	2.8	254	2.6	107	94	2.6	95	2.5	99	177	2.9	159	2.7	111
3	296	3.1	310	3.2	95	116	3.2	115	3.0	101	180	3.0	195	3.3	92
4	307	3.2	285	2.9	108	123	3.4	108	2.8	114	184	3.0	177	3.0	104
5	312	3.2	284	2.9	110	117	3.3	104	2.7	113	195	3.2	180	3.0	108
6	275	2.9	249	2.5	110	88	2.5	88	2.3	100	187	3.1	161	2.7	116
7	302	3.1	300	3.1	101	105	2.9	114	3.0	92	197	3.3	186	3.1	106
8	315	3.3	278	2.8	113	84	2.3	89	2.6	94	231	3.8	179	3.0	129
9	315	3.3	314	3.2	100	111	3.1	95	2.5	117	204	3.4	219	3.7	93
10	318	3.3	285	2.9	112	112	3.1	101	2.6	111	206	3.4	184	3.1	112
11	270	2.8	270	2.8	100	94	2.6	87	2.3	108	176	2.9	183	3.1	96
12	326	3.4	295	3.0	111	106	3.0	86	2.2	123	220	3.6	209	3.5	105
13	255	2.6	286	2.9	89	85	2.4	87	2.3	98	170	2.8	199	3.3	85
14	258	2.7	257	2.6	100	78	2.2	100	2.6	78	180	3.0	157	2.6	115
15	266	2.8	230	2.3	116	97	2.7	92	2.4	105	169	2.8	138	2.3	122
16	204	2.1	218	2.2	94	66	1.8	85	2.2	78	138	2.3	133	2.2	104
17	157	1.6	235	2.4	67	53	1.5	108	2.8	49	104	1.7	127	2.1	82
18	229	2.4	211	2.2	109	93	2.6	93	2.4	100	136	2.2	118	2.0	115
19	187	1.9	179	1.8	104	64	1.8	83	2.2	77	123	2.0	96	1.6	128
20	179	1.9	129	1.3	139	75	2.1	59	1.5	127	104	1.7	70	1.2	149
21	131	1.4	152	1.6	86	63	1.8	83	2.2	76	68	1.1	69	1.2	99
22	117	1.2	138	1.4	85	56	1.6	72	1.9	78	61	1.0	66	1.1	92
23	132	1.4	142	1.4	93	64	1.8	62	1.6	103	68	1.1	80	1.3	85
24	129	1.3	135	1.4	96	67	1.9	72	1.9	93	62	1.0	63	1.1	98
25	156	1.6	121	1.2	129	72	2.0	66	1.7	109	84	1.4	55	0.9	153
26	110	1.1	105	1.1	105	67	1.9	60	1.6	112	43	0.7	45	0.8	96
27	107	1.1	110	1.1	97	49	1.4	60	1.6	82	58	1.0	50	0.8	116
28	91	0.9	104	1.1	88	48	1.3	59	1.5	81	43	0.7	45	0.8	96
29	98	1.0	107	1.1	92	58	1.6	61	1.6	95	40	0.7	46	0.8	87
30	147	1.5	108	1.1	136	76	2.1	60	1.6	127	71	1.2	48	0.8	148
31	86	0.9	80	0.8	108	40	1.1	44	1.1	91	46	0.8	36	0.6	128
32	98	1.0	88	0.9	111	49	1.4	50	1.3	98	49	0.8	38	0.6	129
33	63	0.7	74	0.8	85	34	0.9	36	0.9	94	29	0.5	38	0.6	76
34	62	0.6	68	0.7	91	36	1.0	31	0.8	116	26	0.4	37	0.6	70

Table continues on p. 14

Table 1 Distribution of Household Population by Single Years of Age, by Sex and Urban/Rural Residence (*contd*)

Age	Total					Urban					Rural				
	Male		Female		SR	Male		Female		SR	Male		Female		SR
35	100	1.0	100	1.0	100	47	1.3	49	1.3	96	53	0.9	51	0.9	104
36	83	0.9	82	0.8	100	41	1.1	44	1.1	93	42	0.7	38	0.6	111
37	54	0.6	67	0.7	81	27	0.8	23	0.6	117	27	0.4	44	0.7	61
38	64	0.7	79	0.8	81	21	0.6	42	1.1	50	43	0.7	37	0.6	116
39	59	0.6	75	0.8	79	29	0.8	22	0.6	132	30	0.5	53	0.9	57
40	123	1.3	102	1.0	121	54	1.5	40	1.0	135	69	1.1	62	1.0	111
41	48	0.5	54	0.6	89	23	0.6	25	0.6	92	25	0.4	29	0.5	86
42	64	0.7	81	0.8	79	28	0.8	29	0.8	97	36	0.6	52	0.9	69
43	56	0.6	81	0.8	69	24	0.7	37	1.0	65	32	0.5	44	0.7	73
44	65	0.7	60	0.6	108	24	0.7	21	0.5	114	41	0.7	39	0.7	105
45	95	1.0	74	0.8	128	29	0.8	30	0.8	97	66	1.1	44	0.7	150
46	67	0.7	75	0.8	89	27	0.8	32	0.8	84	40	0.7	43	0.7	93
47	53	0.5	68	0.7	78	23	0.6	27	0.7	85	30	0.5	41	0.7	73
48	75	0.8	64	0.7	117	21	0.6	24	0.6	88	54	0.9	40	0.7	135
49	67	0.7	65	0.7	103	23	0.6	29	0.8	79	44	0.7	36	0.6	122
50	103	1.1	164	1.7	63	28	0.8	68	1.8	41	75	1.2	96	1.6	78
51	47	0.5	86	0.9	55	20	0.6	29	0.8	69	27	0.4	57	1.0	47
52	72	0.7	88	0.9	82	21	0.6	29	0.8	72	51	0.8	59	1.0	86
53	52	0.5	75	0.8	69	20	0.6	21	0.5	95	32	0.5	54	0.9	59
54	54	0.6	74	0.8	73	19	0.5	25	0.6	76	35	0.6	49	0.8	71
55	59	0.6	61	0.6	97	11	0.3	19	0.5	58	48	0.8	42	0.7	114
56	57	0.6	62	0.6	92	12	0.3	17	0.4	71	45	0.7	45	0.8	100
57	46	0.5	46	0.5	100	17	0.5	14	0.4	121	29	0.5	32	0.5	91
58	43	0.4	70	0.7	61	15	0.4	16	0.4	94	28	0.5	54	0.9	52
59	40	0.4	38	0.4	105	13	0.4	11	0.3	118	27	0.4	27	0.5	100
60	107	1.1	124	1.3	86	23	0.6	34	0.9	68	84	1.4	90	1.5	93
61	32	0.3	45	0.5	71	8	0.2	20	0.5	40	24	0.4	25	0.4	96
62	55	0.6	53	0.5	104	16	0.4	16	0.4	100	39	0.6	37	0.6	105
63	39	0.4	56	0.6	70	12	0.3	14	0.4	86	27	0.7	42	0.7	64
64	42	0.4	43	0.4	98	11	0.3	15	0.4	73	31	0.5	28	0.5	111
65	95	1.0	83	0.8	114	19	0.5	20	0.5	95	76	1.3	63	1.1	121
66	30	0.3	30	0.3	100	6	0.2	9	0.2	67	24	0.4	21	0.4	114
67	20	0.2	40	0.4	50	4	0.1	13	0.3	31	16	0.3	27	0.5	59
68	34	0.4	28	0.3	121	12	0.3	7	0.2	171	22	0.4	21	0.4	105
69	23	0.2	29	0.3	79	8	0.2	12	0.3	67	15	0.2	17	0.3	88
70	80	0.8	58	0.6	138	13	0.4	18	0.5	72	67	1.1	40	0.7	168
71	18	0.2	15	0.2	120	3	0.1	7	0.2	43	15	0.2	8	0.1	188
72	38	0.4	50	0.5	76	9	0.3	12	0.3	75	29	0.5	38	0.6	76
73	24	0.2	22	0.2	109	8	0.2	8	0.2	100	16	0.3	14	0.2	114
74	13	0.1	21	0.2	62	3	0.1	6	0.2	50	10	0.2	15	0.3	67
75	41	0.4	50	0.5	82	8	0.2	15	0.4	53	33	0.5	35	0.6	94
76	8	0.1	15	0.2	53	3	0.1	3	0.1	100	5	0.1	12	0.2	42
77	10	0.1	9	0.1	111	0	0.0	2	0.1	0	10	0.2	7	0.1	143
78	13	0.1	19	0.2	68	2	0.1	8	0.2	25	11	0.2	11	0.2	100
79	14	0.1	10	0.1	140	3	0.1	3	0.1	100	11	0.2	7	0.1	157
80	17	0.2	37	0.4	46	1	0.0	8	0.2	16	16	0.3	29	0.5	55
81	3	0.0	5	0.1	60	0	0.0	4	0.1	–	3	0.0	1	0.0	300
82	8	0.1	9	0.1	89	3	0.1	0	0.0	–	5	0.1	9	0.2	56
83	5	0.1	11	0.1	45	1	0.0	9	0.2	11	4	0.1	2	0.0	200
84	4	0.0	15	0.2	27	0	0.0	2	0.1	0	4	0.1	13	0.2	31
85	8	0.1	9	0.1	89	0	0.0	4	0.1	0	8	0.1	5	0.1	160
86	2	0.0	4	0.0	50	0	0.0	0	0.0	0	2	0.0	4	0.1	50
87	4	0.0	9	0.1	44	0	0.0	0	0.0	0	4	0.1	9	0.2	44
88	2	0.0	3	0.0	67	1	0.0	2	0.1	50	1	0.0	1	0.0	100
89	1	0.0	4	0.0	25	0	0.0	1	0.0	0	1	0.0	3	0.1	33
90 +	11	0.1	40	0.4	27	3	0.1	8	0.2	38	8	0.1	32	0.5	25
99	130	1.3	41	0.4	–	55	1.5	27	0.7	–	75	1.2	14	0.2	–
Total	9643	49.6	9806	50.4	98	3589	48.3	3849	51.7	93	6054	50.4	5957	49.6	102

Table 2 Distribution of Household Survey Population and 1970 Census Population, by Five-Year Age Groups with Sex Ratios

Age	1975 JFS household population			1970 census population		
	% Male	% Female	Sex ratio	% Male	% Female	Sex ratio
0–4	7.1	7.1	99	8.0	7.9	102
5–9	7.9	7.4	107	8.4	8.3	101
10–14	7.4	7.2	102	6.8	6.7	101
15–19	5.4	5.6	97	4.4	4.6	94
20–24	3.6	3.6	99	3.2	3.7	88
25–29	2.9	2.8	103	2.7	2.9	92
30–34	2.4	2.2	109	2.1	2.4	90
35–39	1.9	2.1	89	2.1	2.4	86
40–44	1.8	2.0	94	2.0	2.2	91
45–49	1.9	1.8	103	1.8	2.0	93
50–54	1.7	2.5	67	1.8	1.9	92
55–59	1.3	1.4	88	1.6	1.6	99
60–64	1.4	1.7	86	1.4	1.5	93
65–69	1.0	1.1	96	1.0	1.1	93
70–74	0.9	0.9	104	0.7	0.8	86
75–79	0.4	0.5	83	0.4	0.5	77
80–84	0.2	0.4	48	0.2	0.3	58
85–89	0.1	0.2	59	} 0.1	} 0.3	} 44
90 +	0.1	0.2	28			

since neither the 25–29 nor the 35–39 groups are exceptionally large.

4.2 AGE REPORTING IN THE INDIVIDUAL SURVEY

Table 3 shows the single-year age distribution of women aged 15–49 according to the age they reported in the individual interview. The 15–19 year olds who were attending school, and who were therefore not eligible for the individual survey, were included in this table according to their household age. Residence of this group was also taken from the household, and they are included both in the residence and in the education distributions.

There is some evidence of heaping at older ages, at the digits 0 and 5: for the total population this is not very strong, and the worst instance is at age 35. Heaping is slightly worse for rural than urban areas, however, with ages 35, 40 and 45 being preferred in rural areas, and in urban areas, ages 35 and 45. Unexpectedly, ages 20 and 25 have very low proportions in the total population and this shows up partly in residence and education groups. None of these irregularities in distribution are very large, and the fact that they occur in reverse – that ages 20 and 25 have dips while 35, 40 and 45 have peaks – raises the possibility that these irregularities are, if not random, at least not particularly significant.

The single-year age distributions are collapsed into five-year groups in table 4 in order to detect any gross age misstatements. The JFS individual interview distribution is compared to the 1970 census and to the JFS household distribution. The JFS household and individual distributions are very similar, the main difference being that the 15–19 group is slightly larger and the 40–44 group is slightly smaller in the individual survey than in the household survey. There is no evidence that age reporting was significantly better in the individual interview than at the household interview.

Comparison of the 1970 census distribution of ages 10–44 with the 1975 JFS individual survey distribution of ages 15–49 does show one disagreement, however. Census data suggest that in 1975 age groups 30–34 and 35–39 should be approximately 12 and 9.5 per cent of the 15–49 total respectively. However, the JFS data show that in the total population these groups are almost equal with about 10.5 per cent each. The subgroup distributions show that the urban and the two higher education groups have differentials of the expected order of magnitude, but rural women show the unexpected difference of the 35–39 group being larger than the 30–34 group. The lowest education group also has more 35–39 year olds than 30–34 year olds, but if education is rising this is to be expected. If an error in age reporting did occur, therefore, (with some transference of 30–34 year olds into the 35–39 age groups), it would seem to characterize mainly rural women. The alternative explanation of external migration, selective of women aged 30–34, does not seem very likely. One general conclusion that can be drawn from the comparison is that some emigration of women aged 15–44 in 1970 occurred during the five-year period 1970–75, resulting in slight falls in the per cent of five-year groups within age 20–49, and accompanying rise in the proportion aged 15–19 in 1975 relative to 1970. Although increases in mortality as age increases will explain some of this shift in distribution, adult mortality is too low to account for the greater part of the change.

4.3 COMPLETENESS OF DATE REPORTING

Completeness of date reporting may be used as a measure of accuracy because although a completely reported date is not necessarily accurate, the two qualities are often associated. In general, most Jamaican women report the dates of vital events completely, giving month and year,

Table 3 Per Cent Distribution of Women Aged 15–49 according to Single Year of Age Reported in the Individual Interview[a], for Residence and Education Groups

Age	Total	Urban	Rural	Primary education		Secondary/higher[b]	
				< 7 yrs	7–8 yrs	(1)	(2)
15	6.4	5.5	7.1	1.3	0.7	16.0	1.0
16	6.0	5.0	6.9	1.9	1.7	13.5	3.5
17	6.2	6.0	6.4	2.1	3.6	12.0	7.6
18	5.4	5.4	5.4	1.7	3.4	10.3	10.2
19	4.5	4.4	4.5	2.3	3.9	6.9	8.8
20	3.5	3.2	3.8	3.0	3.3	4.0	6.7
21	3.9	4.5	3.4	2.2	4.7	4.5	7.5
22	3.2	3.7	2.7	1.2	4.5	3.4	5.7
23	3.8	3.4	4.2	3.9	4.3	3.3	5.5
24	3.5	3.9	3.0	3.7	4.6	2.2	3.6
25	2.8	3.7	2.1	2.8	3.5	2.3	3.9
26	3.0	3.3	2.6	2.8	3.4	2.7	4.5
27	2.8	3.7	2.0	3.0	3.8	1.6	2.7
28	2.7	3.3	2.2	2.2	3.9	1.9	3.2
29	2.7	3.3	2.2	3.0	3.4	1.7	2.8
30	2.7	3.3	2.2	3.0	3.9	1.4	2.3
31	2.1	2.6	1.7	2.3	3.5	0.7	1.2
32	1.8	2.0	1.7	1.9	2.4	1.2	1.9
33	2.3	2.3	2.4	2.4	3.6	1.0	1.7
34	1.7	1.9	1.6	2.9	2.0	0.6	1.0
35	2.4	2.3	2.5	3.4	2.9	1.2	1.9
36	2.0	2.1	2.0	3.0	2.5	0.8	1.3
37	2.0	1.8	2.2	2.9	2.7	0.5	0.9
38	1.9	1.8	2.0	3.3	2.1	0.5	0.9
39	2.2	1.8	2.5	4.1	2.3	0.6	1.0
40	2.3	1.6	2.9	4.9	2.3	0.2	0.4
41	1.7	1.6	1.8	1.9	2.5	0.8	1.3
42	1.9	1.7	2.1	3.3	2.0	0.7	1.2
43	2.0	1.4	2.4	3.2	2.3	0.6	1.0
44	1.5	1.3	1.7	3.6	0.8	0.4	0.6
45	2.0	1.8	2.2	3.7	1.9	0.8	1.3
46	1.9	1.7	2.1	3.3	2.2	0.5	0.8
47	2.0	1.7	2.3	3.5	2.3	0.5	0.8
48	1.5	1.2	1.7	3.0	1.3	0.3	0.5
49	1.7	1.7	1.7	2.9	1.8	0.5	0.9
Number of women	3615	1677	1938	1069	1268	1278	759

[a] 15–19 year olds attending school are included, according to their household age.

[b] Group (1) includes the 15–19 year olds, attending school, assuming that all were in secondary or higher level schools, and group (2) excludes them.

with a small proportion locating events in terms of the number of years ago or as their age at the event. Only 6 per cent of respondents gave their age instead of the date of their own birth, about 10 per cent of pregnancies were dated as years ago, most of these being non-live births, and 20–30 per cent of the dates of deaths of children were given as years ago (tables 5 and 6). The tendency to report date of own birth as age was much higher for older women, however: while age groups under 35 had at most 3.5 per cent reporting age rather than date of birth, the three age groups above 35 had 11–15 per cent doing so.

While date reporting was in general good, the date of entry into the first union was not as accurately reported – 47 per cent of all women gave their age at entry rather than a date.[3] Although this was strongly related to current age, with women aged 30+ having 50 per cent or more reporting age rather than date, it was quite high even for the youngest age group (29 per cent).

[3] The questions were: 'In what month and year did this first relationship start?' If don't know, 'How old were you when this first relationship started?'

Table 4 Per Cent Distribution of Female Population aged 15–49 by Five-Year Age Groups for JFS Individual and Household Surveys, and for Residence and Education Subgroups for Individual Interviews; also for1970 Census, Age 10–44

Age at 1975–76 survey	JFS individual interview	JFS household interview	Age at 1970 census	1970 census
15–19	28.4	27.8	10–14	26.9
20–24	17.8	18.0	15–19	18.6
25–29	14.0	14.2	20–24	14.8
30–34	10.8	10.8	25–29	11.7
35–39	10.6	10.4	30–34	9.4
40–44	9.3	9.8	35–39	9.6
45–49	9.1	9.0	40–44	9.0

Age at 1975–76 survey	1975 JFS				
	Urban	Rural	Primary		Secondary or higher
			< 7 yrs	7–8 yrs	
15–19	26.2	30.3	9.3	13.3	59.2
20–24	18.7	17.1	14.1	21.4	17.2
25–29	17.3	11.1	13.8	18.0	10.0
30–34	12.2	9.5	12.5	15.4	4.8
35–39	9.9	11.2	16.8	12.5	3.6
40–44	7.6	10.9	16.9	9.9	2.7
45–49	8.2	9.9	16.6	9.5	2.5

Table 5 Per Cent of Ever-in-Union Women Reporting Date of Own Birth and Date of First Union as Age, by Current Age

Date	15–19	20–24	25–29	30–34	35–39	40–44	45–49	Total
Date of birth	1	2	3	4	11	13	15	6
Date of first union	29	43	47	51	52	55	60	47
Number of women	303	565	485	384	371	333	324	2765

Source: JFS, 1975–76

Table 6 Per Cent of Women Reporting Date of Pregnancy and Date of Death of Children as Years Ago, by Pregnancy Order for the First Seven Pregnancies

Pregnancy order	Date of pregnancies		Date of child's death		
	Per cent years ago	N	Birth order	Per cent years ago	N
1	7.5	2481	1	21.5	181
2	9.8	2012	2	20.3	133
3	8.3	1592	3	17.7	113
4	10.2	1261	4	18.5	81
5	10.2	974	5	25.4	67
6	8.8	747	6	28.6	42
7	9.8	560	7	16.7	30

Source: JFS, 1975–76

5 Nuptiality

In the context of the West Indies, where visiting unions exist, it is not easy to precisely date the beginning of the first union. Consequently, more attention than usual needs to be given to evaluating the age at entering the first union. In the case of Jamaica, data on nuptiality may suffer from a further problem: the existence of different types of unions may interact with dating problems, increasing the probability of error.

There are three types of union – the visiting, when the woman has a regular sexual relationship that does not involve cohabitation; the common law, where the couple live together but are not legally married; and the married, where the couple live together and are legally married.

The definition of visiting union status is subjective, with the phrase 'more or less steady' relationship being used in WFS Caribbean surveys. Because of the impreciseness of the term, it is possible that women may interpret it differently – for example older women may no longer consider an early visiting relationship to be a union, while younger women currently in such a union, or not long out of one, would consider it as a union simply because of the immediacy of the experience. Roberts (1975) found that in the majority of visiting unions the strength of the union (measured by hours partners spent together, hours father spent with children, monetary support, etc) was very high. A small proportion of visiting unions did not fit this general type, however, and Roberts suggests that a subgroup of 'casual relationships' should be distinguished from the visiting union.

Women may change the status of their union, remaining with the same partner, or they may change their partner. Because changes are frequent, and because some unions are of short duration, precise dating becomes a problem. In addition, it is possible that the more stable common law and married unions are more likely to be correctly dated than the visiting unions. Further, the first union is more frequently a visiting union, increasing the chance that the date or age of entering the first union may be incorrect.

A second source of differerence between Jamaica (or other Caribbean surveys) and other WFS surveys occurred because girls aged 15–19 who were attending school full-time were assumed to have never been in any union, and to be childless. This group was omitted from the survey. This assumption probably did not introduce any strong bias; however, to the extent that secondary school attenders participate in unions or have children, the survey data on these basic topics will be biased. In this evaluation the assumption that the group of 15–19 year olds in school had never been in union and were childless is accepted in the absence of external evidence to prove or refute it. Denominators are adjusted to take account of this group in obtaining the various demographic measures.

Comparison of survey data with external sources, such as the census or vital registration, is limited by differences in definitions. Registration statistics include only legal marriages and are therefore useless for evaluation. The census definition of common law and married unions are comparable with survey definitions, but visiting unions are defined differently. The survey has a wider definition, including all women with a regular non-cohabiting sexual relationship. The census classifies women as being in a visiting union only if they are currently without a co-habiting partner or husband and have had a child within the preceding year. In evaluating union status distribution, census definitions are applied to survey data to overcome this problem. Given these limitations on comparison with external sources, internal consistency checks are more emphasized in evaluating union status data here.

5.1 SOCIO-ECONOMIC BACKGROUND OF UNION GROUPS

The social background of the union groups is also relevant to the quality of date reporting and of reporting in general. Education is one of the most important background variables in Jamaica. We find that among current union status groups, currently married women are the best educated up to age 35, after which they are about the same as currently visiting women, but still better educated than common law or single women (see table 7).

The proportion of urban residents does not follow any definite pattern by age/union status and the differentials vary greatly from age group to age group. For example among the under 20 age group, common law women are mostly urban, and remain one of the most urban groups up to age 29, but are one of the least urban between ages 30–44.

The partners of initially married women are also better educated than partners of women starting in visiting or common law unions, and this is true of the current union status groups within age groups, although for the totals it appears as if partners of women in visiting unions are better educated, because of their younger age distribution. Initially married women also have partners in higher occupations, but among the current union status groups, married and visiting have about the same occupational distribution of partners.

5.2 UNION STATUS DIFFERENTIALS IN DATE REPORTING

Differentials in date reporting for the various union types must be examined, because they would be relevant to any study of union differentials within other demographic factors. Since nuptiality is a process, it must be measured

Table 7 Per Cent of Women with Secondary Education, by Current Age and Current Union Status

Current age	Per cent with secondary education			
	Married	Common law	Visiting	Not currently in a union
15–19	*	29	50	58
20–24	59	16	42	23
25–29	49	7	34	16
30–34	27	3	(18)	14
35–39	17	3	(20)	9
40–44	12	0	(13)	16
45–49	14	3	(9)	6

*Cell has < 20; brackets round figures indicate cell has < 50.
Source: JFS, 1975–76

by a history, and not by any one state; however, it is difficult to obtain any one index of the union history with which date reporting can be compared. Initial union type by itself or in combination with later union changes is not a particularly good measure, because most women start out in a visiting union, and the variable itself has little variation. The progression from one union type to another is generally limited to a few common patterns, however, from visiting to married or common law, from common law to married or remaining common law, and the small initially married group generally remaining married, or from any type into the single state. These relatively few common types of union history are essentially reflected in the current union status with two small exceptions: the currently married group combines the small initially married group with the majority who enter marriage with a later union; and the currently visiting group, while it is heavily characterized by young women in their initial unions, does have a small proportion of older women who have reverted to or stayed in the visiting state. In addition, the use of current union status has the advantage of being frequently used in studying demographic differentials. Type of current union will therefore be used as our indicator of the union history, and will be examined for differentials in date reporting.

Clearly this is one among many possible indicators of union history, and since all cannot be covered here, the analysis of date reporting differentials by current union status will be used simply to alert data users to differentials which may exist in other union status variables. The single year age distribution of the four current union status groups is shown in figure 2. The first striking point made by this graph is that current union status groups have very different age distributions (see also table 8). None of the usual summary indexes of digit preference are appropriate for comparing union groups because their age distributions are so dissimilar. Consequently at best we can only examine the graph visually. The curves are somewhat irregular for all groups, but the married and common law groups have larger oscillations than the visiting group, especially above age 30, even though the visiting group has a smaller number of women at these ages, and would have larger sampling variation than other union groups. The age distributions are summarized in table 8, indicating that the average age of the four union status groups is quite different. Visiting union women are much younger on the average than the other groups, with common law women and women not currently in union falling in the middle, and married women being the oldest group. This leads us to expect visiting women to be the most accurate in reporting,

Table 8 Per Cent Distribution of Women by Current Union Status and Current Age

Current age	Current union status			
	Married	Common law	Visiting	Not currently in a union
15–19	1	13	36	14
20–24	11	24	31	18
25–29	16	22	12	17
30–34	17	15	8	11
35–39	19	12	6	11
40–44	20	9	5	14
45–49	15	6	3	14
Total	100	100	100	100
N	885	799	608	473
Median age (years)	36.3	28.0	22.3	30.5

Source: JFS, 1975–76

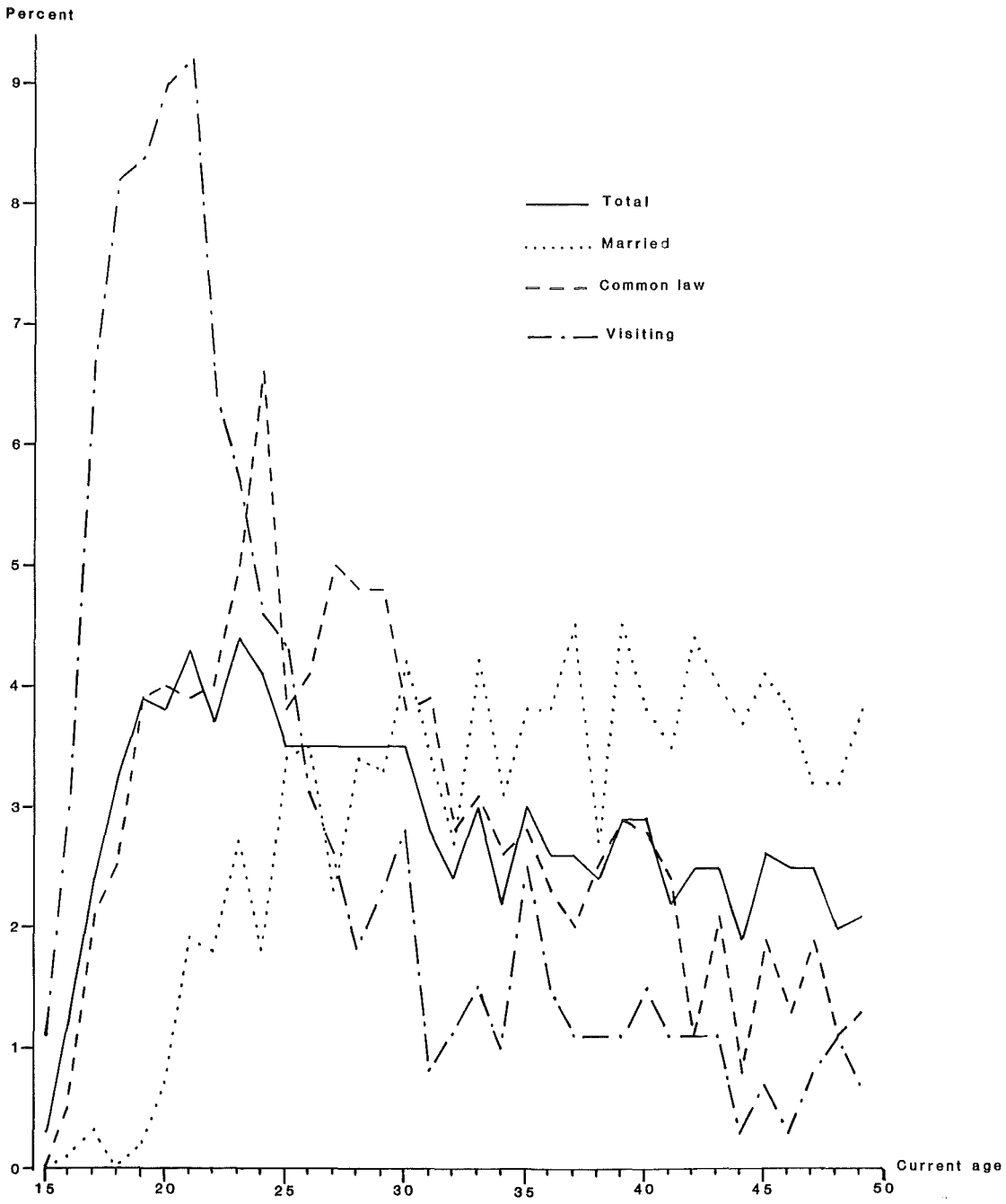

Figure 2 Distribution of All Women and of Each Current Union Group by Single Years of Age

followed by common law women and women not currently in union, and finally with married women being the least accurate. Using completeness of dating as a means of quality, we find that this is not entirely true, however:

Current union status	Per cent reporting date as age	
	Date of own birth	Date of first union
Visiting	3	40
Common law	8	52
Married	6	46
Not currently in union ('single')	7	52

As expected, visiting women had the most complete date reporting, as a result of their younger age; however married women proved to have somewhat more complete reporting than either common law or single women; only 46 per cent gave age, as compared to 52 per cent of the other two groups. This unexpected finding probably results from one of the few situations where complete dating is not equal to correct dating. As will be shown later in the paper, there is evidence to suggest that older women (and married women are the oldest group) tend to omit their earliest, unstable unions, giving their second union as the first. This second union is likely to be a married union, and the date is probably accurate, but it may often not be the date of the first union.

Table 9 Per Cent Distribution of Women by Age at Entry into the First Union according to Reporting of Date of Beginning the First Union by Five-Year Age Groups

(Type of date reporting: date = month and year; age = age at entry)

Age at entry	15–19		20–24		25–29		30–34		35–39		40–44		45–49	
	Date	Age	Date	Age	Date	Age	Date	Age	Date	Age	Date	Age	Date	Age
9	0.0	0.0	0.0	0.4	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.9	1.2	0.0	0.0	0.4	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
11	1.4	0.0	0.0	0.4	1.5	0.0	0.0	0.5	0.0	0.0	2.0	1.1	0.0	0.0
12	1.4	7.0	0.9	2.2	0.4	2.7	0.0	1.0	1.7	2.1	1.4	1.1	0.7	0.5
13	11.5	7.0	3.2	4.4	6.4	4.5	3.3	3.0	1.7	4.1	0.7	1.6	1.5	1.6
14	17.4	29.1	9.4	9.7	5.3	7.7	6.5	5.0	8.5	4.6	4.1	1.6	2.2	4.3
15	25.7	22.1	15.6	20.4	12.9	13.1	7.1	12.4	7.9	9.3	4.7	6.5	5.9	7.4
16	19.3	20.9	16.5	16.4	9.8	19.5	15.2	20.9	6.8	15.5	4.7	16.2	10.3	10.1
17	14.7	10.5	18.9	17.7	11.4	13.1	15.8	19.9	11.9	13.4	9.5	9.7	11.8	7.4
18	6.4	2.3	12.1	11.1	6.1	13.6	12.5	8.5	6.8	15.5	13.5	12.4	4.4	10.1
19	0.9	0.0	9.4	7.1	9.5	8.1	10.3	8.0	9.6	8.8	10.8	11.4	8.8	10.1
20			7.1	7.1	9.5	7.7	4.9	10.4	11.3	7.2	7.4	12.4	6.6	11.2
21			3.2	2.1	9.1	2.7	5.4	2.0	3.4	6.2	8.1	4.9	6.6	12.2
22			2.1	0.4	5.3	2.3	3.3	1.5	10.2	4.6	4.7	4.3	10.3	6.4
23			0.9	0.4	4.9	2.7	4.3	1.0	5.1	2.1	3.4	4.3	7.4	4.3
24			0.6	0.0	2.3	0.9	4.9	2.0	2.3	3.1	4.7	3.8	0.7	2.1
25					3.8	0.9	0.5	1.0	1.1	0.0	7.4	1.1	2.2	2.7
26					0.8	0.5	1.6	0.5	3.4	1.0	3.4	2.2	2.9	2.7
27							0.0	0.0	1.1	0.0	1.4	1.6	4.4	1.1
28							2.2	1.0	1.7	1.0	1.4	1.6	2.2	0.0
29							1.6	0.5	1.1	0.5	1.4	1.1	0.0	0.5
30							0.0	0.5	1.7	0.5	1.4	0.0	1.5	1.6
31							0.0	0.0	1.1	0.5	1.4	0.0	0.7	0.5
32							0.5	0.0	0.6	0.0	0.7	0.0	2.9	1.6
33							0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.5
34							0.0	0.0	0.6	0.0	0.7	0.0	0.0	0.5
35									0.0	0.0	0.0	0.0	1.5	0.0
36									0.0	0.0	0.0	0.5	0.7	0.0
37									0.0	0.0	0.0	0.0	0.7	0.0
38									0.6	0.0	0.7	0.5	0.7	0.5
39										0.0	0.0	0.0	0.0	0.0
40											0.0	0.0	0.0	0.0
41											0.0	0.0	0.0	0.0
42											0.7	0.0	0.0	0.0
43											0.7	0.0	0.0	0.0
N	218	86	339	226	264	221	184	201	177	194	148	185	136	188

Source: JFS, 1975–76

5.3 QUALITY OF REPORTING AGE AT ENTRY INTO FIRST UNION

As mentioned earlier, about half of all women ever in union reported their date of entering the first union, but the rest gave only their age at entry. The distribution of these two date-reporting groups by single years of age at entry into the first union does show some difference. Among all women, those who gave their age at entry have exaggerated peaks at ages 16 and 20, unlike the group who gave a calendar date at entry (see figure 3). Looking at these distributions by age-groups of women (table 9) we find that preference for ages 16 and 20 is not a societal norm, however, as evidenced by the fact that not all age groups of women show the same peaks. The two youngest groups show no preference for age 16, but from the 25–29 age group and onwards peaks at age 16, and occasionally at age 20, occur. It is also interesting to note that women who gave a date at entry, rather than age, had on the whole an older average age at entry. To some extent this may be expected, since women who gave dates were more educated and therefore tended to begin their first union at an older age. But also within levels of education, women who gave dates had slightly older ages at entry, suggesting that women who gave dates tended to overstate their age at entry or that women who gave age tended to understate (see tables 10 and 11).

Table 10 Per Cent Distribution of Women according to Reporting of Date of Beginning the First Union by Level of Education

Level of education	Type of date reporting	
	Month and year	Age at entry
Primary years < 6	40	60
Primary years 6–8	50	50
Secondary or higher	69	31
Total	53 (1465)	47 (1300)

Source: JFS, 1975–76

Table 11 Per Cent Distribution of Women by Age at Entry into the First Union by Level of Education and by Reporting of the Date of the First Union

(Type of date reporting: date = month and year; age = age at entry)

Age at entry into first union	Level of education					
	Primary < 6 yrs		Primary 6–8 yrs		Secondary +	
	Date	Age	Date	Age	Date	Age
< 20	66.9	67.3	75.1	77.7	65.0	76.0
20–24	20.0	26.6	18.2	18.2	28.3	20.9
25+	13.1	6.1	6.7	4.1	6.7	3.1
Total	100.0	100.0	100.0	100.0	100.0	100.0
N	(154)	(229)	(883)	(876)	(428)	(196)

Source: JFS, 1975–76

5.4 TRENDS IN AGE AT ENTRY INTO FIRST UNION

A first, though slightly biased, indication of the observed trend in the age at entry may be obtained by looking only at women aged 25 and over who had entered a union before age 25. We find a decrease of 1.2 years in the mean age at first entry, from 18.6 years for the 45–49 group, to 17.7 years for the 25–29 group. The trend was further verified by calculating the median and mean ages at entry for cohorts, without the truncations at age 25. This was done by two methods – the first was to simply obtain the median age from the actual data (estimate (a), table 12) and the second was to fit the data to the Coale-McNeil model (Coale 1971, Coale and McNeil 1972, Rodríguez and Trussell 1980). Considering the possibility of errors in dating the first union, we obtained a third estimate by fitting the Coale-McNeil model to the age at first birth (Casterline and Trussell 1980). The distribution of women by age at entry for five-year cohorts is shown in table 12 and the three estimates of the median or mean age at entry are included in the lower panel of table 12.

The distribution shows what seems to be a trend towards earlier age at entry, from age 45–49 to 20–24. For example, whereas only about 50 per cent of 45–49 year olds had entered their first union before age 20, 76 per cent of 20–24 year olds had done so. The summary measures of median and mean reflect this trend. Both the median and the mean age at entry into the first union show declines of about 2.5 years from the oldest to the youngest cohort. The mean age at first birth shows a slightly smaller decline, of about two years, and the median age at first birth an even smaller decline of about 1.5 years. It is important to note that regardless of which measure is used, the trend is not a regular one: the greater part of the decline occurs abruptly from the 45–49 group to the 35–39 group, with the estimates for younger groups aged 20–34 oscillating around similar levels.

The fact that most of the decline occurred from the oldest age group to the 35–39 age group raises the possibility that omission of early visiting unions or displacement of the date of first union by older women artificially inflated their average age at entry. The first hypothesis is supported by the argument that women may be unsure whether to report a sexual relationship as a visiting union, especially if the relationship was brief in duration, regardless of whether it resulted in a birth. This may be so especially since the interviewer would have defined a visiting union as a 'steady' sexual relationship. About four-fifths of all women have visiting unions as their first relationship, but omission of early casual relationships is

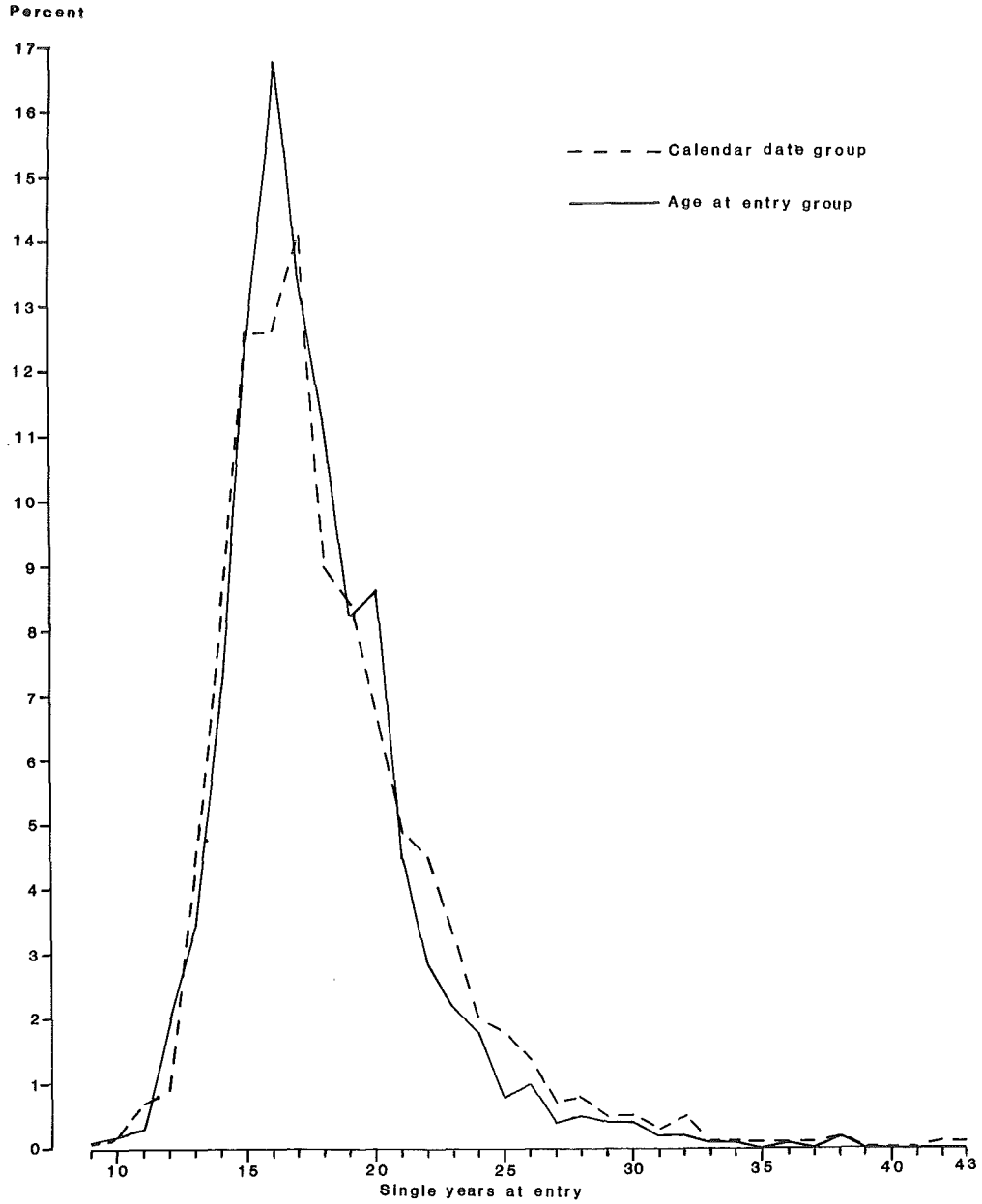

Figure 3 Per Cent Distribution of Women by Single Years at Entry into First Union for Two Groups – Women giving Calendar Year of Entry and Women giving Age at Entry

quite likely, especially among older women, for whom the relationship would have occurred some 20–30 years before, and who would most likely have had subsequent stable unions. This hypothesis is tested later in this section. There are few plausible arguments to support the second hypothesis, of displacement of the date of the first union, although it may have occurred. Since the effect of both errors is the same, it is difficult to determine their relative contribution to the observed trend of declining age at entry. The mean age at entry for residence and education subgroups is shown in table 12 in order to further check the consistency of the trend in the mean age at entry. Overall consistency is reasonable – means are lower for rural than urban areas and the mean age increases with rising education. A few important exceptions occur, however – the lowest educated group shows a much sharper decline between ages 45–49 and 30–34, a total change of 3 years, compared to the completed primary group which had a decline of 1.8 years, and the secondary group (ignoring the 45–49 group, which is discussed below) had a stable mean. The larger size of the decline among lower-educated groups does cast some doubt on their reporting. On the other hand, urban and rural women have roughly the same amount of change between ages 30–44, a decline of about 1.6 years, although we may have expected rural women to have worse reporting than urban women. The contrast between urban and rural areas is not very strong in Jamaica, however, and some homogeneity in demographic behaviour may be expected. On balance, therefore, the evidence of the subgroups is more in support of some error in reporting the age at entering the first union, an error that decreases with increasing education.

The unusually high mean age at entry for 45–49 year old secondary educated women (24.8 years) is not likely to

Table 12 Cumulative Proportions of Women who had Entered a Union, and Measures of Average Age at Entry for Women Aged 20–49 at the Date of Interview, from JFS (1975) Data

A Cumulative proportions

Ever in union by age	Cohort aged 20–24	25–29	30–34	35–39	40–44	45–49
15	12.4	13.8	9.8	11.2	6.5	5.5
20	76.1	69.8	73.8	62.7	56.8	47.6
25		92.7	93.2	89.0	85.2	81.7
30			97.4	94.5	95.6	91.2
35				96.9	97.6	96.3
40					98.5	98.2
45						98.5

B Median and mean age at entry into first union and first birth

Age at entry	Cohort aged 20–24	25–29	30–34	35–39	40–44	45–49
(a) Median age from survey data	17.5	17.9	17.7	18.6	19.6	20.3
(b) Mean age at entry (Coale-McNeil)[a]						
Total	18.2	19.1	18.7	19.4	20.4	20.9
Urban	18.7	19.5*	18.7	19.9	20.3	21.9
Rural	17.7	18.4	18.6	19.0	20.3	20.3
Inc. primary	18.0	17.4*	17.9	18.8	19.9	20.9*
Compl. primary	17.8	18.8	18.4	19.4	20.5	20.2
Secondary	18.7	21.9*	21.6	21.5	21.7	24.8
(c) Mean age at first birth (Coale-McNeil)	19.5	20.4	19.8	20.3	21.4	21.7
(d) Median age at first birth	19.1	19.2	18.8	19.3	20.7	20.8

[a]All estimates are derived from maximum likelihood fitting except those marked with an asterisk, which are least squares estimates.
Source: JFS, 1975–76

be a real phenomenon – there are only about 30 women in this group, and this may be random variation; alternatively it is possible that heaping at age 50 in the household interview, causing some women in their late 40s to be excluded from the individual interview, may have disproportionately affected this subgroup. This high mean age is directly reflected in the high mean age for urban women aged 45–49, since the majority of secondary educated women would reside in urban areas.

The similarity in the trend of the age at first birth and the age at first union does to some extent support the reliability of both changes. Nevertheless it remains a possibility that either both early unions and early births were omitted, or both were mis-dated. Variations in the difference between the two means, which are approximately equal to first birth intervals, suggest that errors did occur. The largest interval, 1.4 years, occurred among the 25–29 age groups, and there are small declines to intervals of 0.9–1.1 years among women aged 30–44, with an even shorter interval of 0.7 year occurring among the 45–49 age group. The 20–24 group also had an unexpectedly short interval of 1.1 years. These intervals are shorter than the averages of most countries, suggesting that errors in dating occurred at all ages, but increasingly so as age increased, with the 45–49 group showing the highest level of error. The effect of this differential error on the decline in the age at entry is to exaggerate the decline by perhaps 0.5–0.7 year, while all the mean ages at entry may in addition be overstated by about 0.3–0.6 year, if the Guyanese intervals of 20–24 months are taken as an approximation to the real levels in Jamaica.

Comparison of the survey's trend in age at entry with external evidence would be a good test of its validity. Because of differences in definitions, however, none of the last three censuses have a group equivalent to 'never-in-a-union', which is necessary to calculate a singulate mean age at entry. Although the 1960 and 1970 censuses do have a group called 'never lived with husband or common law partner', this group includes not only women who have never been in a union, but also women who have been in a previous visiting union, and who have not had a child in the last year.

It is possible to make a few indirect checks against external data, however. First, since the two 'stable' union types, married and common law, have the same definitions in the census and the survey, a comparable mean age at

entry into stable unions may be calculated for both sources. The means at entering stable unions were:

1960 census	1970 census	1975 JFS
22.0	22.6	22.3

and the proportions in stable unions were more or less similar below age 30, but had increased somewhat above age 30, from 1960–1975. The similarity in means and proportions suggests that there has been little change in this type of union formation in the 15 years before the survey. By implication, therefore, any change in the overall mean age at entering unions must come from increasing participation in visiting unions at young ages.

Secondly, survey data on union status may be verified against external census data. The distribution of all women by union status in 1960 and 1970 is shown for both sources, census and survey, in table 13. The 1975 survey population was reversed to 1970 and 1960, using census definitions to obtain comparable categories. The results show that the two sources give almost identical distributions within each age group. The one difference that shows up is a lower proportion who are reported 'separated' (ie formerly in a married or common law union) in the survey than in the census, especially among women aged 25–29 and 30–34 in 1960, who are the 40–44 and 45–49 year-olds in 1975, the survey year. The 'separated' group includes only women who had been in a common law or married union before, but not those only in visiting unions. The superficial explanation for this discrepancy between the two sources is that in the JFS women omitted early common law or married unions. This seems very unlikely, however, and a more plausible explanation may be that too many women who had only ever been in visiting unions were reported as having had a common law or married union.

Comparison further backwards, with the 1943 census, showed that the married and common law groups, the only ones that could be compared, were approximately the same in the census and the survey. It is not possible to check the frequency of visiting unions either in 1960 or 1943, however, since the censuses did not collect data on this union type.

These comparisons suggest that the survey was quite accurate in obtaining participation in married and common law unions throughout women's lifetimes. We do not know whether reporting of visiting unions was equally complete for early periods, however, because no external check is possible.

It is interesting to note the large differences in proportions in visiting unions obtained through the survey's wider definition, as compared with the 1970 census. The census classified women as visiting only if they had had a child during the past year and were not in a common law or married union at the time of the census. However, the JFS asked women directly if they were in or had been in a visiting union and the result was that a much higher proportion of women were classified as visiting, and proportionately smaller proportions were never in union as compared with the census. The JFS also had higher proportions 'single', ie ever in union, but not currently in union, than the census, since women surveyed in the JFS gave information on

Table 13 Reconstruction of Union Status Distribution (in Per Cent) for Five-Year Age Groups for Census Dates 1960 and 1970, from the Union History of the JFS

A 1960 census

	15–19		20–24		25–29		30–34	
	JFS	Census	JFS	Census	JFS	Census	JFS	Census
Never lived with partner	90	89	53	53	36	31	28	22
Married	2	1	16	11	28	25	35	36
Common law	7	8	28	29	32	34	32	30
Visiting[a]	–	–	–	–	–	–	–	–
Separated[b]	1	2	3	7	4	10	5	12

B 1970 census

	15–19		20–24		25–29		30–34		35–39		40–44	
	JFS	Census	JFS	Census	JFS	Census	JFS	Census	JFS	Census	JFS	Census
Never lived with partner	76	75	48	43	23	24	16	17	11	13	14	12
Married	2	1	12	11	30	26	42	39	47	48	49	51
Common law	10	10	27	29	35	36	32	32	27	27	20	21
Visiting[c]	10	12	10	12	6	7	4	4	3	2	1	1
Separated[b]	1	2	3	5	5	7	7	9	12	10	16	14

[a] The visiting group was not identified in the 1960 census.

[b] This group includes women who have lived with either a married or common law partner before, but who were currently separated. Separated visiting women are not identified in the census, and are included in the group 'Never lived with partner'.

[c] The definition of visiting used in censuses is that the woman was not in a common law or married union at the date of enumeration, but she had borne a child within the year before the census.

Table 14 Trends in Sex Ratios from 1943–70 for the Reproductive Age Groups of Females (15–49) and Males (20–54)

Men	Women	Census year		
		1943	1960	1970
20–24	15–19	875	744	700
24–29	20–24	802	730	729
30–34	25–29	806	698	724
35–39	30–34	822	807	877
40–44	35–39	846	808	855
45–49	40–44	713	932	819
50–54	45–49	774	842	901
20–54	15–49	813	781	781

Source: Population census, 1943, 1960, 1970

earlier visiting unions, and not only on the current visiting union. The results argue that the JFS succeeded in obtaining more accurate information on women's participation in visiting unions.

The pattern of decline in the mean age of beginning unions observed among the age groups implies that social changes sufficient to cause such a large decline in the age at beginning unions took place from the mid-1940s to the 1950s, but that from 1960 onwards very little happened. Given that most of the increase in secondary education occurred after 1960, and that more males than females emigrated in the 1940s and 1950s (judging from declines in the sex ratio at the central reproductive ages, from 1943–1960 (table 14)), it seems very unlikely that a decline of around two years in the age at entering unions could have occurred from the 1940s to 1950s. The abruptness of the decline, occurring almost wholly from the age group 45–49 to the 35–39 group, and the relative lack of change for cohorts aged 35–39 and younger (by implication during the period after 1960), also throws further doubt on the reality of the observed trend.

There are various reasons why a decline in the average age of entry may be expected. One argument that has been put forward is that, within the context of the West Indian family system where a visiting union is a real option, increasing attendance of the 15–19 age group at secondary school would break down the authoritarian family controls exerted over the sexual behaviour of young women. Blake (1961), surveying a small sample of lower-class men and women in Jamaica, describes these mechanisms of control as being limited mainly to restraint and confinement. Even at that time, twenty years before the JFS, however, this type of control was not very effective in preventing teenagers from entering unions: the median age of entry for the women in her sample was 17 years. The ineffectiveness of attempts to control adolescents was due to other factors – such as poverty and broken homes, the desire to benefit from employment of older children, parental ambitions for children and the practice of sending children to live with other relatives (Blake 1961: 93). Although parental control was not very effective traditionally, it is possible that increasing secondary school attendance may have further reduced the effectiveness of parental supervision, a hypothesis which is supported by the finding of the Blake and Stycos surveys that school attendance increased the opportunities for girls to meet potential partners. At the same time knowledge of efficient contraceptive methods became widespread, and the combination of the two factors could have resulted in younger age groups entering unions at somewhat lower ages. West Indian researchers have also observed that while 15–20 years ago visiting unions existed mainly among the lower class, this is no longer true, and an increasing proportion of young 'liberated' middle-class girls are entering visiting unions.

All of these expected changes hinge on increasing attendance of teenage girls at secondary schools. If the observed trends are to be explained by these factors, however, education should have risen significantly from 1940–60, and remained more or less at the 1960 level thereafter. Yet the greater increases in secondary school attendance occurred after 1960, rather than during the 1940–60 period, suggesting that rising education cannot explain the trends in age at entry observed in the JFS survey.

Moreover, a strong argument can even be made in the reverse direction, on the basis of the relationship generally observed in other countries, that increasing education leads to a rising age at first marriage. There is no hard evidence to prove that the Jamaican case should show the reverse relationship. In this regard it is worth mentioning that there was almost no change in the average age at entering the first union among Guyana Non-Indians, who have a similar union system, a similar culture and who have experienced similar rises in secondary education.

5.5 INTERNAL CHECKS ON THE QUALITY OF UNION HISTORY DATA

Since the evidence to support the observed pattern of decline in the age at beginning the first union is insufficient, the trend will be evaluated more closely by examining the internal consistency of the data. Overstatement of the age

at entry will be tested by the following measures – the length of the first birth interval, the mean number of children born by given union durations, the distribution by initial type of union, the distribution by union status over time, the mean number of partners and relationships by cohorts, and the frequency of out-of-union births. Dating of unions other than the first will also be partially evaluated by the rate of out-of-unions births.

Length of the First Birth Interval

Groups which either overstated their age at entry or omitted their first union are expected to have a shorter mean first birth interval, since raising the date of first entry would move it closer to, or place it later than the date of the first birth. Summary measures of the length of the first birth interval were obtained by applying the life table approach (Smith 1980):

Age group	First quartile	Median quartile	Third quartile	Per cent who are mothers
15–19	10.2	19.9	47.6	.6337
20–24	8.7	17.2	36.9	.8245
25–29	5.7	14.2	31.1	.9381
30–34	4.8	12.1	26.3	.9661
35–39	3.7	11.9	26.7	.9731
40–44	3.3	12.4	30.7	.9581
45–49	2.0	12.0	26.8	.9589

The fact that a fairly high proportion of women in all age groups have first birth intervals that are shorter than the normal minimum of nine months implies that a substantial proportion, increasing with age of women, had either overstated their age at entering the first union, or had omitted the first union altogether. While some births may be conceived outside of any union, it is unlikely that casual relationships would account for such a high proportion of first births, and that this should increase by age groups of women: the study by Roberts (1975) found that the frequency of casual relationships was quite low.

More detailed information is presented in table 15, giving the per cent distribution of five-year age groups of women by age at entry into the first union, by length of the first birth interval, including the mean length. The mean length of this birth interval does steadily become shorter as age increases, although the age group 40–44 is an exception. The mean length drops from 15–16 months at ages 15–19 and 20–24, to 12.4 at age 35–39, rising slightly to 13.8 for age group 40–44, and finally steeply declining to 8.4 months for the 45–49 age group. To give a general perspective, these averages may be compared to averages in other countries, such as Thailand and Fiji, of about 16–22 months, and in Guyana of 20–25 months. The implication here is that the length of this first birth interval may be understated for all age groups in Jamaica, but more for the older age groups, and worst of all for the 45–49 age group, with its mean of 8.4 months.

The per cent distribution in table 15 shows that within all age groups, women who entered the first union at higher ages were more likely to have large negative intervals. The coincidence of these two factors strongly suggests that women who gave higher ages at entry had either overstated their age at entry or omitted their first union. Since a higher proportion of older women entered their first union at high ages, their average age at entry would also contain a larger upward bias than that of younger age groups. The evidence definitely points to some overstatement of age at first union, either directly, or indirectly by omitting the first union and supplying the date of a second, perhaps more stable union, as the first. This was true at least for women above age 25, but with overstatement increasing directly with age.

Children Ever Born by Duration

If overstatement of the date of the first union or omission of the first union caused unusually short birth intervals, it is likely that the second and further early births may also appear to occur too close to the date of the first union, for the same reasons. To test this the average number of births occurring 0–4, 5–9, 10–14 and 15–19 years after the date of the first union are presented for each five-year age group in table 16. It is interesting to note the very high number of children born in the first five years for women aged 30 and over, combined with very small increases during the next five-year period; and actual decreases from the 5–9 to the 10–14 duration group. For example it is highly unlikely that women currently aged 45–49, and who first entered a union 0–5 years ago, would have had an average of three children each in that period of time, when they would have been between the ages of 40 to 49, suggesting that the duration is incorrect. If the duration is too short then the supplied date of entry is too high. Although the numbers of cases in some of these groups are small, the existence of the pattern for all ages 30 and over suggests that it is not a spurious finding. Moreover, severe overstatement by a small number of women can significantly affect the mean age: for example if 20 women gave ages at entry that were on average 10 years too high, this would add one year to the mean of an age group that had 200 women. Some of these age groups have about 300 women, and incorrect ages may have been given by more than 20 women in a given age group, so the effect is by no means trivial.

Distribution by Type of Initial Union

Another way of testing the hypothesis that some age groups have overstated their age at first union is to see whether the proportions who began in visiting unions vary among age groups. The justification for this test is that most women began in visiting unions, and for this reason alone, if early unions are omitted, most of them will be visiting unions. In addition, given that both common law and married unions last longer and at least marriage carries a higher social status ranking, these types are less likely to be omitted as initial unions. Table 17 shows that the proportion of younger women who begin a visiting union is higher than the equivalent proportion for older women. A comparison of the age groups can be made if we assume that all women who have never entered a union will begin in either a common law or married union, and construct a hypothetical distribution of proportions by initial union (columns 5 and 6 of table 17).

Even under this extreme assumption, age groups 20–24 and 25–29 have 78–79 per cent beginning in a visiting union, compared to 71 per cent for age groups above 35. In the light of the earlier discussion about the declining sex ratio probably causing some increase in the frequency of visiting unions between cohabiting males and single females, it is likely that some of this increase in the per cent of women beginning with visiting unions is real. It is also probably true that some of this increase is apparent, however. The alternative explanation that some older women omitted their first union, which was visiting, and gave the date of a subsequent, more stable union as the initial one, would probably account for some of the apparent increase in the tendency to begin in a visiting union.

Distribution by Union Status Over Time

A separate study on the union system and fertility showed some unusual findings, presented here in table 18 (Singh and Lightbourne 1981). These proportions are based on the

Table 15 Per Cent Distribution of Women by the Length of the First Birth Interval, by Current Age and by Age at Entry into the First Union

Age/age at entry	Negative intervals (months)				Positive intervals (months)									
	<49	25–48	13–24	0–12	1–7	8–12	13–18	19–24	24–36	37–48	49–60	61+	Mean	N
15–19 total	0.5	3.1	1.6	6.8	8.3	28.6	17.2	11.5	9.4	7.8	3.6	1.6	15.1	192
15	0.0	0.0	0.0	1.4	5.6	22.5	14.1	11.3	14.1	16.9	9.9	4.2		71
15–19	0.8	5.0	2.5	9.9	9.9	32.2	19.0	11.6	6.6	2.5	0.0	0.0		121
20–24 total	0.9	2.6	2.4	9.3	10.6	21.0	14.3	14.1	11.1	5.9	3.5	4.3	16.1	461
15	0.0	0.0	0.0	2.5	7.6	19.0	10.1	10.1	17.5	10.1	10.1	12.7		79
15–19	0.3	2.4	2.7	10.3	10.6	21.8	15.6	14.7	10.6	5.6	2.4	2.9		339
20–24	7.0	9.3	4.7	14.0	16.3	18.6	11.6	16.3	2.3	0.0	0.0	0.0		43
25–29 total	3.6	3.3	4.5	8.5	10.0	18.1	14.1	9.8	12.9	5.8	2.9	6.5	14.7	448
15	0.0	0.0	1.4	2.8	8.5	11.3	16.9	12.7	23.9	7.0	1.4	14.1		71
15–19	1.9	3.0	5.2	11.6	10.9	18.7	13.1	9.4	9.7	6.4	3.4	6.7		267
20–24	7.1	7.1	4.0	5.1	10.1	21.2	13.1	9.1	15.2	4.0	3.0	1.0		99
25–29	36.4	0.0	9.1	0.0	0.0	18.2	27.3	9.1	0.0	0.0	0.0	0.0		11
30–34 total	4.1	3.0	3.0	10.7	13.5	20.1	12.4	7.7	12.1	4.7	2.5	6.3	13.0	364
15	0.0	0.0	0.0	13.2	5.3	28.9	5.3	7.9	15.8	7.9	5.3	10.5		38
15–19	1.2	2.5	4.1	11.6	15.3	18.2	14.0	7.9	13.2	4.5	2.5	5.0		242
20–24	7.6	7.6	1.5	7.6	12.1	24.2	10.6	6.1	7.6	3.0	1.5	10.6		66
25–29	41.2	0.0	0.0	0.0	11.8	11.8	11.8	11.8	5.9	5.9	0.0	0.0		17
30+	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		1
35–39 total	8.2	3.1	4.2	7.3	10.5	19.2	9.3	9.6	11.0	5.6	4.2	7.6	12.4	354
15	0.0	0.0	0.0	2.4	4.8	19.0	7.1	9.5	19.0	9.5	11.9	16.7		42
15–19	1.6	3.1	4.2	9.4	14.6	21.9	9.4	10.4	8.3	4.7	3.6	8.9		192
20–24	17.7	4.2	5.2	7.3	7.3	14.6	9.4	9.4	13.5	5.2	3.1	3.1		96
25–29	42.1	5.3	10.5	0.0	0.0	15.8	10.5	5.3	5.3	5.3	0.0	0.0		19
30+	20.0	0.0	0.0	0.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0	0.0		5
40–44 total	7.0	2.6	1.6	12.5	11.2	16.6	10.9	9.3	9.6	4.2	4.2	10.5	13.8	313
15	0.0	0.0	0.0	14.3	0.0	19.0	9.5	9.5	19.0	0.0	9.5	19.0		21
15–19	1.2	0.6	2.5	14.1	15.3	14.1	12.0	11.7	10.4	3.7	3.7	9.8		163
20–24	9.0	5.6	1.1	10.1	11.2	19.1	10.1	6.7	4.5	5.6	4.5	12.4		89
25–29	21.9	3.1	0.0	12.5	0.0	18.8	6.3	6.3	15.6	6.3	3.1	12.4		32
30+	62.5	12.5	0.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0		8
45–49 total	9.5	3.0	4.1	8.8	12.5	15.9	12.5	8.4	9.5	4.1	3.0	8.8	8.4	296
15	0.0	0.0	11.8	11.8	5.9	11.8	23.5	5.9	0.0	11.8	5.9	11.8		17
15–19	0.0	0.8	3.0	9.0	17.3	23.3	12.0	10.5	11.3	0.8	3.0	9.0		133
20–24	9.1	5.1	5.1	11.1	10.1	9.1	14.1	7.0	8.1	7.1	4.0	10.1		99
25–29	26.9	7.7	3.8	3.8	11.5	7.7	7.7	3.8	11.5	7.7	0.0	7.7		26
30+	57.1	4.8	0.0	0.0	0.0	14.3	4.8	9.5	9.5	0.0	0.0	0.0		21

Source: JFS, 1975–76

Table 16 Mean Number of Children Ever Born by Current Age for Duration Groups < 5 to 15–19

Current age	Years of union duration			
	< 5	5–9	10–14	15–19
< 20	0.8 (277)	1.7 (26)		
20–24	1.3 (309)	2.4 (248)	3.3 (6)	
25–29	1.5 (93)	2.8 (244)	4.0 (134)	5.2 (11)
30–34	2.6 (35)	3.1 (81)	4.2 (180)	5.6 (84)
35–39	2.7 (17)	3.1 (38)	5.0 (93)	5.4 (153)
40–44	2.2 (15)	4.3 (24)	4.0 (37)	5.0 (81)
45–49	3.0 (13)	3.6 (20)	3.4 (27)	4.9 (47)

NOTE: Figures in brackets indicate the number of women.
Source: JFS, 1975–76

Table 17 Per Cent Distribution of Women by Type of Initial Union

Age group	Type of initial union			Per cent never in a union	Hypothetical redistribution[a]	
	Married	Common law	Visiting		Married and common law	Visiting
20–24	2.7	8.3	89.0	12.3	22	78
25–29	7.4	10.3	82.3	4.2	21	79
30–34	9.1	15.6	75.3	1.3	26	74
35–39	10.0	17.0	73.0	3.1	29	71
40–44	8.1	20.1	71.8	1.2	29	71
45–49	8.6	19.8	71.6	1.5	29	71

[a]Assuming that all women currently never in a union would enter either married or common law unions.
Source: JFS, 1975–76

number of years spent in each type of union, at the given age in the given period. The results show that participation in unions has risen in general at ages 15–34, with the largest increases occurring from 1946 to the early 1960s. Moreover, much of this rise in participation is due to more women entering married and common law unions, although some rise in visiting unions, especially at age 15–19, did also take place. The rise in participation in visiting unions at the teenage years is especially relevant to the observed decline in the average age of beginning unions. The proportion of visiting unions at age 15–19 was 13 per cent in 1946–50, but rose to 21 per cent by 1960, and rose further to 26.5 per cent in 1966–75. This may have been the true situation, but other explanations are also likely. It is possible, for example, that there has been a change in willingness to report visiting unions or a change in the subjective definition of such unions. It is even conceivable that older women who had brief visiting unions in their teenage years may consider that the interviewer is not interested in these, but in their more long-lasting, established unions. All of these arguments imply the omission of early visiting unions of older women.

While plausible arguments can be made for the omission of visiting unions and even possibly common law unions, which would have a lower social ranking than legal marriage, it is more difficult to explain the increase in proportions legally married at ages 20–34. Most of this increase occurred from the group aged 45–49 at the survey to those aged 35–39. It is unlikely that older women would have omitted or post-dated legal marriages: an increasing tendency to earlier legal marriage or cohabitation does seem to have occurred, affecting current age groups 45–49 to about 30–34, and stabilizing for younger age groups.

Partners and Relationships by Cohorts of Women

A good test of omission of early relationships or partners is to examine the average number of relationships or partners achieved by given ages, for five-year cohorts of women (table 19). These two measures show roughly the same result – that from age 30–34 to age 45–49, no increase in the total average number of events occurred, even though the 45–49 group had about 15–19 years more exposure to changing their partners or relationships. On the contrary there is even a slight increase in the mean number of partners from age 45–49 to age 30–34.

Examination of the rate of cumulation by age shows that at ages 15–24 there is a steady and substantial increase, from old to young cohorts, in the mean number of partners and relationships. In contrast, the incremental average above age 25 shows little or no change. Thus the stabilization of the overall mean among the cohorts simply reflects the balancing out of a lower rate of change at younger ages against more years of exposure for older cohorts. The size of the increase (at age 15–19 an increase of roughly 100 per cent, from cohort 45–49 to cohort 20–24, and at age 20–24, an increase of 20–30 per cent from the 45–49 cohort to the 25–29 cohort) is so great that it is difficult to accept it as a real phenomenon. The fact that the apparent change is concentrated at the youngest ages increases the

Table 18 Per Cent Distribution by Union Status over Different Time Periods, and Summary Indices of Proportions in Different Union Types

	Married (1)	Common law (2)	Visiting (3)	Not in union (4)	Total (5)
15–19					
1971–75	1.6	8.7	26.5	63.2	100.0
1966–70	1.5	9.5	26.4	62.5	100.0
1961–65	2.1	10.7	22.7	64.5	100.0
1956–60	1.9	8.4	20.8	68.9	100.0
1951–55	1.7	10.3	17.9	70.1	100.0
1946–50	1.3	7.8	12.9	77.9	100.0
20–24					
1971–75	13.3	29.2	30.3	27.2	100.0
1966–70	14.0	27.5	29.3	29.2	100.0
1961–65	14.4	25.8	26.2	33.7	100.0
1956–60	13.3	25.9	25.9	34.9	100.0
1951–55	11.9	22.5	24.7	40.8	100.0
1946–50	9.8	19.0	24.1	47.1	100.0
25–29					
1971–75	29.1	35.0	19.0	17.0	100.0
1966–70	31.5	32.3	16.3	19.9	100.0
1961–65	31.0	32.4	16.7	19.9	100.0
1956–60	28.7	30.1	18.2	23.0	100.0
1951–55	22.8	27.7	20.6	28.8	100.0
30–34					
1971–75	40.0	32.1	12.6	15.4	100.0
1966–70	39.4	31.3	12.1	17.1	100.0
1961–65	41.1	29.5	12.5	16.8	100.0
1956–60	34.2	30.8	13.8	21.2	100.0
35–39					
1971–75	46.5	26.9	9.8	16.9	100.0
1966–70	48.4	25.3	9.3	17.0	100.0
1961–65	44.3	26.3	11.5	17.9	100.0
40–44					
1971–75	51.4	20.6	7.4	20.6	100.0
1966–70	48.0	20.4	11.0	20.6	100.0
45–49					
1971–75	47.3	17.1	8.2	27.5	100.0

Source: Singh and Lightbourne (1981)

likelihood that some of it is due to omission of partners and relationships by older women. Moreover, the fact that union change is roughly stable at ages 25 and higher makes it even more difficult to accept an increase occurring only at ages 15–24.

Occurrence of Births Outside of Relationships

Discussion of the length of the first birth interval and of duration-specific parities implied that some births had occurred before the date given as the date of first union. A more complete count of fertile conceptions which occurred outside of any relationship was made, considering births in the first six months of a union as extra-union conceptions but births in the ten months after the end of a union as intra-union conceptions. These out-of-union births were distributed by the order of the live birth and by the order of the relationship (see table 20). The results show that most out-of-union births are first births, occurring before the first union. In addition, however, these distributions

Table 19 Mean Number of Relationships and Partners for Five-Year Cohorts of Women, by Five-Year Age Groups

A Relationships[a]

Current age	Cumulated mean number of relationships at age							Total mean
	15–19	20–24	25–29	30–34	35–39	40–44	45–49	
15–19	[0.46][b]							0.46
20–24	1.16	[1.83]						1.83
25–29	0.96	1.93	[2.33]					2.33
30–34	1.00	1.87	2.43	[2.65]				2.65
35–39	0.83	1.68	2.21	2.54	[2.71]			2.71
40–44	0.70	1.44	2.03	2.37	2.64	[2.78]		2.78
45–49	0.59	1.34	1.85	2.26	2.52	2.74	[2.81]	2.81

B Partners

Current age	Cumulated mean number of partners at age							Total mean
	15–19	20–24	25–29	30–34	35–39	40–44	45–49	
15–19	[0.39]							0.39
20–24	0.98	[1.45]						1.45
25–29	0.84	1.49	[1.75]					1.75
30–34	0.88	1.47	1.80	[1.92]				1.92
35–39	0.72	1.32	1.63	1.85	[1.94]			1.94
40–44	0.61	1.16	1.52	1.71	1.86	[1.95]		1.95
45–49	0.52	1.07	1.37	1.62	1.75	1.85	[1.90]	1.90

[a] A woman may have more than one relationship with the same partner by changing the type of union, eg from visiting to married.
[b] Means enclosed in square brackets indicate that experience at this age is incomplete.

Table 20 Percentage of Fertile Conceptions which Fall Outside of Union Periods, by Order of Birth and by Order of Relationship

Birth order		Relationship order	
Order of birth	Per cent occurring outside of union	Period between relationships by order	Number of births between relationships
1	37	0–1	989
2	17	1–2	284
3	11	2–3	131
4	8	3–4	44
5	7	4–5	19
6	6	5–6	3
7	5	6–7	0
8	5	7–8	0
9	4		
10	3		
11	2		
12	1		
Total births = 9177	16		1470

Source: JFS, 1975–76

show that a small proportion of second and third order births occur outside of unions, and small proportions of higher order births also. The implication here is that although dating of the first unions was worst affected (the point under consideration), in addition, coverage of later unions in terms of accuracy of dating and completeness of obtaining all unions apparently also contained some errors. Table 21 shows the percentage of births that occurred outside any of the three recorded types of union, at given ages within five-year periods. These data show a significant decline in the frequency of births occurring outside of unions at ages 15–29 from the late 1940s to the 1971–5 period. The implication is that older women have omitted more relationships/partners at young ages than younger women. Some of the problem may be in the subjective definitions of a relationship – it is possible that a brief or

Table 21 Percentage of Births occurring Outside of any Union, at Given Five-Year Age Groups, from 1946–50 to 1971–75

At age	1971–75	1966–70	1961–65	1956–60	1951–55	1946–50
15–19	20	25	31	33	32	37
20–24	11	13	19	19	16	18
25–29	8	9	11	12	13	
30–34	6	8	7	5		
35–39	6	6	2			
40–44	6	7				
45–49	9					

casual relationship may not be recognized as a 'sexual relationship with a steady partner' (which is the way a visiting union is described in the questionnaire), even though it may have resulted in a birth. However, younger women may be more likely to report casual relationships as visiting unions, simply because they may be going on at the time of the interview, or they may have occurred more recently and the impression on the young woman's memory would be stronger. Clearly, there is a category of exposure to conception which the union history is not capturing, as evidenced in the continuing moderate level of out-of-union births even in the five-year period before the survey. This could well be a problem of the questionnaire itself – a design that obtained the father of each child, linking the birth and union histories, would eliminate much of the non-coverage of unions.

6 Evaluation of Fertility Data

In this section we will look at measures of fertility to evaluate survey results on the level and recent trends in fertility.

The reporting of the dates of children's births is a crucial factor in calculating accurate rates, and it is significant that in Jamaica these dates are more completely reported than dates of beginning of first union. The fact that an appreciable proportion of all births, but especially first births, occurred before the first union suggests that there was no strong tendency on the part of respondents to force children's birth dates to fit their date of first union. Of course marriage dates and birth dates were elicited in separate sections of the questionnaire, which increases the difficulty of any tendency to disguise extra-union births. On the other hand it has been shown in evaluation of other WFS surveys that the retrospective maternity histories are prone to errors of misdating and, less frequently, of omission. The data will therefore be analysed here to determine whether such errors of omission or displacement occurred. Both tests of the internal consistency of the fertility data and comparison with external sources of data, the census and vital statistics, will be carried out.

6.1 CUMULATIVE FERTILITY

Census data on the mean number of children ever born are available for 1960 and 1970 censuses, and may be compared with reconstructed estimates from the JFS for those years (see table 22).

The data on children ever born show an increase in fertility between 1960 and 1970, both from the survey and the census, and then a decline from 1970–76. The recent declines in cumulative fertility mainly affected the four younger age groups, as expected. The rise in cumulative fertility between 1960–70 implies that the level of fertility rose from the 1950s up to the early 1960s. The existence of such a rise in fertility is examined in the following section on current fertility.

Comparison of the two sources shows that for both censuses, the census underestimates achieved fertility, relative to the survey, for all age groups. The level of difference between the two sources varies by age groups, with the two estimates agreeing closely for the 25–29 age group in both years, while the 15–19 group had the largest relative differential. The discrepancy at ages 15–19 and 20–24 is very unusual, for it is usually assumed that census coverage of younger women is good. In conclusion, while this check shows that the survey achieved greater coverage of births than the censuses, it will not tell us whether coverage of the survey itself was complete. Further tests will therefore be necessary to see whether omission of births occurred.

6.2 RECENT TRENDS AND CURRENT LEVEL OF FERTILITY

Age-specific fertility rates were calculated for single years, and are shown in table 23 for the 1950–74 period. These rates were based directly on the sample population for age groups over 20, but the 15–19 group had to be adjusted for the exclusion of full-time school girls. Inflation ratios were obtained from the household data for single year age groups between 15 and 19.

Both sources show a substantial rise in fertility from the early 1950s to the early 1960s, although the size of the rise differs: the vital statistics rates show an increase of 34 per cent while the survey data show an increase of about 18 per cent, if the recorded JFS rates for ages 10–29 alone are used to compute the percentage (table 24). Computation of the survey's per cent change on the basis of ages 10–29 only could have underestimated the total fertility change if older groups had larger increases – this does not seem to be

Table 22 Mean Number of Children Ever Born by Age Group as of the 1960 and 1970 Census Dates, Reconstructed from the Fertility History in the JFS (1975–76), and as Reported in the Census

	1960				1970				1976
Age at given date	Census	JFS	Census/ JFS	JFS-census	Census	JFS	Census/ JFS	JFS-census	JFS
15–19	0.28	0.36	78%	0.08	0.28	0.38	74%	0.10	0.27
20–24	1.35	1.58	85%	0.23	1.51	1.68	90%	0.17	1.61
25–29	2.38	2.47	96%	0.09	2.95	2.98	99%	0.03	2.84
30–34	3.13	3.56	88%	0.43	4.00	4.43	90%	0.43	4.11
35–39	3.64				4.63	4.96	93%	0.33	5.08
40–44	3.85				4.66	5.24	89%	0.58	5.40

Sources: Population census, 1960, 1970 and JFS, 1975–76

Table 23 Age-Specific Fertility Rates and Total Fertility Rates by Calendar Year, 1950–1974, from the JFS and for 1950–63, 1970, 1977 and 1978, from Vital Statistics and from the 1970 Census

Calendar year	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	TFR[b]
A Age-specific fertility rate from JFS (1975–76)[a]									
1950	24	100	231	–	–	–	–	–	–
1951	20	157	208	247	–	–	–	–	–
1952	3	110	272	291	–	–	–	–	–
1953	13	151	204	234	–	–	–	–	–
1954	16	151	253	261	–	–	–	–	–
1955	8	136	231	274	–	–	–	–	–
1956	12	145	231	299	–	–	–	–	–
1957	21	174	284	272	–	–	–	–	–
1958	9	161	297	296	272	–	–	–	–
1959	14	180	288	259	226	–	–	–	–
1960	24	185	285	304	264	–	–	–	6.6
1961	6	168	281	245	217	–	–	–	5.9
1962	20	184	305	276	266	–	–	–	6.6
1963	14	171	287	371	248	190	–	–	6.7
1964	7	184	273	297	265	191	–	–	6.5
1965	3	208	300	287	322	211	–	–	7.0
1966	9	185	322	275	206	164	–	–	6.2
1967	8	140	297	300	232	127	–	–	5.9
1968	8	171	278	268	217	207	44	–	6.0
1969	3	164	257	225	243	147	65	–	5.6
1970	7	209	266	271	211	137	56	–	5.8
1971	5	163	287	233	196	132	66	–	5.5
1972	8	172	273	272	214	124	54	22	5.7
1973	2	133	245	234	187	132	68	13	5.1
1974	12	132	253	213	172	92	55	0	4.6
B Age-specific fertility rates from vital statistics (1950–1963, 1970, 1977, 1978[c]) and census (1970)									
1950	1	102	224	189	140	99	35	6	4.0
1951	1	106	231	201	145	100	34	6	4.1
1952	1	103	249	203	147	96	37	7	4.2
1953	1	109	240	216	156	101	37	6	4.3
1954	1	118	252	228	161	100	40	5	4.5
1955	1	125	268	247	166	109	38	6	4.8
1956	1	132	274	253	176	114	40	7	5.0
1957	0	141	263	248	185	123	43	8	5.1
1958	1	142	281	265	196	124	43	8	5.3
1959	1	143	290	259	193	128	43	8	5.3
1960	1	153	307	272	210	135	50	8	5.7
1961	1	155	290	260	216	136	49	9	5.6
1962	2	148	293	264	220	140	47	8	5.6
1963	2	149	288	271	227	150	52	8	5.7
1970	2	119	244	215	155	129	45	7	4.6
1977	NA	107	213	184	128	76	29	4	3.7
1978	NA	123	196	180	112	75	26	4	3.6
1964–69, 1971–76	Not available from vital statistics								
1970 census[d]	NA	167	302	268	190	127	47	8	5.5

[a] JFS rates are for exact calendar years, and are therefore comparable with external sources.
[b] In computing TFRs for the survey, the empty cells are estimated by the average of the last three rates which are available for the corresponding age group.
[c] The recent data, for 1970, 1977 and 1978 are unpublished and have been supplied by the Department of Statistics and U.W.I.
[d] *Source*: Sinclair 1974b.

the case however, since even at ages 10–29 the increase based on vital statistics was 29 per cent.

The cumulative fertility rates from the census and the survey also showed a fertility increase, as mentioned in section 6.1. Fertility rises have also been observed in other Caribbean and Latin America populations during the same period. This fact and the agreement of the three sources, census, vital statistics and survey, about this trend, further support its existence. The reasons for increasing fertility are discussed later in this chapter.

The differences in amount of fertility increase shown by the two sources indicate, however, that one or both sources are incorrect. It appears likely that part of the 36 per cent increase shown by the vital statistics rates is due to improvements in coverage of the system. The vital statistics rates are clearly underestimated, but the ratio of the total fertility rate (TFR) from vital statistics to that from the survey shows that the amount of underestimation has declined over time: for 1950–54, 1955–59 and 1960–64, these ratios are 0.74, 0.84 and 0.89 respectively. If under-registration was the same in 1950–54 as it was in 1960–4, the increase in fertility, according to vital statistics, would have been only 12 per cent. Comparison of the number of children by single year of age in the 1960 census with vital statistics data on number of births in comparable years does not help, since the census underestimates children relative to vital statistics, as well as being affected by emigration.

A further factor, which will be discussed later in this chapter, is that the survey data may themselves over-estimate the amount of fertility increase if older women tended to displace the dates of births closer to the survey date. This would have resulted in an artificial inflation of the level of fertility in the mid-1960s, and an artificial enlargement of the increase from the 1950s to the 1960s. The later discussion shows that after taking all factors into account, the amount of real increase was probably about 10 per cent.

From the early 1960s to 1974, the annual rates show an overall decline of about 2.0 children in the total fertility rate during this period. The decline was fairly steady, but fluctuated somewhat from year to year, probably because of a combination of reasons such as age heaping, displacement of births, sampling fluctuations caused by the small denominators of some cells, or real variations in social and economic conditions. Five-year averages are shown in table 24, to adjust for these fluctuations. These averaged rates show a decline of 1.0 child for the same period, although, if the rapid decline within the last five year period, 1970–74, is accepted, then the decline up to the mid 1970s is closer to 1.5 child, but not as much as 2.0 child, which the annual rates show.

The rise in secondary education and the existence of a strong family planning programme in Jamaica since the 1960s makes the decline plausible. The level of use of contraceptives in the country was fairly high, as seen both in the JFS 1975 survey and in an earlier 1972 survey: for example the JFS showed that 66 per cent of women ever in union had used contraception at some time in their life, and 45 per cent of exposed women were currently using, while even in 1972, 52 per cent of women ever in union had used at some time. It is difficult to evaluate the JFS fertility rates because after 1963 there is no continuous record of age-specific rates from an external source. Crude birth rates (CBRs) from vital statistics have shown a decline of about 30 per cent from the 1960 rate of 42 to a rate of 29 in 1976 or to a rate of 28 according to the 1975–76 JFS. Standardization of the 1970 birth rate, assuming the 1960 age structure to be the standard, raised the CBR slightly from 34.4 to 35.4 and a similar standardization of the CBR based on the survey population raised this survey CBR from 28.0 to 30.0. These increases show that emigration has slightly reduced the proportion of women aged 15–49 in the population between 1960 and 1975. Nevertheless the bulk of the fertility decline is not due to age-structural change. It is noteworthy that even in the late 1960s Roberts (1968) suggested that despite the use of period fertility measures during 1943–60, the lack of a rise in completed cohort fertility implied that fertility decline might be imminent and that the family planning programme was beginning to take effect.

The recent decline in fertility found by the survey may be evaluated by comparing those age-specific rates which

Table 24 Age-Specific Fertility Rates Averaged over Five-Year Periods, from the JFS (1950–74) and from Vital Statistics (1950–78)

Period	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	TFR[a]
A Age-specific fertility rates from JFS 1975–76									
1950–54	15	134	234	258					5.7
1955–59	13	159	266	280	249				6.1
1960–64	15	178	286	299	252	191			6.4
1965–69	6	174	291	271	244	171	55		6.1
1970–74	7	162	265	245	196	123	60	12	5.4
B Age-specific fertility rates from vital statistics									
1950–54	1	108	239	207	150	99	37	6	4.2
1955–59	1	137	275	254	183	120	41	7	5.1
1960–63	2	151	295	267	218	140	50	8	5.7
1970	2	119	244	215	155	129	45	7	4.6
1977–78	NA	115	205	182	120	76	27	4	3.6

[a]In computing TFRs for the survey the empty cells are estimated by the rate for the later five-year period.

are available from external sources to survey rates. Published age-specific rates from vital statistics are available up to 1963 but after 1964 only unpublished rates are available, and only for 1970, 1977 and 1978. Sinclair (1974) calculated rates from the 1970 census presumably based on special tables on births in the year preceding the census, but her methodology is not discussed, and it is quite possible that her rates are adjusted for under-reporting. These rates are shown in table 23.

The total fertility rate from vital statistics was 5.6 and 5.7 for the calendar years 1962 and 1963, compared to 6.6 and 6.7 for the years 1962 and 1963 of the JFS. Clearly the under-registration in vital statistics which existed in the 1950s continued into the early 1960s. It is possible, however, that not all of the difference between the sources was due to under-registration. Misdating of births may explain some of this difference if, for example, births were shifted towards the date of the survey by older women. Since the 'rise' in fertility from the early 1950s to the early 1960s is quite large (18 per cent), it seems likely that some long-run displacement occurred. Even if long-run displacement of births forwards towards the date of interview occurred, however, it is unlikely that it could explain a difference of nearly one child in the TFRs from the two sources. The conclusion, therefore, is that some under-registration of births probably existed in the early 1960s. This under-registration apparently continued to exist in 1970, when the vital statistics showed a total fertility rate of 4.6, compared to the JFS rate of 5.8. The JFS rate is clearly too high, since some heaping occurred in the year 1970, but even so, this discrepancy suggests that under-registration still exists, at the level of 10–12 per cent. In contrast, the rate calculated from 1970 census data yielded a TFR that was very close to that of the survey, although the census was still lower (5.5 compared to 5.8) and the age patterns of the rates were slightly different. It would be premature to conclude that the census of 1970 achieved better coverage than vital statistics, however, since we do not know whether the rates based on the census were adjusted for underenumeration.

The very low total fertility rate of 3.6, shown in the vital statistics rates of 1977–8, further argues that under-registration continues into the present. If the JFS rate of approximately 4.8 for 1973–4 is accepted, this implies that a decline of 4.8–3.6 = 1.2 child occurred in a period of 4–5 years, and this seems highly unlikely. Despite this disagreement between the two sources in age-specific fertility rates, the CBRs are very close. The CBR is heavily dependent on estimated mid-year populations, however, and it is possible that published CBRs may be too high if mid-year population estimates were too low. The 1982 census will help in answering this question. In the meantime the age-specific fertility rates, which have less cause for error, should be relied upon more as a means of estimating fertility trends and under-registration.

Analysis of the pattern of the survey rates shows that some heaping occurred on the 'round' calendar year 1965 and 1970, roughly 5–6 and 10–11 years before the survey. This could have been caused because of the tendency to say that children were the round age of 10 or 5, or possibly a preference for the round calendar years of 1965 or 1970. Heaping was more serious on the year 1965, with the very high TFR of 7.0 children, causing adjacent years to have too low rates. Heaping on 1970 was comparatively less severe. Secondly, the very sharp decline in fertility seen in the survey rates from 1972 to 1974 seems too sudden to be possible. The existence of error in dating births, resulting in the transference of births backwards, may explain this unexpectedly rapid decline. This seems unlikely, given the generally high educational level of Jamaican women, and the fact that nearly all recent births were reported with calendar year and month. Alternatively, the severe economic problems of the country in the early and mid-1970s may also help to account for a sharp fertility decline. A conservative interpretation of the data to allow for any error would be to average the rates of the last three complete calendar years, giving a TFR of 5.1 for the period. This would enable us to roughly estimate the amount of decline in the past 13 years. This conservative estimate of fertility decline is about 1.3 children, from a TFR of 6.4 in the early 1960s, to 5.1 in 1972–74.

6.3 COHORT AND PERIOD FERTILITY RATES

Fertility rates for five-year cohorts and for five-year periods before the survey were calculated as a means of studying recent trends in greater detail, and also in order to evaluate the quality of the data. The sets of rates can be used to test whether births have been shifted in time (displaced) or whether they were omitted altogether. Rates are also presented for some subgroups of the population, particularly with the aim of seeing whether evidence for misreporting (displacement or omission) varies among subgroups.

Some explanation of the rates presented is necessary and the statement given in a previous evaluation study (Balkaran 1981) would serve here, using table 25 of this paper as the example.

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 of age. 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 25 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 236 in the five years preceding the survey and 287 in the period 5–9 years before the survey, these rates corresponding to the cohorts aged 25–29 and 30–34 at survey, respectively.

Panel B 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 2.79 children at the time of the survey, compared with a mean parity of 3.04 for the cohort 30–34 five years earlier, when it was also 25–29.

Panel C 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 of 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 4.89 children, compared with 5.76 children up to the same age in the period 5–9 years before the survey.

Table 25 Birth Cohort-Period Specific Fertility Rates, for Five-Year Birth Cohorts of Women and for Five-Year Periods before the Survey

Age at end of period	Years prior to survey						
	0–4	5–9	10–14	15–19	20–24	25–29	30–34
A Fertility rates							
15–19	53	78	88	69	67	49	45
20–24	234	234	252	237	186	170	
25–29	236	287	303	277	253		
30–34	205	248	285	270			
35–39	155	188	220				
40–44	94	117					
45–49	31						
B Cumulative fertility of real cohorts (P)							
15–19	.27	.39	.44	.35	.34	.25	.23
20–24	1.56	1.61	1.61	1.52	1.18	1.08	
25–29	2.79	3.04	3.04	2.56	2.34		
30–34	4.07	4.28	3.99	3.69			
35–39	5.05	4.93	4.79				
40–44	5.40	5.38					
45–49	5.53						
C Cumulative fertility of synthetic cohorts (F)							
15–19	.27	.39	.44	.35	.34	.25	.23
20–24	1.44	1.56	1.70	1.53	1.27	1.10	
25–29	2.62	3.00	3.22	2.92	2.53		
30–34	3.64	4.24	4.64	4.27			
35–39	4.42	5.18	5.74				
40–44	4.89	5.76					
45–49	5.04						

Source: JFS, 1975–76

Table 25 shows that fertility has declined in the last 15 years, with the older age groups having earlier and larger declines. The decline from 10–14 years ago to 5–9 years ago was about 15 per cent for the 30–34 and 35–39 age groups, but was only about 5–8 per cent for women aged 20–24 and 25–29. From the period 5–9 years ago to the period 0–4 years ago, substantial declines also occurred for most age groups: 32 per cent for the 15–19 group, and about 17 per cent for women aged 25–44. It is possible that the survey design, which assumed that all girls aged 15–19 and attending school had no unions and no births, may have resulted in undercoverage of births and unions to 15–19 year olds. The group aged 20–24 showed almost no change, however, resulting in a change in the usual age pattern of reproduction; in the most recent five-year period fertility was equal for age groups 20–24 and 25–29, whereas before this recent period the peak fertility rate occurred at ages 25–29.

A second important pattern that shows up in these rates is an apparent increase in fertility from older cohorts of women relative to younger women. For example, the rates at age 15–19 were 45, 49, 67 and 69 for women currently aged 45–49, 40–44, 35–39 and 30–34 respectively. Similarly large rises occurred at age 20–24 (from 170 to 237) and at age 25–29 (from 253 to 303); this is reflected in rises in the cumulative fertility of the cohorts as well: for example the average number of children born by age 25–29 increased from 2.34 for the 45–49 cohort to 3.04 for the 35–39 cohort (see panel B of table 25).

A similar pattern of fertility for older cohorts was observed in the fertility schedules in a number of WFS surveys though these cases were not as extreme as that of Jamaica (eg Pakistan, Bangladesh, Jordan, Dominican Republic and Guyana), and was interpreted to imply displacement of births away from the early years of women's reproductive life and towards the recent period (Potter 1977a). One suggested explanation is that the structure of the pregnancy history, beginning with the earliest birth and moving forward, in itself facilitates displacement of births.

In the case of Jamaica the interpretation is not as straightforward, however. Two known real trends may have coincided to produce or exaggerate an existing 'Potter effect' of displacement. Firstly some real increase in fertility occurred, beginning after the second world war and continuing into the early 1960s, as described in the previous section. This rise in fertility is seen in the large decreases in the proportions childless from the 1943, 1960 and 1970 censuses. Although little evidence is available to account for the fertility increase, it is likely that improvements in fecundity occurred, due to changes in biomedical and social conditions (eg the reduction in infectious diseases in general, and in venereal infections in particular, and improvements in public health care) and caused the declines in childlessness and the rise in period fertility (see Sinclair 1974a, Roberts 1968, Roberts 1975, Cumper 1963, Tekse 1967 and Sukhdeo 1973). The decline in percentage childless from the 45–49 to the 35–39 age-group was 4 per cent for the survey population. It is also possible that some change in social norms may have occurred, causing a reduction in

the proportion of unmated women, and a small decline in the mean age at entering the first union, as discussed in chapter 5. Finally the average length of breastfeeding has probably declined over the past 20–30 years, and is now only seven months. If the union status data obtained in the JFS were accepted at face value, 'marital' age-specific fertility rates, based on exposure within reported unions only, could be calculated. From these rates, shown in table 26, it indeed appears that increased participation in unions was responsible for a great part of the observed fertility increase from the 1940s to the early 1960s. Instead of fertility increases of about 100 per cent at age 15–19 and about 40 per cent at age 20–24 (obtained when age-specific rates are considered), within union rates yield increases of only about 20 per cent at ages 15–19 and 20–24. The discussion in chapter 5 suggests, however, that older women overstated their age at the first union, and to the extent that this is true, the within union rates for older cohorts, at ages 15–24, should be lower and the real fertility increase within unions would be higher than the observed 20 per cent.

Secondly the recent decline in fertility, which includes declines among the older cohorts, would further mimic the expected patterns caused by displacement. Displacement towards the older ages would mean that older cohorts would appear to have higher fertility at their older ages compared to younger cohorts, and fertility decline would show the same pattern. These two known real trends in fertility, a rise in the period about 15–19 years ago and a recent decline, could together produce much the same pattern as displacement.

It is doubtful, however, that the whole of the observed increase is real. The rise in fertility at age 15–19 and 20–24, seen in the cohort-period specific rates (96 per cent and 48 per cent respectively) is much larger than the overall increase in current fertility (TFR), using survey data. This suggests that some of the increase at young ages was probably caused by either omission or displacement of births by older women. If displacement occurred, this would imply that the recent decline in fertility at older ages was overstated. For example the fertility rate at age 35–39, for the 45–49, 40–44 and 35–39 cohorts, declined from 220 to 188 to 155 during the last 15 years (table 25), a total decline of 30 per cent. If the rate for the 45–49 cohort is inflated by displaced births, however, the actual decline would be somewhat less than the observed 30 per cent. The situation at ages 30–34 is similar: both the 40–44 and 45–49 cohorts may be partially inflated and the actual decline is probably less than the observed 28 per cent for the past 15 years. In the case of omission, trends at older ages would be unaffected.

One argument for suspecting displacement of births is the change in the shape of the fertility curve observed from younger cohorts to older cohorts (see table 25). Even where a rise in fertility occurs it is unlikely that the shape of the fertility curve would change. The 45–49 and 40–44 cohorts reached their peak fertility at central age 30, while younger cohorts (30–34 and 35–39) peaked at central age 25. A peak age as high as 30 is highly unusual, and combined with a different peak for other cohorts in the same population is highly suspect. Moreover the slope between central ages 20 and 25 (ie the increase in the fertility rate) was much steeper for the two oldest cohorts, about 50 per cent, compared to 28 per cent for the cohort aged 35–39 and 14 per cent for the 30–34 year old cohort. The faster rise between these ages results in a 'catching-up' effect seen in the cumulative number of children ever born in panel B of table 25. For example, a striking case is seen where, at central age 25, the 45–49 and 35–39 cohorts differed by as much as 0.7 child; but by central age 35, the difference was only 0.3 child. The fact that a difference of 0.3 child still remained implies that some real fertility increase did occur, but it was clearly not as large as it appeared to be at the young ages. The shape of fertility curves, shown in figure 4 for true cohort-age rates, not for the cohort-period rates in table 25, shows the change in shape from older to younger cohorts of women.

P/F ratios, formed by relating actual achieved fertility (P) to a synthetic cross-sectional estimate (F), are a good test for displacement or omission, but only when fertility has remained more or less constant over time (Brass 1978, Goldman and Chidambaram 1980). Where fertility is declining this ratio will be above 1.00 and if fertility rose it would be below 1.00. Thus, although in a situation of constant fertility deviations from 1.00 would indicate that omission or overstatement was occurring, if fertility itself is changing misreporting will be concealed by real changes. Table 27 presents the results, and shows that small increases in fertility occurred up to the period 10–14 years before the survey, with decline after that, especially in the most recent five-year period.

6.4 DIFFERENTIALS IN FERTILITY

The pattern of fertility rates among subgroups of the population may also be used to test the quality of birth data. This is especially true if there is reason to expect sub-

Table 26 Cohort-Period Specific Fertility Rates, for Periods spent Within Unions Only

Age at end of period	Period before survey date						
	0–4	5–9	10–14	15–19	20–24	25–29	30–34
15–19	284	321	318	323	304	316	289
20–24	322	351	366	356	320	312	
25–29	275	329	359	342	323		
30–34	228	283	311	314			
35–39	173	212	251				
40–44	109	136					
45–49	36						

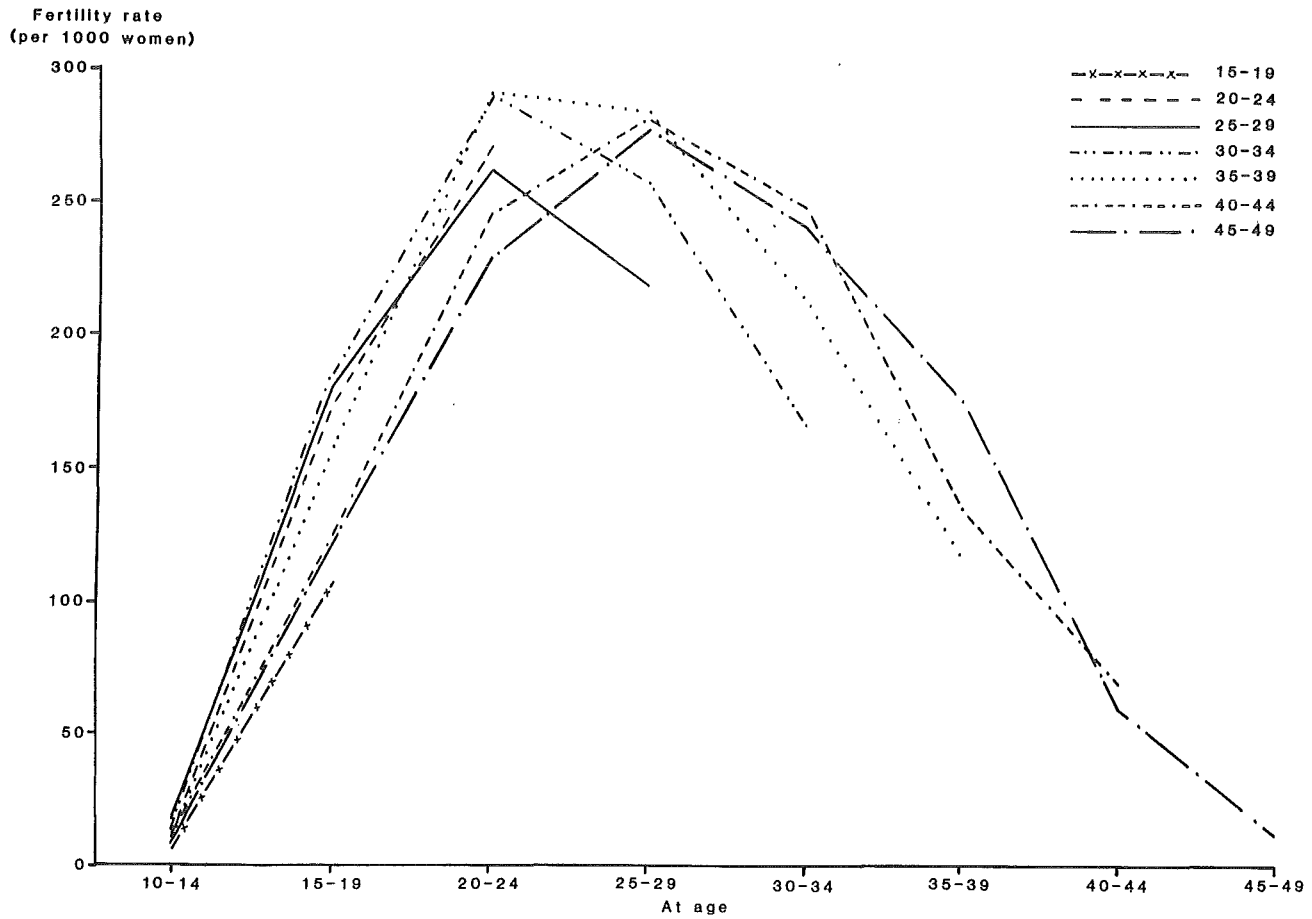

Figure 4 Pattern of Cohort-Age Fertility Rates (per 1000 Women) for Five-Year Cohorts

groups to differ in quality of reporting dates and events. For example, if better educated women or urban women had better reporting, we would expect that any pattern of displacement or other errors observed for the total population would be less evident in their rates and more evident for less-educated or rural women. Cohort-period rates are presented for three sets of subgroups – residence, education and current union status groups (tables 28–30). The normal expectations of reporting quality for these subgroups are that quality would be higher for urban and for better-educated women. In the case of union status groups one generalization that is fairly well supported is that common law women are of lower class, and this leads to the prediction that their reporting will be less accurate than that of married or visting women. In fact, cohorts of current union status subgroups are to some degree non-comparable, eg visiting women aged 45–49 are a much smaller and more selected group than visiting women aged 20–24, and a similar statement can be made about married women at the extreme ages. Age selectivity affects all subgroups, however, and there is no reason to believe that, in the case of union status subgroups, it is so severe as to invalidate all comparisons across cohorts within subgroups.

The results (tables 28–29) show that the expected differentials did occur: urban women have lower fertility than rural women, and with only a few, minor exceptions, fertility declines as education increases. These differentials confirm that the data do not suffer from fundamental distortion.

Tables 31 and 32 give two sets of summary measures of fertility increase for the subgroups. The results are complicated and in some cases contradictory. Looking first

Table 27 P/F Ratios by Age and by Years since First Union for Five-Year Periods before the Survey

Age at end of period	Years prior to survey						
	0–4	5–9	10–14	15–19	20–24	25–29	30–34
20–24	1.08	1.03	0.95	0.99	0.93	0.98	
25–29	1.06	1.01	0.94	0.88	0.92		
30–34	1.12	1.01	0.86	0.86			
35–39	1.14	0.95	0.83				
40–44	1.10	0.93					
45–49	1.10						

Table 28 Cohort-Period Fertility Rates (per 1000 Women) for Five-Year Periods prior to Survey, by Area of Residence

Age of cohort at end of period (No of women)	Years prior to survey						
	0–4	5–9	10–14	15–19	20–24	25–29	30–34
A Urban area							
15–19 (422)	53	67	85	65	46	33	38
20–24 (313)	204	210	210	205	153	140	
25–29 (290)	221	248	292	261	212		
30–34 (204)	170	231	241	239			
35–39 (166)	129	124	187				
40–44 (127)	63	82					
45–49 (137)	25						
B Rural area							
15–19 (580)	55	89	92	75	84	58	50
20–24 (331)	263	268	298	262	206	192	
25–29 (216)	257	331	312	286	283		
30–34 (185)	243	261	312	291			
35–39 (217)	175	226	243				
40–44 (211)	112	141					
45–49 (191)	35						

Source: JFS, 1975–76

Table 29 Cohort-Period Fertility Rates (per 1000 Women) for Five-Year Periods prior to Survey, by Level of Education

Age of cohort at end of period (No of women)	Years prior to survey						
	0–4	5–9	10–14	15–19	20–24	25–29	30 +
A Incomplete primary education							
15–19 (97)	136	118	124	110	84	60	51
20–24 (153)	281	313	284	266	215	199	
25–29 (147)	259	324	310	281	271		
30–34 (131)	226	250	296	290			
35–39 (176)	183	191	241				
40–44 (178)	100	139					
45–49 (174)	31						
B Complete primary education							
15–19 (169)	123	88	101	61	58	38	48
20–24 (271)	263	251	275	233	171	164	
25–29 (228)	254	300	323	291	238		
30–34 (195)	217	270	294	256			
35–39 (159)	145	216	208				
40–44 (125)	102	103					
45–49 (121)	31						
C Secondary or higher education							
15–19 (762)	26[a]	38	23	6	34	29	6
20–24 (225)	164	114	114	145	86	42	
25–29 (133)	179	178	213	217	194		
30–34 (63)	121	153	206	200			
35–39 (47)	89	63	146				
40–44 (35)	29	42					
45–49 (33)	24						

[a]Value obtained by assuming 15–19 year-olds attending school had the equivalent of secondary education.
Source: JFS, 1975–76

Table 30 Cohort-Period Fertility Rates (per 1000 Women) for Five-Year Periods prior to Survey, for Current Union Status Groups

Age of cohort at end of period (No of women)	Years prior to survey						
	0–4	5–9	10–14	15–19	20–24	25–29	30–34
A Married							
15–19 (7)	*	68	50	58	66	52	52
20–24 (79)	281	187	250	238	209	176	
25–29 (140)	257	274	321	318	302		
30–34 (155)	209	245	315	293			
35–39 (172)	145	213	238				
40–44 (171)	100	116					
45–49 (159)	35						
B Common law							
15–19 (72)	250	127	116	98	87	51	45
20–24 (185)	320	280	277	262	173	155	
25–29 (178)	265	342	309	277	190		
30–34 (128)	244	285	287	241			
35–39 (94)	204	195	183				
40–44 (74)	119	135					
45–49 (58)	28						
C Visiting							
15–19 (166)	131	66	104	58	64	49	29*
20–24 (215)	221	248	222	240	170	190*	
25–29 (84)	200	267	300	206	267*		
30–34 (45)	191	288	230	314*			
35–39 (50)	180	158	333*				
40–44 (33)	73	143*					
45–49 (21)	29*						

*Rates unreliable because of small number of cases.
Source: JFS, 1975–76

at table 31, we find that the increase in cumulative fertility by central age 30 for the total sample was 0.6 child, or 16 per cent. The increase was the same for both urban and rural areas, 0.7 child, although the percentage increase was greater for the urban group. Since we expect reporting to be reasonably reliable in urban areas, the evidence supports the existence of some real fertility increase.

It is nevertheless possible that both subgroups have some reporting error. Analysis of the education differentials is limited by the small sample size of the secondary educated group, where rates fluctuate widely. The secondary educated group had the smallest absolute increase, however (0.5 child), while the other two groups had larger increases, 0.9 child for the completed primary group and 0.7 child for the incomplete primary group. Again the percentage increases are highest for the better educated, but this is a function of the lower level of fertility of these groups. Again the evidence partly supports the existence of some real increase in fertility, since all three groups showed an increase, even the secondary educated, whose reporting is expected to be reliable, and the complete primary educated group had a higher increase than the lowest educated group.

Analysis of current union status groups is limited by the small number of visiting women. However, there is a large difference between the increase for married women (0.4 child) and common law women (1.7 children). Although these are current union status groups, and women of both groups may have spent periods in other types of union than their present one, it is likely that we are observing a basic difference in misreporting. Common law women currently aged 45–49, 40–44 and 35–39 have an older fertility pattern than married women at the same ages (table 28), in addition to having larger increases at all the 'central ages' (panel B, table 29). It is unlikely that the common law group alone would have benefited from such large increases, implying that this group had the greatest misreporting error. Moreover the extent of displacement was almost as large for each of these cohorts of common law women, ie it did not decrease in size as age declined. The large difference in total cumulative fertility for the 45–49 group between married and common law suggests that some omission of births may have also occurred among older common law women.

The shape of the fertility curve is also another method of checking on the existence of displacement. Among the subgroups studied here, the ones with peak fertility at the exceptionally late central age of 30 for both the 45–49 and 40–44 age groups are rural women, incomplete primary educated women, common law and visiting women. The 45–49 year old age group had peak fertility at central age 30 for most subgroups, but for two groups, the secondary educated and married women, skewing of the fertility curve was less severe, with a plateau at age 20–34, rather than peaking at central age 30. Although the percentage of fertility

Table 31 Number of Children Born by Age 30–34 to Cohorts of Women currently Aged 45–49, 40–44, 35–39 and 30–34, for the Total Population and for Subgroups

Subgroups	Current age of cohort				Maximal rise (%)	Absolute increase (children)
	45–49	40–44	35–39	30–34		
Total population	3.69	3.99	4.28	4.07	16	0.6
Residence						
Urban	3.14	3.44	3.87	3.47	23	0.7
Rural	4.08	4.31	4.59	4.74	16	0.7
Education						
Incomplete primary	4.06	4.26	4.55	4.72	16	0.7
Complete primary	3.53	3.97	4.42	4.27	25	0.9
Secondary/higher	2.21[a]	2.69[a]	2.73[a]	2.10[a]	24	0.5
Current union status						
Married	4.12	4.47	4.35	4.00	8	0.4
Common law	3.16	3.94	4.72	4.81	52	1.7
Visiting	4.00[a]	3.28[a]	4.46	3.69[a]	12	0.5

[a]Cells with less than 50 women.

Table 32 Per Cent Increase in Cohort-Period Rates during the Period 30–34 Years before the Survey to the Period 15–19 Years before the Survey, at Central Ages 15, 20, 25 and 30, for the Total Population and for Subgroups

Subgroups	Per cent increase at central ages			
	15	20	25	30
Total population	96	48	20	6
Residence				
Urban	124	50	38	1
Rural	84	55	10	7
Education				
Primary < 4 yrs	143	43	14	2
Primary 4+ yrs	110	68	36	15
Secondary/higher	*	*	12	*
Current union status				
Married	27	42	6	8
Common law	158	79	63	19
Visiting	112	31	46	3

*Rates fluctuate widely due to small number of cases, therefore per cent change not calculated.
Source: JFS, 1975–76

increase was higher for some of the groups who are expected to be better reporting (the urban, the better educated) differences in the degree of skewing of the fertility curve do agree with expectations about quality of reporting – the rural, the incomplete primary educated and the common law subgroups, expected to be worse reporting, had the most pronounced skewing of the curve.

The uniformity of the fertility increase argues that some of the fertility increase must be real. On the other hand, the existence of differentials in the amount of increase and in the shape of the fertility curve among socio-economic subgroups suggests that some error in reporting may have occurred. It is even possible that subgroups had actual differences in amount of increase. For example, the higher educated and urban groups may have had larger increases because improvements in health services were most accessible to them or because they took more advantage of such improvements.

Alternatively, lower status groups such as the common law may have had somewhat larger than average increases than the married group, for example, because they may have had a higher rate of venereal disease. Even allowing for the possibility of real differences among subgroups, the data still suggest that some displacement of births occurred among most subgroups, and perhaps even some omission among the common law group. Table 32 makes it clear that fertility change was highest at ages 15–29: it is quite likely that real increase was highest at these ages, but displacement of births among older women is also more likely to occur from these young ages towards the later part of their reproductive life.

6.5 FERTILITY RATES BY BIRTH ORDER

Rates of attaining first births can be used as a check on errors in birth history data; although the speed of having

the first birth may change over time, according to age of the woman, it is unlikely that the proportion eventually becoming mothers would change in a given population. The one exception to this generalization is found in cases such as that of Jamaica where fecundity itself probably had changed over time.

In the discussion so far it has been shown that there were increases in fertility in the period beginning from about 20–24 years ago up to about 10–14 years ago (ie between 1951–55 and 1961–65). In addition, fertility has declined recently, beginning from 5–9 years ago for some age cohorts. The P/F ratios shown in table 27 reflect these trends.

The ratios of less than 1.00, found at periods of more than 10 years before the survey, imply some omission or displacement of births, but they are at least partly due to the real rise in fertility.

Panel A of table 33 shows that the percentage who were mothers by age 15–19 and 20–24 increased substantially up to the period 10–14 years before the survey, but there is much less change at older ages. The cumulative proportions who become mothers towards the end of childbearing did not change as drastically, however. This pattern is consistent with displacement and/or omission of first births. On the other hand, the decline in the mean age at entering the first union would explain some of this diminishing difference, and improvements in health which increased the likelihood of the first conception being a live-birth would also account for some of the difference. The proportion who became mothers was 90 per cent for 45–49 year olds, 92 per cent for 40–44 year olds and 94 per cent for 35–39 year olds, showing that a real increase of fecundity did occur, with the percentage of childless women decreasing from 10 to 6 per cent. This supports the results of analysing fertility differentials among socio-economic subgroups: that some real fertility increase occurred, but that displacement or omission of early births also occurred among older age groups.

Panel C of table 33 shows age-specific fertility rates for all births of order four or higher. There appears to be some increase in high-order births up to the period 10–14 years before the survey for younger women. Although this rise could be partly due to improvements in fecundity in the broad sense (ie not only a decline in primary sterility but declines in morbidity and the resulting benefits for fertility) and increased exposure to conception, such a rise is also consistent with displacement and/or omission of births. Secondly the recent trend in these rates, from 10–14 years before the survey, supports the substantial decline in fertility described earlier.

6.6 TESTS FOR OMISSION OF LIVE BIRTHS

The tests carried out up to this point were mainly directed towards finding out whether displacement of births

Table 33 Cohort-Period Fertility Rates for First Births and Births of Order Four or Higher (per 1000 Women) and Cumulative Proportions of Cohorts becoming Mothers, for Five-Year Periods prior to Survey

Age 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	37	58	60	52	50	37	37
20–24	87	79	97	86	82	79	
25–29	34	28	39	43	40		
30–34	9	9	19	16			
35–39	3	2	7				
40–44	1	1					
45–49	0						
B Cumulative proportions becoming mothers at end of period							
15–19	.19	.29	.30	.26	.25	.19	.19
20–24	.73	.70	.75	.68	.60	.58	
25–29	.87	.89	.88	.81	.78		
30–34	.93	.92	.91	.86			
35–39	.94	.92	.90				
40–44	.92	.90					
45–49	.90						
C Birth rates for order ⩾ 4							
20–24	25	34	28	34	13	12	
25–29	106	141	139	111	96		
30–34	152	194	196	179			
35–39	140	169	187				
40–44	88	111					
45–49	29						

Source: JFS, 1975–76

occurred, and only incidentally throw some light on omission of births. Omission of births is much more difficult to detect, because the two most used tests, sex ratio at births and infant or child mortality rates, both suffer from the large sampling errors associated with small numbers of cases. Nevertheless if any consistent patterns are discerned, this would be a stronger basis for interpreting the data than variation in individual rates. On the basis of the general opinion that female births are more likely to be omitted than male births, it may be fruitful to examine sex ratios at birth. Secondly, since children who died while young may also be more likely to be omitted than living children, infant and child mortality rates may be useful as a test of birth omission.

Sex Ratios at Birth

Sex ratios of live births are shown in table 34 by current age groups, education, residence and order of birth groups. Given the problem of random fluctuation due to small numbers of cases, we would consider patterns of deviations in the rate as more reliable evidence of omission than the occasional extreme rate. Examination of the rates in table 34 shows no such consistent pattern, however. The only case where there is some suggestion of omission is found among births of order 1, occurring at 15 years or more before the survey, if the lower rate for births occurring at 25+ years before the survey may be discounted. A further suspicious case is that of the secondary group, where the sex ratio is consistently high in all periods, and overall is 1.22. Although the number of births is relatively small, the consistency of the pattern suggests that this group may have omitted some female births even though this seems unlikely for the higher educated. All other subgroups show no evidence of omission of female births, relative to male births.

Proportions Dead of Children Ever Born

The proportions of children who died by age four are shown in table 35 for five-year age groups, and for five-year periods before the survey in table 36. The expected pattern of steadily increasing proportions dead as age increases, and at earlier periods, is found for the total number of births. The proportions dead by sex of the child do not always increase consistently as age of women increases, however. Also, although in general the proportion dead is higher for male children, as expected, small reversals do occasionally occur. Historical fluctuations and sampling error probably account for these minor variations.

Table 35 Proportion Dead by Age Five ($_5q_0$) of Children Ever Born, by Current Age Groups and by Sex of Child

Current age of mothers	Total	Male	Female
15–19	0.043	0.047	0.039
20–24	0.048	0.051	0.045
25–29	0.048	0.058	0.038
30–34	0.053	0.044	0.063
35–39	0.071	0.082	0.060
40–44	0.087	0.080	0.094
45–49	0.089	0.098	0.080
Total	0.068	0.071	0.065

Source: JFS, 1975–76

Table 34 Sex Ratios at Birth for Five-Year Periods prior to Survey

Years prior to survey	Total	Current age of mother				Level of education			Area of residence		Order of birth		
						Primary							
		< 25	25–34	35–44	45+	Incomp[a]	Comp[a]	Second+	Urban	Rural	1	2–3	4+
0–4	1.04	1.11	1.03	0.97	0.72	1.06	0.97	1.22	1.08	1.01	1.12	1.09	0.97
N	(2502)	(1004)	(994)	(454)	(50)	(888)	(1151)	(462)	(1084)	(1418)	(567)	(837)	(1098)
5–9	1.06	1.05	1.08	1.04	1.10	0.98	1.12	1.15	1.02	1.10	1.07	1.07	1.06
N	(2385)	(256)	(1148)	(790)	(191)	(1044)	(1108)	(228)	(987)	(1398)	(464)	(722)	(1201)
10–14	1.08		1.05	1.08	1.17	1.10	1.05	1.21	1.07	1.09	1.08	1.09	1.09
N	(2132)		(712)	(1059)	(360)	(1022)	(950)	(159)	(857)	(1275)	(457)	(714)	(962)
15–19	1.05		0.95	1.08	1.04	0.98	1.14	1.28	1.13	1.01	1.29	0.90	1.08
N	(1510)		(148)	(920)	(442)	(811)	(589)	(107)	(574)	(936)	(376)	(589)	(544)
20–24	1.16			1.26	1.08	1.14	1.18	1.29	1.11	1.19	1.27	1.10	1.14
N	(861)			(441)	(415)	(504)	(297)	(55)	(280)	(581)	(306)	(375)	(180)
25–34	1.12			1.15	1.11	1.00	1.30	*	1.29	1.05	1.12	1.13	*
N	(439)			(86)	(353)	(272)	(154)		(144)	(295)	(254)	(164)	
Total	1.07	1.10	1.05	1.08	1.08	1.04	1.08	1.22	1.08	1.07	1.15	1.05	1.05
N	(9829)	(1261)	(3007)	(3750)	(1811)	(4541)	(4249)	(1024)	(3926)	(5903)	(2424)	(3401)	(4006)

[a]Incomplete primary education is all those with less than eight years, while complete primary is equal to eight years.
*Too few cases to calculate ratio.
Source: JFS, 1975–76

Table 36 Probability of Dying within the First Year ($_1q_0$), the Second Year ($_1q_1$) and the Third to the Fifth Year ($_3q_2$) of Birth for Periods in the Past, Derived from Fertility Histories

Rate	Years prior to survey					
	1–4	5–9	10–14	15–19	20–24	25–29
$_1q_0$	0.046	0.037	0.050	0.074	0.079	0.088
$_1q_1$	0.005	0.012	0.009	0.014	0.017	0.049
$_3q_2$	*	0.005	0.006	0.008	0.010	0.012

*Incomplete exposure.
Source: JFS, 1975–76

7 Infant and Child Mortality

The quality of mortality data can be evaluated because certain general patterns and trends are expected. Infant and child mortality has probably declined over time; male mortality is usually higher than female; the proportion dead should increase with the age of mother, and a U-shaped pattern of infant mortality rates is usually found, by age of the mother at the time of the birth. These are tests of internal consistency of the data, but in addition the infant mortality rates may be compared with external data, from vital registration, as a further check. In this discussion only direct estimates are used, although indirect estimation techniques could have been used on the data on proportions dead among children ever born (Brass and Coale 1968).

7.1 INFANT AND CHILD MORTALITY RATES FOR PERIODS IN THE PAST

Probabilities of dying in the first year of life, the next two years and the third through fifth years of life are shown in table 36 for periods before the survey. Mortality declined steadily from the earliest period (25–29 years before the survey) to the present, with declines of 48 per cent for the first year of life, and 62 per cent for the first two and first five years of life. Most of this decline had occurred by 10–14 years before the survey, however, and relatively little change occurred from that time to the present. The trend over time differed in tempo among the different rates, however: the rate for the first year of life declined much more slowly in the two earliest periods (15–19 to 25–29 years before the survey) than the rates ${}_1q_1$ or ${}_3q_2$, 15 per cent compared to about 70 per cent and 35 per cent respectively. This is suspicious since there is no reason to expect infant mortality to decline more slowly than child mortality. The data therefore suggest that omission of infant deaths occurred during the period 20–29 years before the survey. In addition, there appears to be some error in the age of child's death for the period 5–9 years before the survey, which leads to the ${}_1q_0$ rate being too low, and the ${}_1q_1$ rate being too high.

Infant and child mortality rates by calendar year of child's birth are shown in figure 5. The steady decline in mortality was interrupted by an epidemic in the late 1950s, with the infant mortality rate increasing from almost 50 to about 90. This epidemic was apparently limited mainly to infants, however, since the rate for children aged 1–4 did not increase as much. The steady decline was resumed for all ages after 1959, and lasted until the mid-1960s.

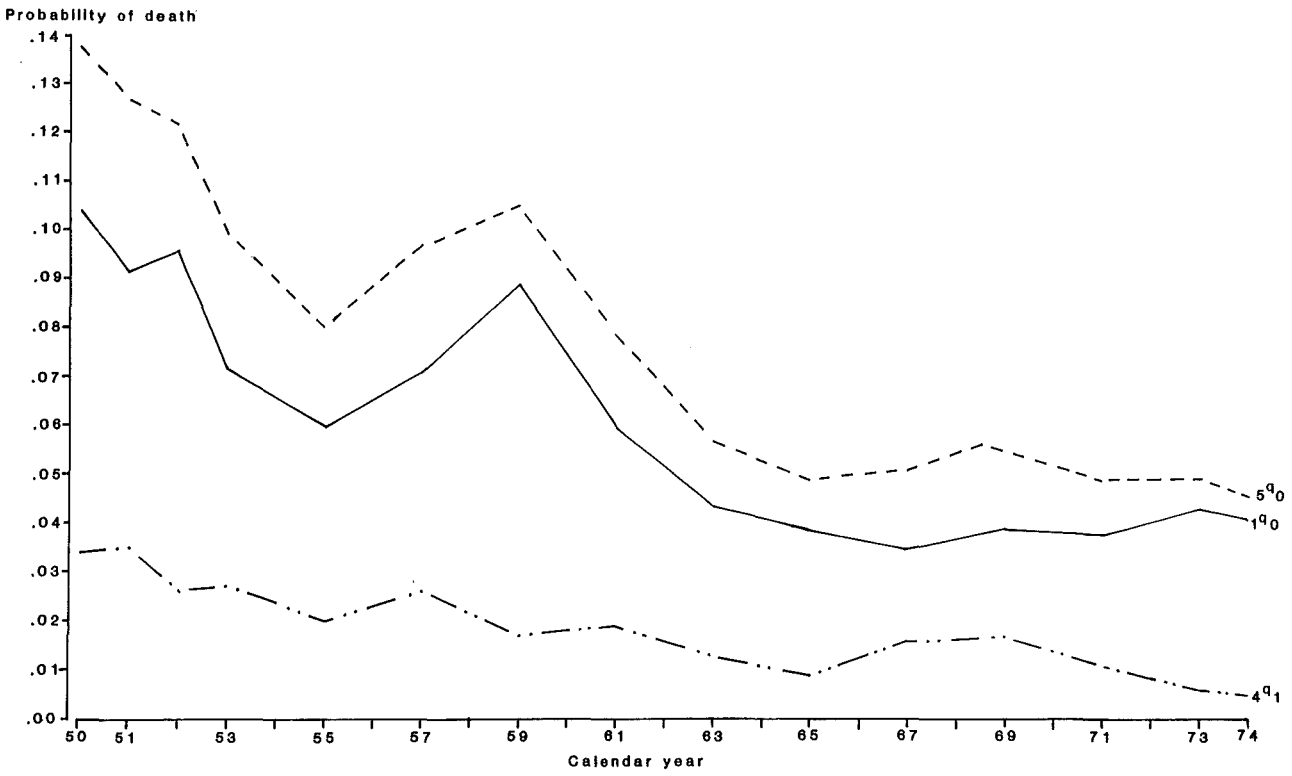

Figure 5 Probabilities (on Three-Year Moving Averages) of Dying within One (${}_1q_0$) and Five (${}_5q_0$) Years of Birth and between One and Five Years (${}_4q_1$) by Calendar Years 1950–74

Table 37 Probability of Dying in the First Year of Life ($_1q_0$) for Periods prior to Survey and by Age Group of Mother at the Time of the Child's Birth

Age group of mother at birth	Years prior to survey						
	Total	1–4	5–9	10–14	15–19	20–24	25–29
10–14	81	(125)	(39)	(35)	(147)	(40)	(111)
15–19	59	35	35	75	59	75	123
20–24	52	46	29	32	91	82	44
25–29	48	38	26	46	67	84	
30–34	58	55	63	53	59		
35–39	53	70	43	53			
40–44	44	(63)	(18)				
45–49	(0)	(0)					
Total	54	46	37	50	74	79	88

NOTE: Values in parenthesis are based on fewer than 100 births.
Source: JFS, 1975–76

After that time the level remained roughly the same, with occasional fluctuations.

Comparison of mortality at periods in the past from survey data may be affected by the differing average age of mothers because the sample is restricted to 15–49 year old women, and age groups are lost as earlier periods are considered. This average decreases steadily as we go further back in time. Infant mortality rates are therefore best compared for comparable ages at motherhood. Table 37 shows these rates for five-year periods prior to the survey by age of mother at the birth of her child. The pattern normally found is a U-shaped one, with higher rates for the oldest and youngest age groups of mothers. Similar patterns have been found in other WFS surveys in Colombia and Dominican Republic, for example (Somoza 1980, Guzmán 1980). This pattern is almost completely absent, however: it is approximated only at the period 10–14 years before the survey. During all other periods, however, the infant mortality rates fluctuate almost randomly, making it impossible to interpret the data. The pattern of declining infant mortality over time may also be expected to occur for each age group of mothers. While this is more or less true among children born to mothers aged 15–19 and 25–29, no pattern occurs among other age groups of mothers – again the fluctuations are almost random. In general, therefore, there appears to be little evidence of omission, and the only apparent error is that seen in the age at death of children 5–9 years before the survey.

Table 38 Proportion of Children Born at least Five Years before the Survey who Died within Five Years of Birth ($_5q_0$), according to Sex, by Period of Birth prior to the Survey

Year prior to survey	Total	Male	Female
5–9	0.053	0.058	0.047
10–14	0.061	0.056	0.067
15–19	0.093	0.104	0.082
20–24	0.102	0.102	0.100
25–29	0.140	0.128	0.153
Total	0.074	0.076	0.072

Source: JFS, 1975–76

Table 38 shows the probabilities of dying in the first five years of life by five-year periods before the survey, for male and female births. There is no suggestion of omission of female births: on the contrary male mortality is lower than female for two of the five-year periods. Clearly if omission occurred it was not consistently higher for any one sex.

Table 39 shows infant mortality rates for education and

Table 39 Probability of Dying within One Year of Birth ($_1q_0$) by Calendar Year Periods, by Subgroups

Group	1971–75	1966–70	1961–65	1956–60	1951–55
All children	0.046	0.038	0.050	0.073	0.077
Area of residence					
Urban	0.044	0.032	0.049	0.064	0.093
Rural	0.047	0.042	0.050	0.079	0.069
Level of education					
Primary: incomplete	0.058	0.036	0.064	0.082	0.089
Primary: complete	0.041	0.044	0.036	0.064	0.060
Secondary or higher	0.035	0.017	0.038	0.048	(0.068)

NOTE: Values in parenthesis are based on less than 100 live births.
Source: JFS, 1975–76

residence subgroups for five-year periods prior to the survey. These differentials suggest that omission of births occurred for particular groups. The rural group for example, normally had higher mortality than the urban from 1956 onwards, but not only had lower mortality in the 1951–55 period but also apparently had a rise in mortality. Although the calendar year rates indicate that there was an epidemic in the late 1950s, it seems unlikely that rural areas only would have suffered from the early to the late 1950s. Neither of these situations is entirely plausible, and this is strong evidence of omission of births at this early period by rural women. Women with four or more years of primary education also had a suspect period of a small rise in infant mortality during the 1950s and again during the 1960s, while all other groups declined. Again the most likely explanations are sampling variation or omission of some infant deaths during these periods by this education group.

7.2 COMPARISON WITH VITAL REGISTRATION

Estimates of the infant mortality rate from the fertility survey are compared with rates derived from national vital registration data for the period 1951–75. JFS estimates are substantially higher than those from vital registration data, especially for the earliest period, 1951–60, although the difference narrows during 1961–65. During 1966–75 there are again substantial differences, suggesting very high under-registration in the five years before the survey. Considering that there was some evidence given earlier suggesting that in the JFS infant deaths were omitted in the period before 1960, it seems likely that the level of under-registration in that earlier period may be even higher than shown in table 40. Finally the JFS data suggests that there was a small increase in infant mortality in the 1971–5 period, while vital registration data shows a continuous decline. The survey data may be overestimating any such rise, however, if there was some error in the age at death during the period 5–9 years before the survey. The general conclusion here is that infant mortality is more completely reported in the JFS than through vital registration.

Table 40 Probability of Dying within One Year of Birth ($_1q_0$) by Calendar Year Periods according to JFS (1975–76) and Vital Registration Data

Period	JFS	Vital registration
1951–55	77	70
1956–60	73	59
1961–65	50	47[a]
1966–70	38	33[b]
1971–75	46	27

[a]Missing one year, 1965.
[b]Missing one year, 1966.
Sources: Tekse, Kalman. (1974). *Population and Vital Statistics in Jamaica 1832–1964*; Jamaica Department of Statistics. (1978). *Demographic Statistics*; JFS, 1975–76

8 Summary

Date reporting in both the household and the individual surveys were in general quite good. Some errors were noted at the household level: the omission of infants; heaping among adults at the digits 0 and 5; the transference of some women aged 49 into age 50; and the possibility of dating error between age groups 30–34 and 35–39. In the individual survey the data are quite reasonable, the only error being that between the 30–34 and 35–39 age groups, which persists from the household to the individual survey. Respondents reported their date of birth and the dates of children's births and deaths with a high degree of completeness, supplying both month and year. Reporting of the date of the first union was not as complete, however: almost half of the total sample gave their age rather than the date of this event, and this proportion was higher for older women.

A direct reading of the JFS nuptiality data shows that a substantial decline of about 2.5 years occurred in the average age at first union. Detailed analysis suggests that older women overstated their ages at first union, however, and this would reduce the size of the real decline from older to younger cohorts by about one year. Evidence of over-statement cannot account for the full observed decline, however, and by implication, it appears that a real decline of about 1.5 years in the average age at first union occurred. Two further important findings are that the survey obtained more complete information on participation in visiting unions than did the census, and secondly, that dating of unions after the first was also somewhat inaccurate in the JFS.

This survey is particularly useful because it provides age-specific fertility data from the period after 1964, which, though usually available from vital statistics, have not so far been published for the period after 1963. Knowledge of fertility trends for the period from the early 1960s onwards is important because a strong family planning programme was instituted during this period (Sinclair 1974b). The results of the JFS, showing substantial decline in fertility beginning from the mid-1960s, contradicts the conclusions drawn from previously existing data (vital statistics of the early 1960s and 1970 census) that almost no change had occurred from 1960 to 1970 (Sinclair 1974b). The maternity histories provide evidence of a substantial decline in fertility during the 10 year period before the survey. The decline of about 1.5 children in the total fertility rate would have resulted from fertility change within unions, since the age at first union actually declined. Fertility decline was concentrated among women aged 30 or more.

The JFS showed a substantially higher level of fertility than the vital statistics from the 1950s up to the early 1960s, the latest date for which age-specific fertility data from vital statistics are available. The implication here is that some under-registration in vital statistics probably existed during this period. Census measures of cumulative fertility are also generally lower than JFS measures for census years, again suggesting that the JFS achieved more complete coverage of children ever born.

There is some evidence that displacement, and to a lesser degree omission, of births occurred among older age groups. The fertility schedules show that there was a rise in fertility among younger women, starting about 30 years before the survey, and continuing up to about 15 years before the survey, while fertility declined during the past 10 years. Although there is evidence supporting the occurrence of some increase in fertility, from both external sources and from the JFS data itself, it seems very likely that only part of the observed 'increase' in fertility is real. At least half is probably due to the combined effects of displacement towards the later part of the reproductive period and of omission of births/infant deaths by older women during the early part of their reproductive life. To the extent that displacement occurred towards the middle and later part of older women's lives, this would coincide with the 1960–75 period, and it would mean that their fertility rates during this period are too high. While the size of the recent decline may be almost the same, even after allowing for the displacement which is spread throughout the 15 year period, the amount of under-registration in the 1960s would probably be less, since the JFS would have slightly over-estimated the level of fertility during the early 1960s.

It is interesting to note that the higher educated groups and urban women experience somewhat larger fertility rises among older cohorts at their younger ages, and perhaps of displacement at older ages, than the lower educated and rural groups. The currently married women had a much smaller increase and therefore less displacement, however, while the currently common law group had an exceptionally large apparent rise in fertility, and presumably displacement was also substantially greater for this group.

Tests of omission of births suggest that some omission of infant deaths may have occurred at periods earlier than 15 years before the survey. Also there is some error in the age at death data in the period 5–9 years before the survey. The JFS showed an overall trend of declining infant and child mortality during the past 30 years, which is confirmed by the trend described in the vital statistics. The level of the infant mortality rate observed in the JFS is consistently higher than the level registered in the vital statistics, however. This suggests that some under-registration of infant deaths existed since the period 30 years before the survey, and continuing up to the present.

In general, the JFS data on age reporting, nuptiality, fertility and infant mortality appear to be reasonably reliable. In particular the union status data, and fertility

and infant and child mortality data from the JFS are more complete than corresponding information from censuses and the vital registration statistics. Reporting errors are mainly restricted to the oldest two cohorts and mostly affect estimates in the periods 20 or more years before the survey, with some slight effects on estimates of fertility levels in the more recent period. Although the existing reporting errors must be taken into account when using the data, this is a rich and useful source of demographic information on Jamaica during the 1950–75 period.

References

Balkaran, S. (1981). Evaluation of the Guyana Fertility Survey 1975. *WFS Scientific Reports* no 26.

Blake J. (1961). *Family Structure in Jamaica.* New York: Free Press of Glencoe.

Brass, W. (1978). Screening Procedures for Detecting Errors in Maternity History Data. WFS Technical Paper no 810 (draft).

Brass, W. (1980). Birth History Analysis. Paper presented at the World Fertility Survey Conference, London.

Brass, W. and A.J. Coale (1968). Methods of Analysis and Estimation. In W. Brass et al, eds. *The Demography of Tropical Africa.* Princeton: Princeton University Press.

Casterline, J.B. and J. Trussell (1980). Age at First Birth. *WFS Comparative Studies* no 15.

Census Research Programme (1976). *Population Census 1970.* Commonwealth Caribbean. Vols 1–8. Jamaica: Univ. of the West Indies.

Chidambaram, V.C., J. Cleland, N. Goldman, and S. Rutstein (1980). An Assessment of the Quality of WFS Demographic Data. Paper presented at the seminar on the analysis of maternity histories. London April 9–11.

Coale, A.J. (1971). Age Patterns of Marriage. *Population Studies 25* (*2*): 193–214.

Coale, A.J. and D.R. McNeil (1972). The Distribution by Age of the Frequency of First Marriage in a Female Cohort. *J. Am. Stastist. Assoc. 67* (*340*): 734–9.

Cumper, G. (1963). Preliminary Analysis of Population Growth and Social Characteristics in Jamaica. *Social and Economic Studies 12* (*4*).

Flórez, C.E. and N. Goldman (1979). An Assessment of Data Quality in the Colombian National Fertility Survey. Paper prepared for Latin American Workshop, World Fertility Survey.

Goldman, N., A.J. Coale and M. Weinstein (1979). The Quality of Data in the Nepal Fertility Survey. *WFS Scientific Reports* no 6.

Goldman, N. and V.C. Chidambaram (1980). A Reinvestigation of the P/F Ratio. WFS Technical Paper no 1429.

Guzmán, J.M. (1980). Evaluation of the Dominican Republic National Fertility Survey. *WFS Scientific Reports* no 14.

Hajnal, J. (1953). Age at Marriage and Proportions Marrying. *Population Studies 7* (*2*): 111–32.

Marino, A. (1970). Family, Fertility and Sex Ratios in the British Caribbean. *Population Studies 24* (*2*).

Mortara, G. (1964). *Characteristics of the Demographic Structure of the American Countries.* Inter-American Statistical Institute, Special Document 4480. Washington: Pan American Union.

Potter, J. (1977a). Problems in Using Birth History Analysis to Estimate Trends in Fertility. *Population Studies 31* (*2*): 335–69.

Potter, J. (1977b). Methods of Detecting Errors in WFS Data: an Application to the Fiji Fertility Survey. *International Population Conference Proceedings*, vol I: 101–22. Mexico City: IUSSP.

Powell, D.L., S.A. Sinclair, L. Hewitt and P. Woo Ming. (1980). *Report on the Study of Fertility, Contraception and Mating in Jamaica.* Working Paper no 19. Jamaica: ISER, Univ. of the West Indies.

Roberts, G.W. (1968). The Present Fertility Position of Jamaica. In Egon Szabady, ed. *World Views on Population Problems.* Budapest.

Roberts, G.W. (1975). *Fertility and Mating in Four West Indian Populations.* Jamaica: ISER, Univ. of the West Indies.

Roberts, G.W. and S.A. Sinclair (1978). *Women in Jamaica.* New York: Kraus-Thomson Organization Press.

Rodríguez, G. and J. Trussell (1980). Maximum Likelihood Estimation of the Parameters of Coale's Model Nuptiality Schedule from Survey Data. *WFS Technical Bulletins* no 7.

Sinclair, S. (1974a). A Fertility Analysis of Jamaica: recent trends with reference to the Parish of St Ann. *Social and Economic Studies 23* (*4*).

Sinclair, S. (1974b). Fertility. In G.W. Roberts, ed. *Recent Population Movements in Jamaica.* Kingston, Jamaica: CICRED.

Singh, S. and R. Lightbourne (1981). Fertility, Union Status and Partners in the WFS Guyana and Jamaica Surveys, 1975–76. Paper presented at IUSSP seminar on Family Structure and Fertility, São Paulo, Brazil.

Smith, David P. (1980). Age at First Marriage. *WFS Comparative Studies* no. 15.

Somoza, J.L. (1980). Illustrative Analysis: Infant and Child Mortality in Colombia. *WFS Scientific Reports* no 10.

Stycos, J.M. and K.W. Back (1964). *The Control of Human Fertility in Jamaica.* Ithaca: Cornell University Press.

Sukhdeo, F. (1973). *Malaria Eradication and Population Growth in Guyana.* University of Guyana.

Tekse, Kalman (1974). *Population and Vital Statistics in Jamaica, 1832–1964.* Kingston, Jamaica: Department of Statistics.