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Evaluation of the Indonesian Fertility Survey 1976

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The WFS is being undertaken, with the collaboration of the United Nations, by the International Statistical Institute in co-operation 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. Substantial support is also provided by the UK Overseas Development Administration.

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BONDAN SUPRAPTILAH

Demographic Institute
Faculty of Economics
University of Indonesia

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

The first such workshop, involving researchers from four Latin American countries, was held between July and October in 1979. The second workshop, with participants from Jordan, Guyana, Indonesia, Malaysia and the Philippines, took place between January and April 1980. The present document reports on the results of the evaluation of the data of the 1976 Indonesia Fertility Survey, and was prepared by Bondan Supraptilah, the participant from that country. Abdullah Abdul-Aziz, Sundat Balkaran, Florentina Reyes and Masitah Mohd. Yatim, the other workshop participants, contributed to the present evaluation through their ideas and discussions.

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

HALVOR GILLE
Project Director

1 Introduction

Accurate information on levels and trends in the demographic characteristics of the Indonesian people has become essential for planners and policy-makers. For this reason the Indonesian government has undertaken three censuses since Independence in 1945 — in 1961, 1971, and 1980 — and sponsored demographic surveys in the 1960s and 1970s. Of special significance among the latter are the Fertility and Mortality Survey of 1973 (1973 F-M Survey), carried out by the Demographic Institute of the University of Indonesia, and the Intercensal Population Survey of 1976, which included as its third phase the Indonesian Fertility Survey (IFS).

The data gathered in the Indonesian Fertility Survey permit estimation of levels and trends in fertility, nuptiality, and infant mortality, as well as providing detail on childbearing preferences, levels of contraceptive use, and other factors related to fertility. Because the IFS was conducted roughly mid-way between the censuses of 1971 and 1980 and seven years after the commencement of the Indonesian government's family planning programme in 1969, it is a valuable resource for use in the estimation of demographic trends during the 1970s and in the assessment of the progress of the familiy planning programme.

The value of the IFS for these purposes depends, however, on the validity of the estimates provided by the survey. Survey data are almost always subject to error arising from several sources: errors in sample design and implementation which result in incomplete coverage of the population; faults in the design of the questionnaire; errors by the interviewers in asking questions and recording responses; inaccuracies in the information supplied by respondents; and, finally, errors in the processing of the data collected. Any one of these types of errors threatens the usefulness of the survey data. Hence, it is critical that the data be examined for evidence of significant errors.

The first objective of the analysis in this report is to examine the IFS data for evidence of errors and biases, specifically those which affect the estimation of basic measures of fertility, nuptiality, and infant mortality. Usually it is not possible to identify the source of apparent errors among the alternatives listed above, unless the survey design has incorporated controlled experimentation which allows the separate sources to be distinguished. In our evaluation of the IFS data, we assume that most of the apparent irregularities result from respondents supplying inaccurate information, as in most instances this is the most plausible explanation. Of particular concern is the misreporting of age or marital duration, misreporting of the dates of vital events, and the omission of vital events, all of which are known to be common in demographic surveys, especially when a large proportion of the respondents are uneducated, as is so in the IFS. Any of these types of response errors may lead to false impressions of the age (and duration) patterns of nuptiality, fertility, and infant and child mortality, as well as historical trends in the same.

A second objective of the analysis is to obtain valid estimates of basic demographic parameters, including age at first marriage, age-specific fertility rates, and infant and child mortality rates.

This report contains a brief background to the survey, followed by chapters on age at the interview, nuptiality, fertility and infant and child mortality.

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2 Background

2.1 THE POPULATION

Indonesia is the fifth most populous country in the world, with a population of approximately 119 million as of the 1971 Census and 147 million as of the 1980 Census. The annual growth rate of the population between the two censuses was 2.5 per cent, which is slightly higher than the 2.1 per cent annual increase in the earlier period 1961–71.

The Indonesian people are not evenly distributed over the five large islands (Java, Sumatra, Kalimantan, Sulawesi and West Irian) and the thousands of smaller islands which make up the national land area. Java, which is the most populous of the islands, contains over three-fifths of the total population but only about seven per cent of the land area, making it one of the most densely populated land areas in the world. At the other extreme, Kalimantan and West Irian contain only five per cent of the population but nearly half of the land area.

As a consequence of high fertility and reduced mortality in recent decades, the age structure of the Indonesian population is weighted towards the younger ages, with 44 per cent of the population in 1971 under age 15. The population is heavily rural – roughly four-fifths reside in rural areas – and agriculture provides the main livelihood for a majority of Indonesians. The level of literacy is low but appears to be rising rapidly. In 1971 57 per cent of the population aged 15 and over were able to read and write, but among those aged 15–24 80 per cent were literate.

Because Indonesia is a nation of thousands of islands, it is not surprising that the population is comprised of more than 300 different ethnic groups speaking roughly 250 different languages. But most of the ethnic and linguistic groups are closely related, and a large majority of the population profess Islam. The national language, Bahasa Indonesia, is now taught to all school children.

Marriage is virtually universal and occurs at a relatively young age, especially for women. At the 1971 Census, nearly 80 per cent of the women aged 20–24 and 98 per cent of those aged 30–34 had married. Estimates of fertility from censuses and surveys prior to the IFS indicated a rather low level (an estimated Total Fertility Rate (TFR) of about 5.5 for the late 1960s), especially for a developing country with, prior to the 1970s, little organised family planning programme efforts. Fertility also shows some regional variation, with the lowest fertility observed in East Java and the highest in West Java. Infant mortality has historically been high (estimated as 145 deaths per 1000 births in the 1950s) and seemed to have declined only slightly by the early 1970s.

2.2 THE SURVEY

The Intercensal Population Survey (abbreviated as SUPAS) conducted in February 1976 was intended to serve as a link between the 1971 and the 1980 population censuses. The SUPAS consisted of three phases. The first phase (SUPAS I) covered almost 250 000 households in all provinces of Indonesia. In this phase, only a simple household listing was collected. A subsample of the SUPAS I households was selected for the second phase, SUPAS II, in which further information on demographic and socio-economic characteristics of households and individuals was gathered. In this phase a limited set of questions on nuptiality and fertility were also asked.

The final phase, SUPAS III, was the Indonesian Fertility Survey (IFS), the subject of this report. The IFS was conducted by the Central Bureau of Statistics, in close co-operation with the National Family Planning Co-ordinating Board. The IFS served as the Indonesian component of the World Fertility Survey, a programme which has been set up within the International Statistical Institute.

Unlike the previous SUPAS phases, the IFS was confined to the islands of Java and Bali, which contained roughly 67 per cent of the national population. The IFS consisted of both a household and an individual survey, the latter limited to ever-married women under 50 years of age. The households for the household survey were a subsample of the SUPAS II households and numbered about 10 500. The household survey interview included a complete listing of all residents of the household (*de jure* and *de facto*) as well as inquiry on a minimal set of characteristics of each resident – age, sex, marital status, and relationship to the head of the household. On the basis of the information collected in the household survey, ever-married women under 50 years of age were identified and selected for the more detailed individual survey interview. (In a departure from a majority of WFS surveys, eligibility for the individual survey was defined on a *de jure* rather than a *de facto* basis. This departure was introduced to facilitate comparison with SUPAS II.) In the household survey 96.7 per cent of the selected households were successfully interviewed. In the individual survey interviews were completed with 96.9 per cent of the selected women, yielding 9155 respondents in total.[1]

[1] The IFS Principal Report (Central Bureau of Statistics 1978) is based on 9136 respondents. Subsequent to publication of the Report, 19 completed individual questionnaires were added to the IFS data-file. It is this updated file which is used in the analyses presented here.

In both surveys the interviews were conducted by female interviewers. In the household survey any adult member of the household was eligible to serve as the respondent for all members of the household. In the individual survey only the selected ever-married women were eligible to serve as respondents. The questionnaires for both surveys were derived from the standard instruments developed by the WFS. The individual survey questionnaire includes sections on the respondent's background (childhood residence, level of educational attainment), her marriage history, her maternity history, her knowledge and use of contraception, her fertility preferences, her employment history, and the background characteristics of her current or most recent husband. Items on abortion and on the availability and use of family planning services were also incorporated in the questionnaire because of special interest in these topics in Indonesia.

A noteworthy feature of the individual survey questionnaire was the use made of an 'events chart' to facilitate the task of dating vital events. The chart is reproduced in appendix A. During the IFS interview, a chart was filled in for each respondent, with the dates of her events (births, marriages) entered as they were obtained, on a scale covering the time period preceding the interview. This graphical representation of the respondent's history was designed to assist the interviewer in recognising implausible or contradictory dating of events and in probing about the dates of specific events with reference to events already dated. A factor complicating the dating of events in Indonesia is the presence of several calendar systems: Muslim/Javanese/Sudanese, Balinese, and Western. IFS interviewers were provided with a conversion table to enable them to convert all dates to a uniform system.

The events chart was designed as a feature of the IFS under the assumption that most IFS respondents would not supply precise calendar dates for most of the relevant vital events in their lives, and the results bear out this expectation, as documented in table 1. Calendar month and year were supplied for a majority of events in only three categories — the current marriage, the first birth, and the last birth — and never were more than 60 per cent of these events dated by month and year. Less than a quarter (22.3 per cent) of the respondents reported a month and year of their own birth. In those cases where a month and year were not supplied, the date has been imputed on the basis of the information which is present. Because of the large amount of imputation required to complete the dating of all events in the IFS, the estimates of year-by-year trends must be treated cautiously.

Table 1 The dating of vital events: percentage of cases with specified information provided

A Respondent's birth and marriage(s)

	Month and year	Year only	Current age or age at event	Number of cases
Birth	22.3	11.2	66.5	9 155
First marriage	45.7	13.0	41.3	9 155
Current marriage	56.1	11.7	32.1	7 972
All marriages	42.8	13.3	43.9	12 820
Dissolution of all marriages[a]	20.3	20.9		4 848

B Live births to respondent

	Month and year	Year only	Months and years ago	Years ago	Number of cases
First birth	50.8	9.4	7.4	32.4	8 023
Penultimate birth	47.8	9.9	7.7	34.5	6 470
Last birth	55.5	8.4	11.0	25.1	8 023
All births	46.5	10.4	8.0	35.0	32 014

[a] 5.3 per cent of marital dissolutions were dated by years since the marriage.
Source: IFS, 1976

An additional component of the IFS was the Indonesia Reliability Study (IRS), which consisted of re-interviews with 498 of the IFS respondents. The questionnaire for the IRS was an abbreviated version of the IFS instrument, with several sections omitted but with the retained questions worded identically as in the IFS. Reconciliation interviews, in which an effort was made to resolve discrepancies between IFS and IRS responses, were conducted with 327 of the 498 IRS respondents. The design of the IRS and a description of the findings are presented in Macdonald, Simpson and Whitfield (1978).

For more detailed discussion of the design and fielding of the IFS and the findings from first-stage analysis, the reader is directed to the IFS Principal Report (Central Bureau of Statistics 1978).

3 Age Reporting

Most demographic measures depend on classification of individuals by age at the time of the survey interview. An obvious example are age-specific fertility rates. Some methods for estimating trends over time also depend critically on accurate reporting of age at the interview. Beyond its entanglement in the calculation of standard demographic measures, the age structure of a population is of interest in itself because of its possible impact on various aspects of a society. For these reasons, it is essential that the accuracy of the reporting of age be evaluated.

Age reporting is evaluated in the IFS in several ways. First we examine the age distributions from both the household and individual survey for unevenness which may be evidence of inaccurate reporting. Preference for ages ending in certain digits is a particular concern. Secondly, we compare the age distribution from the IFS with those from other sources, such as the 1971 Census. Thirdly, we compare the ages reported for the individual survey respondents in the household and individual survey, as discrepancies reveal uncertainty about the correct age. Finally, we examine the quality of reporting in terms of characteristics of the IFS respondents.

The single-year age distribution of the household survey population is shown in figure 1, separately for males and females. The two distributions show irregularities which suggest inaccurate reporting. For example, there is a marked heaping in both distributions at ages ending in the digits 0 or 5, a common phenomenon in demographic data.

In figure 2, we compare the single-year age distribution for females in the IFS with the distribution for females from the 1971 Census. The census distribution shows generally the same pattern (except for the heaping at ages 51 and 52 evident in the IFS), but the heaping is more severe than in the IFS.

The Myers' index provides a summary measure of the extent of digit preference. A higher value of the index indicates greater digit preference. The Myers' indices presented in table 2 support the conclusions from figure 1 and 2. Both sexes show preference for ages ending in digits 0 and 5. The same conclusion applies to the 1971 Census data as well, but the overall levels of heaping are roughly twice as great in the census as in the survey (46.6 and 27.6, respectively). Moreover, in the census the reporting

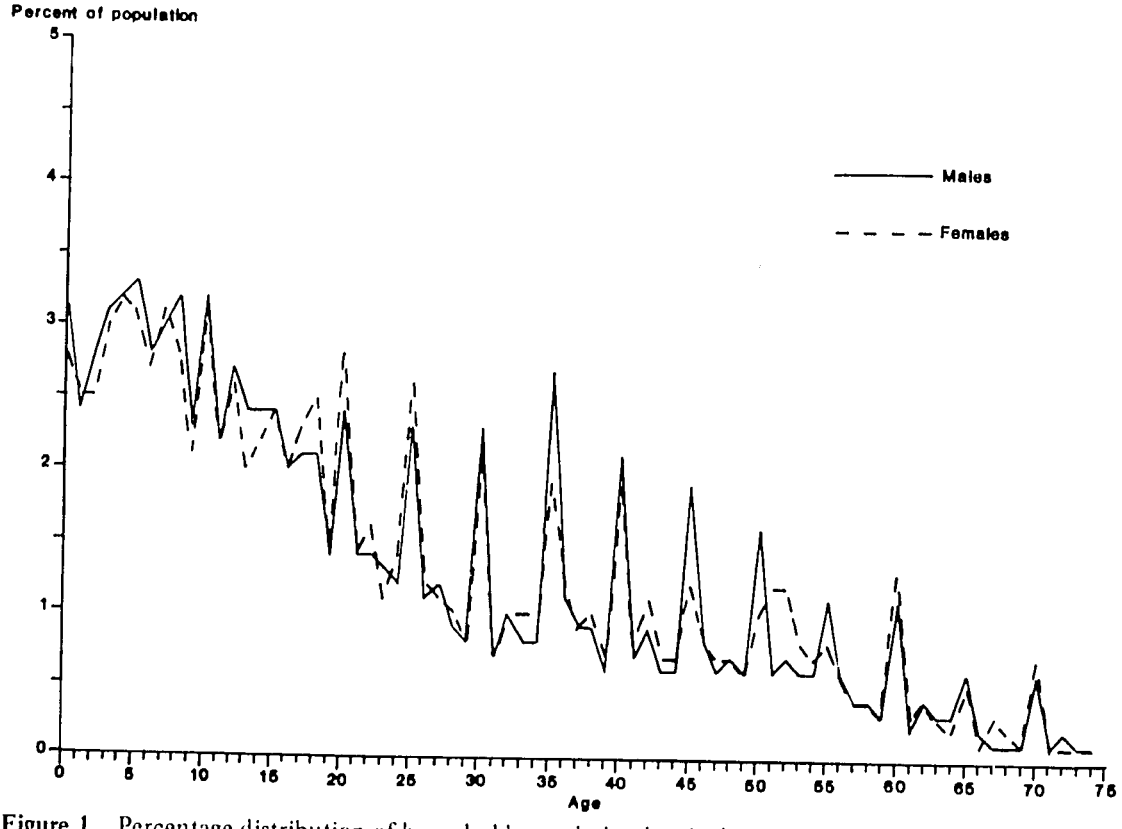

Figure 1 Percentage distribution of household population by single years of age according to sex

Source: IFS 1976

Table 2 Myers' index of digit preference[a] in reports of age, by sex, 1971 Census and 1976 IFS household survey

Digit	Males		Females		Total	
	Census	IFS	Census	IFS	Census	IFS
0	20.6	18.1	24.5	16.8	22.6	18.0
1	6.6	7.0	6.5	8.4	6.5	7.7
2	9.9	9.2	6.5	10.1	8.2	9.6
3	7.4	7.8	9.3	8.0	8.4	7.8
4	4.8	8.0	4.8	8.4	4.8	8.2
5	20.1	17.4	21.4	14.6	20.7	15.9
6	11.3	9.1	7.4	9.2	9.3	9.0
7	6.7	8.4	6.6	8.4	6.7	8.3
8	7.7	8.4	8.1	9.1	7.9	8.7
9	4.9	6.5	5.0	7.0	5.0	6.7
Overall index	44.0	31.1	51.7	23.2	46.6	27.6

[a]The overall index can assume values between 0 and 180. Higher values indicate greater digit preference.

of male ages is less heaped than female ages, while the opposite is the case in the IFS data. This latter finding might be explained by a tendency for females to report for themselves more often in the IFS, because the household survey was followed by the individual survey with ever-married women. The patterns by digit of the blended percentages suggest that the heaping on 0 comes at the expense of ages ending in either 9 or 1 (especially 9), and the heaping on 5 comes at the expense of ages ending in 4 or 6, the former much more than the latter, especially in the census data. That is, the data suggest a tendency to round ages upward to ages ending in digits 0 or 5.

Examination of the grouped age distributions in table 3 reveals other distinctive features of the IFS age distribution. Overall the IFS and the census distributions are compatible, with the exception of female age groups adjacent to age 50 and the age groups under age 20. In the IFS, there is a noticeable deficit of females aged 45–49 which seems to be compensated by an excess of females aged 50–54. That this pattern characterizes females but not males is reflected in the sex ratios shown in the right-hand column of the table. Since age 50 was the upper limit for inclusion in the individual survey, it is plausible that this encouraged the rounding upward above 50 of women aged 45–49. This would explain the odd heaping on ages 51 and 52 evident in figures 1 and 2.

The IFS shows a smaller proportion of the population aged less than 10 and larger proportion aged 10–24. This difference could reflect a decline in fertility over the period preceding the IFS, particularly the prior five years. Under-enumeration of children and errors in the reporting of their ages would also contribute to these differences, however. There is evidence in both the IFS and census data of such problems. In both sources, the sex ratios at ages 0–4 and other young ages (and, indeed, over most ages) are somewhat lower than expected (a sex ratio of 103–106 at birth is usual). This suggests selective omission of male children, or a tendency to 'age' young males (with the excess appearing at ages 10–14). There are, further, some curious patterns within the age group 0–4, as shown in table 4. The census data contain a deficit of males and females aged 0, probably the consequence of under-enumeration, since no excess is evident at ages 1 through 4.

The IFS age distribution is more even within this interval, but the sex ratio changes from 106 to 91 to 107 over the ages 0, 1, and 2, which would seem best explained by a misreporting of males aged 1 as either age 0 or 2. In general,

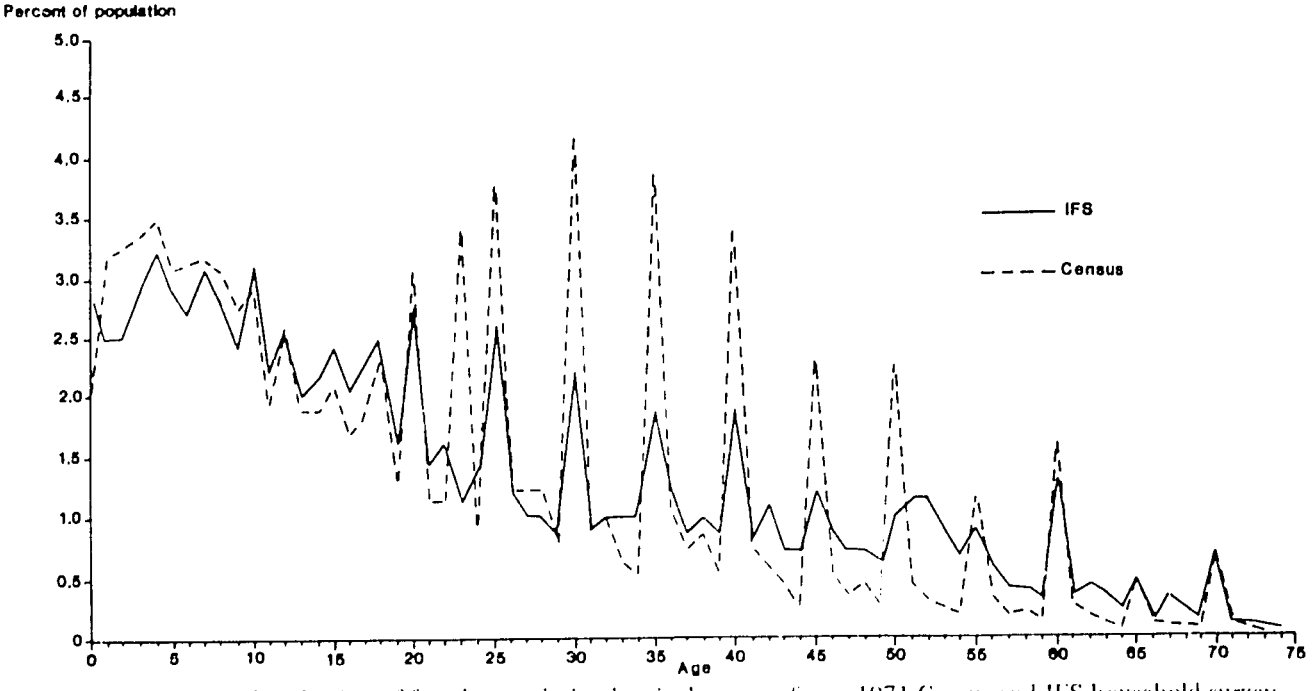

Figure 2 Percentage distribution of female population by single years of age: 1971 Census and IFS household survey

Source: 1971 Census and IFS 1976

Table 3 Age and sex composition, 1971 Census and 1976 IFS household survey

Age	Male		Female		Total		Sex ratio[a]	
	IFS	Census	IFS	Census	IFS	Census	IFS	Census
0	3.1	2.1	2.8	2.0	2.9	2.0	106.8	101.2
1–4	11.5	13.9	11.2	13.3	11.3	13.6	98.7	100.7
5–9	14.6	16.2	14.0	15.1	14.2	15.6	100.5	102.5
10–14	12.9	12.5	12.1	11.1	12.5	11.8	102.8	107.8
15–19	10.0	9.4	10.6	9.2	10.3	9.3	90.5	97.4
20–24	7.7	6.0	8.3	7.2	8.0	6.6	89.2	79.0
25–29	6.1	6.7	6.7	8.3	6.4	7.5	87.9	77.6
30–34	5.7	6.4	6.1	7.3	5.9	6.9	90.1	83.9
35–39	6.2	7.1	6.0	7.1	6.1	7.1	100.5	96.4
40–44	5.0	5.6	5.2	5.3	5.1	5.5	92.5	100.1
45–49	4.8	4.4	4.0	3.9	4.4	4.2	114.2	108.4
50–54	4.0	3.4	4.9	3.4	4.5	3.4	78.8	95.0
55–59	2.9	2.0	2.6	2.0	2.7	2.0	107.4	99.8
60–64	2.3	1.9	2.4	2.2	2.4	2.1	92.3	81.8
65–69	1.2	0.9	1.3	1.0	1.2	1.0	90.3	86.9
70–74	1.1	0.9	1.0	0.9	1.0	0.9	105.1	92.0
75+	1.0	0.6	0.8	0.7	0.9	0.6	102.5	90.3
All	100.0	100.0	100.0	100.0	100.0	100.0	96.4	95.8

[a]Males per 100 females.

Table 4 Single-year age distribution and the sex ratio, ages 0–4, 1971 Census and 1976 IFS household survey

	Age					
	0	1	2	3	4	0–4
Census 1971						
Total	13.0	21.0	21.4	22.0	22.6	100.0
Females	13.0	20.8	21.4	22.0	22.8	100.0
Males	13.0	21.2	21.4	22.0	22.4	100.0
Sex ratio[a]	101.2	103.3	100.8	100.6	99.0	100.8
IFS 1976						
Total	20.5	17.2	18.6	21.2	22.6	100.0
Females	19.9	18.0	18.0	21.0	23.1	100.0
Males	21.2	16.4	19.2	21.3	22.1	100.0
Sex ratio[a]	106.8	91.4	106.8	101.1	95.9	100.3

[a]Males per 100 females.

the IFS data show deficiency at ages 1 and 2, which could be equally well explained by a tendency to round upward the ages of these children or by a recent decline in fertility. The latter possibility is considered in more detail in chapter 5 of this report.

Returning to table 2, we note that the census age structure contains hollows at age groups 20–24 and 30–34 for males and age groups 20–24 and 45–49 for females. Hollows at age groups 20–24 and 30–34 have been interpreted as the consequence of population loss during the Second World War and the Independence War. By this interpretation, similar hollows should be evident in the age groups five years older in the 1976 IFS, but these do not appear. Among males, indeed, a hollow at ages 30–34 is once again present, while the female age structure shows no distinct hollows. This result calls into question the interpretation of the census age structure, which perhaps is more reflective of errors in age reporting than the impact of population losses in the past.

A comparison of the age distribution of women from the household survey with that of a stable population, shown in figure 3, reveals the combined effects of fertility decline, mortality decline and age misreporting on the age distribution. Fertility decline has affected the beginning of the curve (young ages), where there is the same percentage aged 0–4 as aged 5–9, rather than being higher as in the stable model. Mortality decline is evident from the general tendency of the IFS percentages to be above the stable at ages between 5 and 20. Age misreporting has led to the irregularity of the observed data at ages 50–54 (too high) but is also evident at ages 35–39 and 60–64, and is most likely at ages 25–29 (too low).

As many analysts rely on information on age when making comparisons among subgroups of the population, in table 5 we present Myers' indices for selected subgroups of women in the household survey. Digit preference is lower for women residing in urban areas – in all likelihood this is due to higher average levels of education.[2]

Surprisingly, Jakarta, the largest and most modern metropolis in Java and Bali, shows a moderately high Myers' index. Hence it is women in urban areas other than Jakarta whose reporting appears less subject to digit preference bias. Among regions, Central Java is noteworthy for its low index value (9.7) and Bali its extremely high value (51.6). Among language groups, the Javanese show the lowest value (18.0) and Maduranese the highest (61.9).

[2] Oddly enough, the ages of urban women are more heaped on digit 6 than 5, while rural women show the national pattern. This could result from a larger proportion of urban than rural women reporting in terms of calendar year, rather than 'years ago' and a tendency to heap on calendar years terminating in the digit 0.

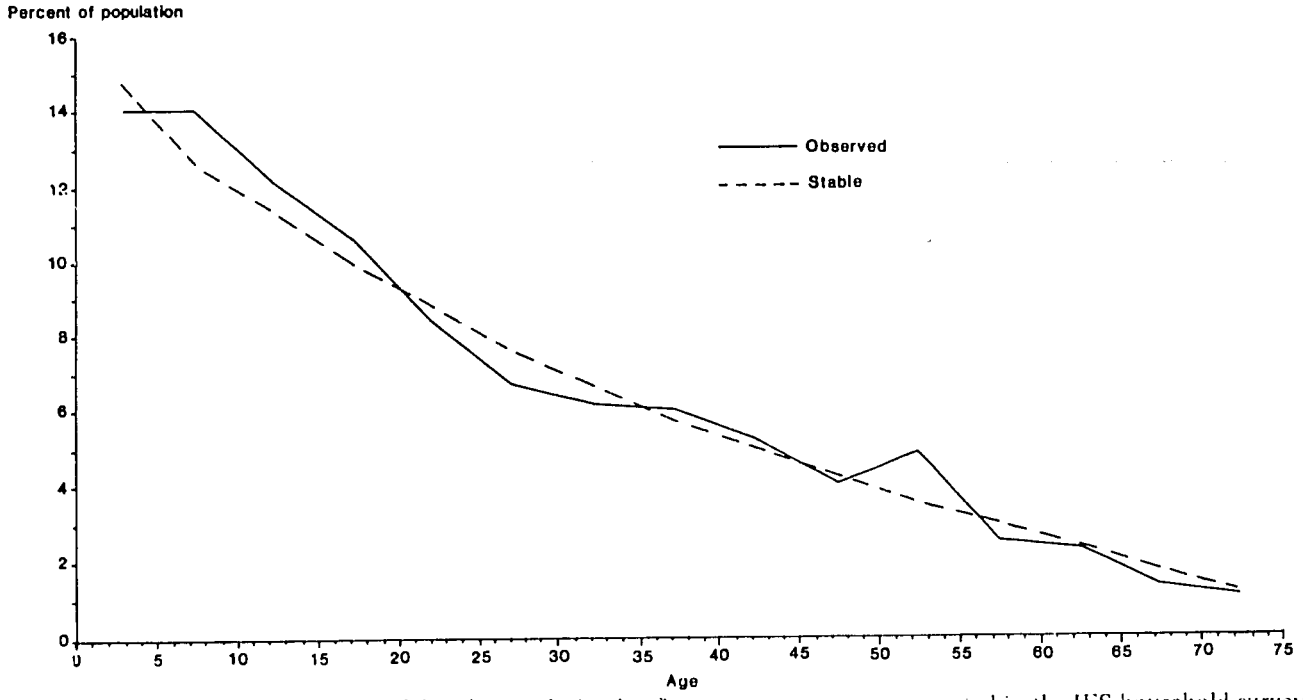

Figure 3 Percentage distribution of female population by five-year age groups, as reported in the IFS household survey, and as fitted by a stable population model

Source: IFS 1976

Table 5 Myers' index of digit preference[a] in reports of age, females, IFS household survey: by place of residence, region, and language of interview

Characteristic	Digit										Overall index
	0	1	2	3	4	5	6	7	8	9	
Place of residence											
Urban	15.1	8.0	8.8	8.8	9.3	8.7	14.2	9.3	8.6	10.1	19.6
Rural	17.2	8.5	10.4	7.7	8.4	14.7	9.1	8.3	8.9	6.8	24.6
Region											
Jakarta	16.2	8.0	8.4	9.1	8.4	14.9	9.1	8.3	10.4	7.2	23.1
West Java	18.5	8.7	9.6	7.2	8.6	15.3	9.3	7.6	9.0	6.3	27.6
Central Java	12.4	10.2	11.3	8.7	10.6	9.9	10.3	9.4	10.0	7.1	9.7
Yogyakarta	17.3	6.8	9.6	8.9	7.9	14.2	8.6	8.3	11.7	6.8	26.3
East Java	18.8	7.0	10.0	7.8	6.5	17.6	8.4	8.3	8.0	7.6	31.9
Bali	24.9	5.6	8.9	5.8	6.6	20.8	5.1	6.8	10.0	5.4	51.6
Language of interview											
Bhs Indonesia	16.3	7.5	10.1	8.2	9.0	13.8	9.1	8.2	10.2	7.5	20.7
Javanese	15.0	8.8	10.8	8.5	8.9	13.2	9.5	8.9	9.7	7.3	18.0
Sundanese	18.5	9.4	9.2	7.5	8.0	15.6	9.3	7.8	8.8	6.0	28.2
Maduranese	26.7	3.6	7.5	4.8	4.4	24.3	6.8	6.6	7.7	7.5	61.9
Balinese	25.2	5.8	9.0	5.9	6.6	21.0	4.9	6.4	9.8	5.4	51.5

[a]The overall index can assume values between 0 and 180. Higher values indicate greater digit preference.

Thus far we have considered the household survey data only. Since the individual survey data provide more information for detailed fertility analysis, the remainder of this chapter is devoted to an assessment of the reporting of age in this survey.

The household and individual surveys interviews were intended to be independent. Indeed, in the household survey an individual's age need not have been supplied by that individual, whereas in the individual survey the woman reported for herself. The percentages in table 6 indicate that the ages reported in the two surveys are not always in agreement. Roughly 80 per cent of the ages are the same in the two surveys, with the 20 per cent discrepant cases evenly divided between positive and negative age differences (upper panel). In only about 7 per cent of the cases does the discrepancy entail assignment to a different five-year age group, and the differences amount in almost all of these cases to one age group (lower panel). The patterns

Table 6 Differences in the reporting of age in the household and the individual surveys, IFS 1976

Difference[a] in years	Total	Age group						
		<20	20–24	25–29	30–34	35–39	40–44	45–49
−3+	1.4	2.1	1.0	0.5	1.8	2.2	1.4	0.5
−2	1.0	1.6	1.5	0.7	1.5	0.3	0.7	0.3
−1	7.3	14.3	10.7	8.6	4.9	5.1	3.9	3.4
0	80.8	75.7	75.4	80.0	82.6	82.2	85.5	85.2
1	6.3	5.3	8.5	7.7	6.4	6.0	3.8	4.4
2	1.0	0.5	1.7	1.3	0.9	0.9	1.0	0.6
3+	2.3	0.5	1.1	1.2	2.0	3.4	3.6	5.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Difference[a] in age groups	Total	Age group						
		<20	20–24	25–29	30–34	35–39	40–44	45–49
−3+	0.1	0	0.1	0.1	0.3	0	0	0
−2	0.2	0.2	0.2	0	0.3	0.5	0	0
−1	3.6	10.0	4.4	3.0	3.2	2.4	2.8	0
0	93.4	89.8	93.1	94.4	94.0	93.3	93.5	94.6
1	2.3	0	2.2	2.5	2.0	3.3	2.9	3.0
2	0.3	0	0	0	0.2	0.4	0.6	1.6
3+	0.1	0	0	0	0	0	0.2	0.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[a]Age in the household survey minus age in the individual survey.

of differences by age groups reveal no strong tendency towards discrepancy in one direction, once the constraints imposed by upper age limits (in the individual survey) and the implausibility of very young ages (for ever-married women) are taken into account.

The level of agreement between the household and individual survey age reports is far greater than between the individual survey and the Indonesia Reliability Study, which entailed a re-interview roughly four months after the IFS. In the IRS, only 43 per cent of the respondents reported the same age as in the IFS individual survey, and in 12 per cent of the cases the discrepancy was five years or more (MacDonald *et al* 1978).

We have already implied that some of the discrepancy evident in table 6 may be the consequence of the individual survey respondent not reporting for herself in the household survey. Discrepancy may also have arisen because the inquiry about age was more elaborate in the individual survey: the respondent was first asked to supply the year of her birth and, failing to do so, only then asked her age. As indicated in table 1, roughly one-third of the respondents were able to supply a year of birth. The distribution of year of birth for these women is shown in figure 4, and some heaping on certain dates is apparent. For example, a disproportionate number of women report 1951 as their year of birth; these women would be 25 years old at the time of the survey, which may explain the heaping on that date. 1942 and 1945 were years of memorable events in Indonesia – the Japanese occupation and Independence – and thus the heaping on these dates is hardly surprising. As a comparison, the age distribution for the two-thirds of the individual survey respondents who could only supply an age is shown in figure 5. The pattern of heaping is quite similar to that evident in figures 1 and 2 for the household survey, with heaping on ages ending in digit 0 and 5 most noticeable, along with a lesser tendency to choose ages divisible by two. The heaping in the individual survey appears to be slightly less than in the household survey.

The subgroup differentials in digit preference evident in the household survey data are repeated in the individual survey data, as indicated by the Myers' indices presented in table 7. The ages of urban women are less heaped than those of rural women, and the heaping is least for women in Central Java and greatest for women in Bali. The bottom two panels of the table confirm our expectation that age reporting of literate women and women with more schooling is less subject to digit preference. The findings of the Indonesia Reliability Study also suggest that better educated women report age more accurately (MacDonald *et al* 1978).

To sum up, our analysis indicates that the information on age is subject to substantial effects of misreporting. Most evident is a tendency to supply ages ending in certain digits, although this tendency is less evident than in the 1971 Census data. It appears that a large proportion of women aged 45–49 were reported as aged 50 or above in the household survey. Several features of the age structure of children are suspicious, a matter to which we return when assessing the fertility data (chapter 5). The ages reported in the household and individual surveys are the same for the majority of respondents. There is a greater consistency between them than is found in the ages reported in the individual survey and in the Indonesia Reliability Study.

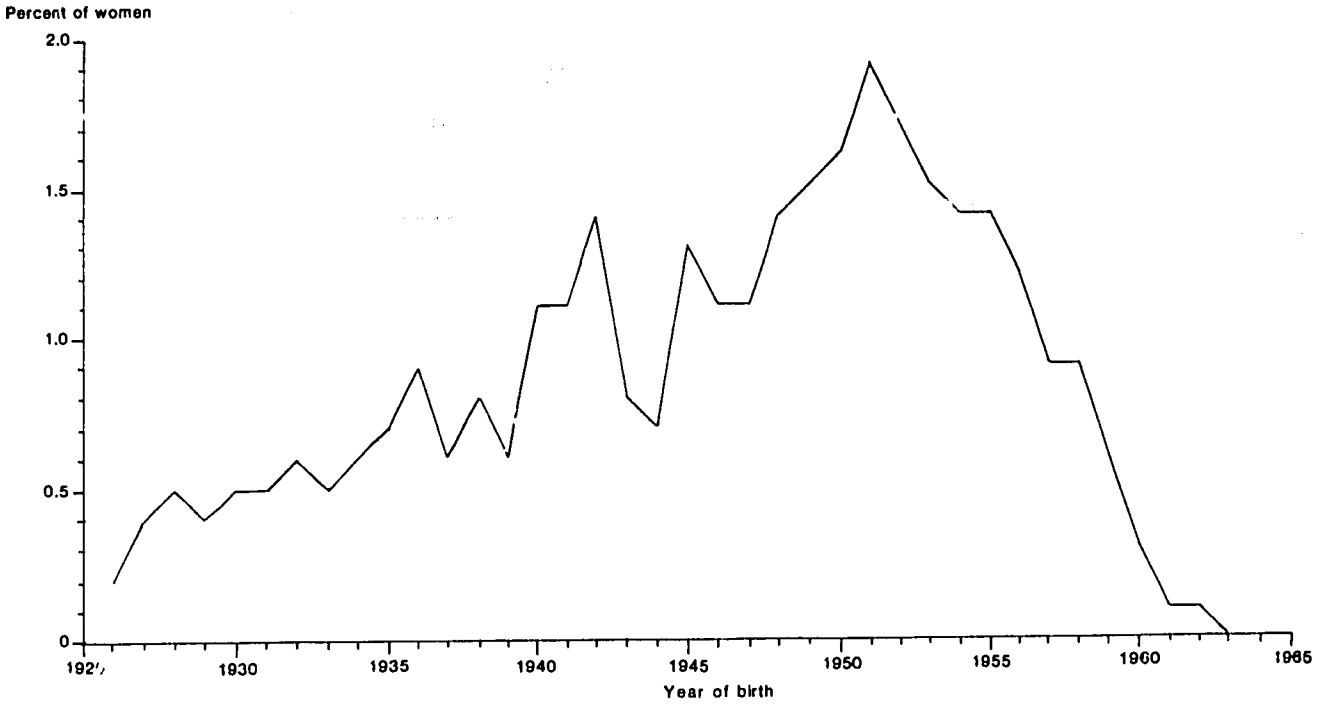

Figure 4 Percentage distribution by year of birth of ever-married women who reported their year of birth

Source: IFS 1976

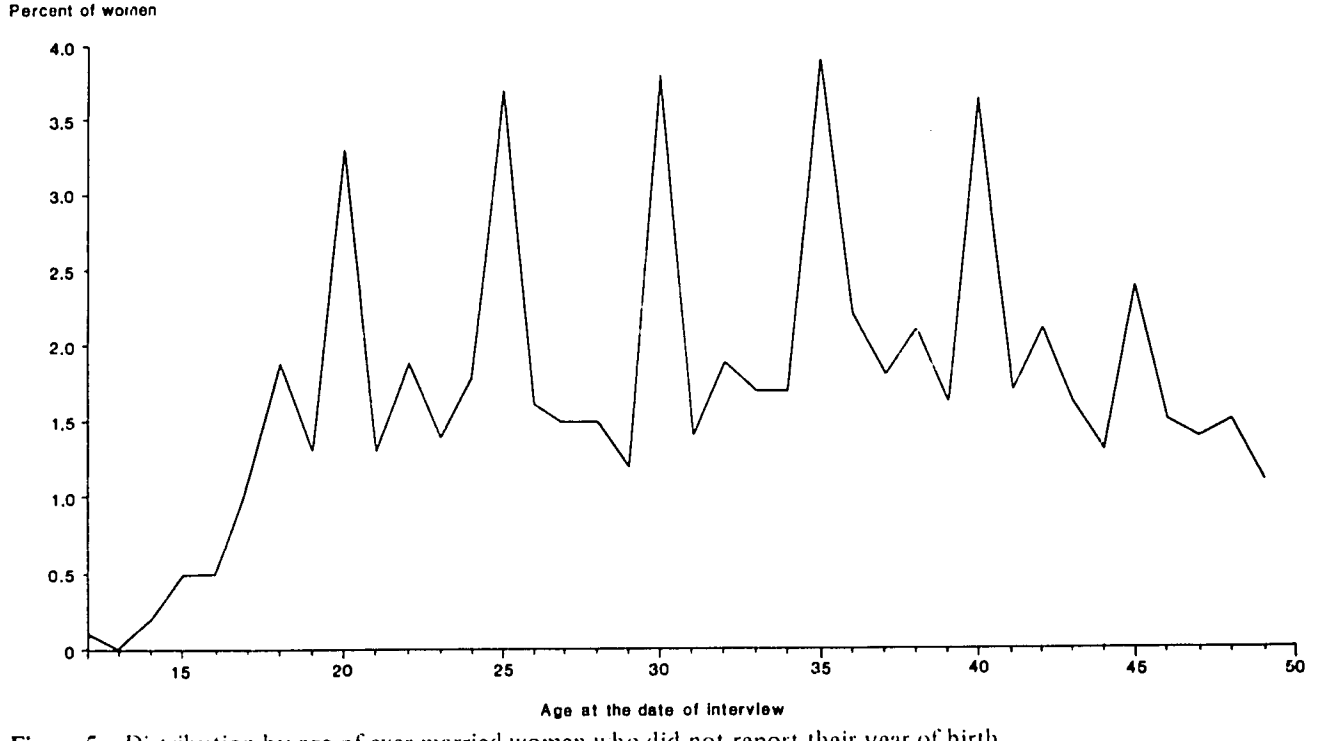

Figure 5 Distribution by age of ever-married women who did not report their year of birth

Source: IFS 1976

Table 7 Myers' index of digit preference[a] in reports of age, IFS individual survey: by place of residence, region, literacy, and level of educational attainment

Characteristic	Digit										Overall index
	0	1	2	3	4	5	6	7	8	9	
Place of residence											
Urban	11.4	7.1	9.0	9.6	9.5	14.2	10.0	10.0	10.4	8.9	12.0
Rural	14.0	7.4	9.0	8.2	8.7	15.5	10.5	9.0	8.9	8.9	20.0
Region											
Jakarta	13.2	9.7	8.6	12.5	9.9	14.3	9.9	10.0	10.5	7.2	15.1
West Java	12.5	8.5	7.6	8.6	9.7	15.9	11.6	8.6	8.6	8.6	20.0
Central Java	10.8	9.1	10.3	10.3	11.3	9.3	11.0	10.4	10.1	8.4	8.5
Yogyakarta	14.3	6.9	8.3	10.2	8.2	13.2	9.0	9.6	12.4	7.9	20.1
East Java	17.4	6.3	9.7	7.0	6.4	14.9	10.0	9.1	8.6	10.6	25.7
Bali	19.8	5.0	7.4	5.6	9.1	24.2	6.0	5.3	10.4	7.3	48.9
Literacy											
Can read	12.2	7.5	8.8	9.6	9.6	14.2	10.8	9.0	9.1	9.2	16.2
Cannot read	14.4	7.2	9.1	7.7	8.4	16.0	10.2	9.3	9.1	8.7	21.2
Educational attainment											
None	14.4	7.1	8.8	8.0	8.4	15.3	10.3	9.3	9.0	8.9	21.0
Not completed primary	12.8	7.4	9.3	8.3	9.8	16.2	10.4	8.4	8.7	8.6	18.9
Completed primary	11.5	8.5	9.7	11.4	10.2	11.4	9.6	9.4	9.0	9.3	14.4
High school or greater	8.7	7.5	8.8	10.8	8.9	11.1	13.4	10.1	11.5	9.0	14.0

[a]The overall index can assume values between 0 and 180. Higher values include greater digit preferences.

4 Nuptiality

The nuptiality data in the IFS consist of information on marital status obtained in both the household and the individual surveys, as well as the detailed marriage history gathered in the individual survey. In the marriage history, the respondent was asked the date of the beginning of each marriage (or, if the date was not known, age at the time of the marriage) and, for marriages which had dissolved, the duration of the marriage and the date of dissolution.

The quality of the IFS nuptiality data is evaluated by several means:

1 The consistency of the reporting of marital status in the household and individual survey is examined.
2 Marital status distributions in the past, reconstructed from the IFS marriage history data, are compared with the marital status distributions from the 1971 Census and the 1973 Fertility and Mortality Survey.
3 The IFS individual survey marriage data are examined for evidence of internal irregularities, in particular heaping on certain ages or dates and implausible trends over cohorts.

4.1 CONSISTENCY OF THE DATA IN THE HOUSEHOLD AND INDIVIDUAL SURVEYS

In chapter 3 we noted discrepancies between the household and individual surveys in the reporting of the respondent's age. Similar discrepancies emerge in the reporting of marital status, although the discrepancies are of less magnitude, as indicated in table 8. Since only ever-married women are selected from the household survey for the individual survey, and since the inquiry in the individual survey presumes ever-married status, the possibility of a woman changing her report from ever- to never-married is effectively ruled out. Roughly 85 per cent of the ever-married women in the household survey were reported as currently married, and essentially 100 per cent of these women report themselves as currently married in the individual survey. Only among those women identified in the household survey as widowed are reporting discrepancies evident: in the individual survey, 17 per cent of these women are recorded as divorced and 3 per cent as separated, rather than widowed. As the individual survey contained more detailed probing about the outcome of previous marriages, this discrepancy is comprehensible: widowhood is a more socially acceptable basis for dissolution and hence is supplied in the household survey, while more probing in the individual survey draws out a different (and probably valid) response. The level of consistency in reporting divorced and separated statuses suggests little preference for reporting one over the other.

Overall, the reporting of marital status is very consistent between the surveys. A similar level of consistency emerged in the IRS, where the percentage of women reporting discrepant marital statuses in the IFS and the re-interview was only 2.4 (MacDonald *et al* 1978).

4.2 COMPARISONS WITH OTHER DATA

Using the IFS marriage history data it is possible to reconstruct marital status distributions for dates in the past. In table 9 the reconstructed percentages of women ever-married, by age, at the time of the 1971 Census and the 1973 Fertility and Mortality Survey are compared with the distributions obtained from those two sources. The percentages shown by the IFS are consistent with the other sources at older ages, especially ages 30 and above. At the younger ages, the IFS data show higher percentages ever-married. The IFS excess is greater in the comparison with the 1973 F-M Survey data and in this case extends through women aged 25–29, while the inconsistency with the 1971 Census pertains only to women aged 15–19. The difference at ages 15–19 between the IFS and the

Table 8 Marital status distribution of ever-married women in the household survey, by marital status reported in the individual survey: IFS 1976

Household survey	Individual survey					Number of women
	Married	Widowed	Divorced	Separated	Total (%)	
Married	99.8	0.1	0.0	0.1	100.0	7900
Widowed	0.5	79.0	17.2	3.3	100.0	563
Divorced	0.0	2.7	95.6	1.7	100.0	522
Separated	0.0	0.0	2.9	97.1	100.0	170
Number of women	7884	466	603	202	9155	

Source: IFS 1976

Table 9 Percentage of women ever married, by age, at the dates of the 1971 Census and the 1973 Fertility-Mortality Survey, according to the 1971 Census, the 1973 Fertility-Mortality Survey, and the IFS 1976

Age group	At 1971 Census		At 1973 F-M Survey		IFS 1976
	Census	IFS	F-M Survey[a]	IFS	
15–19	43.0	47.9	30.3	45.6	37.9
20–24	85.2	85.9	82.1	85.3	79.9
25–29	96.3	96.2	93.5	96.0	94.9
30–34	98.3	97.9	98.6	97.9	98.0
35–39	98.8	99.1	99.2	98.8	98.5
40–44	98.9	99.3	99.0	99.3	99.2
45–49	99.9		99.3		99.3

[a]Excludes DKI Jakarta, Yogyakarta, and urban Bali.
Sources: 1971 Population Census, Series E
Preliminary Report of the Indonesian Fertility-Mortality Survey, 1973
IFS 1976

1973 F-M Survey seems largely due to errors in the 1973 data, as the figure of 30.3 per cent is substantially lower than estimates from other recent sources. But the IFS estimate for this youngest age group is also higher than the census estimate.

There are several possible explanations for the differences at the younger ages. One is that young ever-married women were selectively omitted from the 1971 Census and the 1973 F-M Survey but later included in the IFS. As selective omission of never-married women seems more likely, this explanation is not persuasive. A second explanation is that younger women in the IFS pushed their dates of marriage away from the survey date (or reported ages at marriage younger than their actual ages). A third explanation is that the percentages ever-married shown in the 1971 Census and 1973 F-M Survey are too low, for one of two reasons. Over-statement of the age of young ever-married women is thought to be common (Ewbank 1981). For example, ever-married women aged 18 or 19 may be reported as age 20, especially if they have borne one or more children. If this error occurred relatively more frequently in the earlier sources than in the IFS, it could account for the observed discrepancies. Alternatively, the percentage ever-married may be underestimated in the earlier two sources because of a tendency to report young ever-married women who are divorced or separated as never-married. The level of marital dissolution among women under age 20 is unusually high in Indonesia (see the IFS Principal Report, volume I, table 4.4).

Because the estimated percentages ever-married at younger ages differ between the IFS and the other sources, the nuptiality trends implicit in the IFS data differ from those that can be derived from comparing these other sources over time (1971 Census, 1973 F-M Survey, 1976 IFS). This is an important matter to which we return later in this chapter.

While the percentages in table 9 suggest consistency between the three data sources with respect to marital status at the older ages, the more detailed breakdown presented in table 10 provides a different picture. At ages

Table 10 Percentage of women currently married, widowed and divorced, by five-year age groups, at the date of the 1971 Census and the 1973 Fertility-Mortality Survey, according to the 1971 Census, the 1973 Fertility-Mortality Survey, and the IFS 1976

Age group	At the 1971 Census		At F-M Survey 1973		IFS 1976
	1971 Census	IFS	F-M Survey	IFS	
A Percentage currently married					
15–19	36.3	43.4	27.6	41.1	31.0
20–24	75.2	79.2	76.5	78.6	72.3
25–29	86.9	88.3	87.7	88.3	84.4
30–34	87.1	91.1	91.4	88.5	87.2
35–39	83.4	86.5	89.9	85.8	85.8
40–44	74.6	79.3	85.8	80.1	80.4
45–49	67.2	79.5	81.3	78.0	74.4
B Percentage widowed					
15–19	1.7	0.5	0.5	0.3	1.2
20–24	3.3	0.7	1.2	0.8	1.6
25–29	4.1	2.0	2.1	1.8	3.2
30–34	6.4	2.3	3.6	3.9	4.4
35–39	10.6	5.9	5.7	6.4	6.6
40–44	19.2	12.4	9.4	10.8	11.9
45–49	27.2	16.5	14.6	15.8	17.9
C Percentage divorced[a]					
15–19	5.0	4.1	2.2	3.9	3.4
20–24	6.7	6.1	4.4	5.2	4.7
25–29	5.3	6.0	3.7	5.3	5.7
30–34	4.8	4.4	4.0	5.1	4.8
35–39	4.9	6.7	3.6	5.9	4.4
40–44	5.1	7.6	3.8	6.2	5.0
45–49	4.9	4.0	3.4	5.7	5.9

[a]IFS percentages pertain to separated as well as divorced women.
Sources: see table 9

45–49, the census shows a far lower percentage of women currently married and a higher percentage widowed than the IFS. In fact, the percentages widowed in the census data are higher at all ages, with the difference at ages 45–49 only the most dramatic. Were these differences the consequence of selective omission of widowed women from the IFS, we would expect differences in the overall percentages ever-married. As these latter percentages are roughly the same (table 9), the differences must arise from differences in the marital status distribution of the ever-married.

We noted, when discussing table 8, a tendency of women to report themselves as widowed when apparently they were actually divorced or separated. Such a tendency among the census respondents would explain the higher percentages widowed in the census data, but the same tendency should yield a correspondingly lower percentage divorced or separated. The figures in table 10 only weakly support this expectation. Rather, the lower percentage widowed in the IFS is compensated for primarily by a higher percentage currently married. This suggests that

the discrepancy may arise from a misreporting in the IFS of the timing of marital dissolution in the past.

Arguing against this view is the general consistency between the 1973 distributions from the F-M Survey and the IFS, and the differences between the 1971 Census and 1973 F-M Survey marital status distributions. These considerations lead to doubt about the validity of the 1971 Census data. On the other hand, McDonald, Yasin and Jones (1976) conclude that the F-M Survey systematically under-enumerated widowed and divorced women and thus the 1971 Census marital status distribution is probably more valid. A final relevant bit of evidence is that the IFS marital status distribution for 1976 shows 17.9 per cent of the ever-married women aged 45–49 widowed and 35.8 per cent aged 50–54 widowed, a suspiciously large increase which suggests selective over-statement of the age of widowed women in the IFS.

In sum, the marital status distributions for women aged 30 and over are not consistent among the three data sources considered here. We are not able to reconcile the differences, but the higher level of agreement between the IFS and the 1973 F-M Survey than between the 1971 Census and either Survey suggests that the IFS data are more trustworthy than the census data. Even so, it seems unwise to use the IFS data to reconstruct past distributions of marital status within the ever-married state. The discrepancies with other sources are disturbing, and, furthermore, the reconstruction depends on accurate reporting of the timing of dissolution, which itself is problematic because the moment of dissolution is not always well-defined when dissolution results from causes other than death of the spouse.

4.3 INTERNAL EVALUATION OF THE INDIVIDUAL SURVEY DATA

Slightly more than half (58.7 per cent) of the IFS individual survey respondents supplied a calendar date – a year, or a month and year – for first marriage (see table 1). The remainder supplied an age at first marriage. The percentage of current marriages with a calendar date supplied is higher, 67.8 per cent, whereas for all marriages the percentage with a calendar date supplied is 56.1 per cent. Thus a substantial proportion of marriages of any type are subject to biases in the reporting of either dates or ages.

In figure 6 the distribution of first marriages by calendar year is displayed, separately for urban and rural women. Both distributions show some heaping on years ending in 0 or 5, although the tendency is slighter than observed in the year of birth distribution (figure 4). The heaping is more pronounced for urban than rural women (but the sample sizes are smaller – and the sampling errors larger – for urban areas.) In appendix B, table B1 shows the percentages ever-married by age group according to urban-rural residence, region and language. The results will not be discussed.

Figure 7 shows the distribution of first marriages by years since the marriage, again separately for urban and rural women. Once more a tendency to heap on years ending in 0 or 5 – in this instance years since the event rather than calendar years – is evident. Because the interviewing for the IFS occurred in early 1976, the tendency to misreport either calendar years or years since the marriage as a year ending in the digits 0 or 5 will result, in most cases, in a similar pattern of heaping on specific dates or

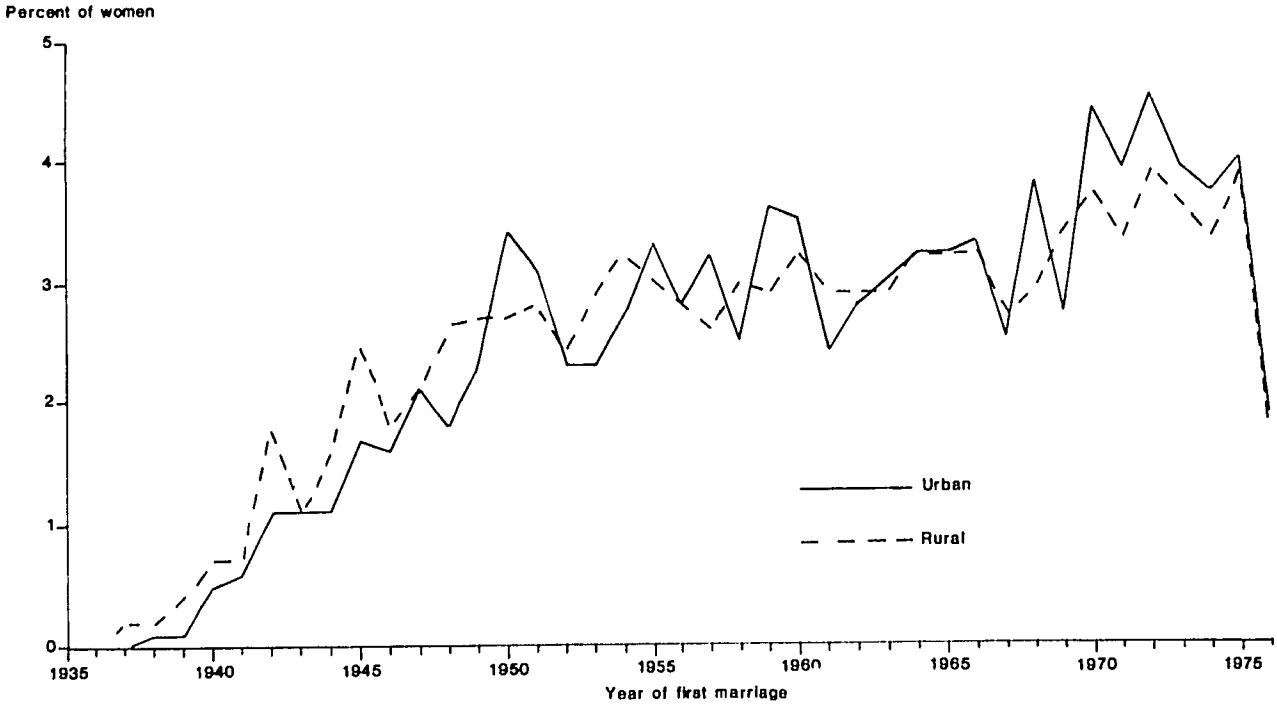

Figure 6 Distribution of ever-married women aged 15–49, by year of first marriage and place of residence

Source: IFS 1976

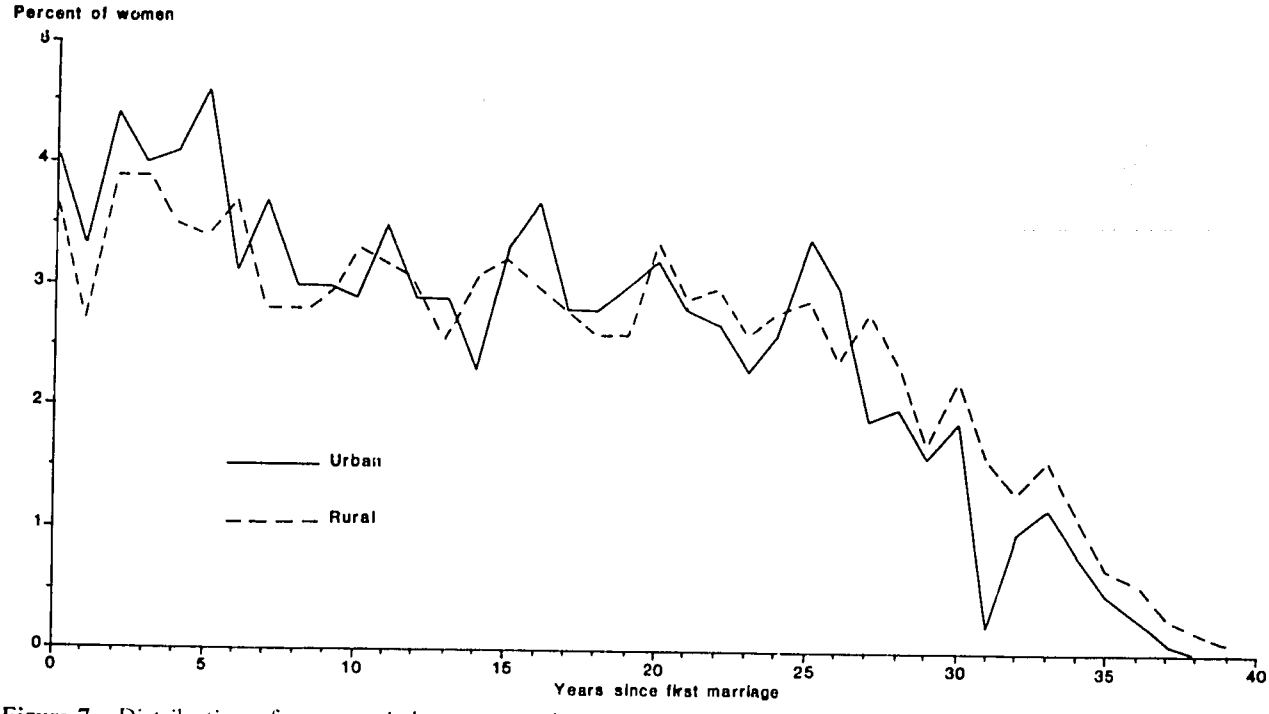

Figure 7 Distribution of ever-married women aged 15–49, by years since first marriage and place of residence

Source: IFS 1976

marital durations. The distributions in figure 7 also show an unusual dip at one year prior to the survey, which appears to be the consequence of reporting some marriages which occurred one completed year prior to the survey as having occurred two years prior to the survey.

A further insight into the validity of the age at marriage data is provided by the Indonesia Reliability Study. When age at marriage is calculated from either reported year of marriage or age at marriage, 62.5 per cent of the re-interviewed respondents reported a different age at marriage in the two interviews (a higher level of discrepancy than in the reporting of age). The responses of those women who supplied a year of marriage were discrepant in only 24.4 per cent of the cases, but the responses of 75 per cent of those women who supplied an age at marriage were discrepant. The consistency of response in the two interviews is positively associated with level of educational attainment (MacDonald *et al* 1978).

4.4 TRENDS IN AGE AT FIRST MARRIAGE

The trends in age at first marriage estimated from the IFS data provide a further basis for assessing the quality of the IFS data, as well as being of substantive interest in their own right. The IFS Principal Report summarizes trends in age at first marriage (chapter 4). Here we consider more critically the validity of the estimated trends.

The percentages of women ever married, by age, as of the survey date and for years prior to the survey, are presented in table 11. In this table, the sequence of percentages on the diagonals, read from upper right to lower left, represent the cohort experience of women aged 10–14 to 45–49 at the time of the survey. Reading across the rows from right to left we observe the historical trend in percentages ever-married at specific ages. In general,

Table 11 Percentage of women ever married, by age group: by years prior to the survey

Age at specific date		Years before the survey							
		0	5	10	15	20	25	30	35
10	14	1.5	3.6	8.7	12.9	16.9	17.5	17.5	15.6
15	19	32.2	46.7	57.9	63.1	65.4	66.2	65.8	
20	24	79.3	86.7	89.7	91.8	92.5	90.9		
25	29	94.5	96.3	96.7	97.5	97.0			
30	34	97.9	98.0	98.7	98.5				
35	39	98.6	99.0	98.8					
40	44	99.2	99.3						
45	49	99.3							

Source: IFS 1976

at ages below 30 these percentages fall as we approach the survey date. The decline is particularly large at ages 15–19 in the ten years prior to the survey, indicating a significant rise in the age at first marriage in this period. The change in the nuptiality behaviour of the more recent birth cohorts is more clearly evident in the cohort single-year cumulative first marriage distributions shown in figure 8. The first cohort to diverge markedly from the pattern of the older cohorts is the cohort aged 20–24 at the time of the IFS.

The patterns across cohorts and (implicit) ages evident in table 11 are plausible, with the exception of the slightly lower percentages of the cohort aged 45–49 married at the younger ages relative to the cohort aged 40–44. (At ages 20–24, for example, the percentages are 92.5 and 90.9, respectively.) The implied older average age at first marriage for the oldest women may be valid: these women attained age 15 between 1941 and 1945, a period of disruption in

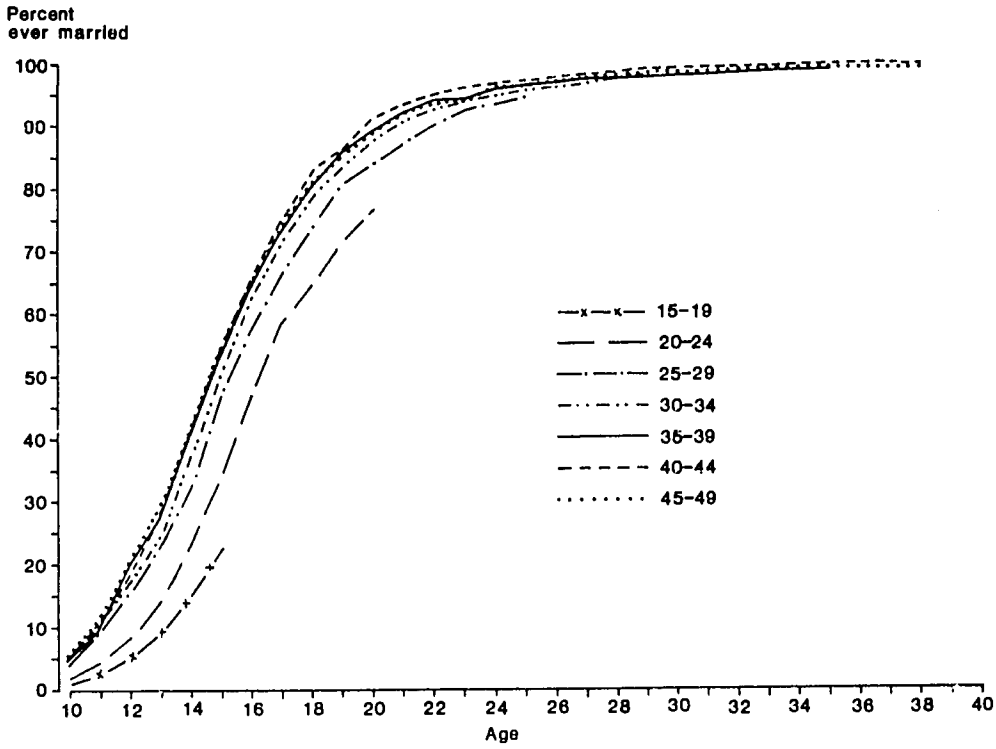

Figure 8 Percentage ever married, by age, by age group at survey (cohort)

Source: IFS 1976

Indonesian society as a consequence of the Japanese occupation and the Independence movement. If the differential is not valid, it may appear for several reasons: a tendency for the oldest women to bring forward towards the survey their date of first marriage; a tendency for the oldest women to report the date of higher-order rather than the first marriage; or, finally, a tendency for the oldest women to exaggerate their current age but report their date of first marriage accurately, so that their implied age at marriage is too high. The figures in table 12 indicate that a substantial minority of the older women report a first birth prior to first marriage. This suggests unreliability of the dating of either first birth or first marriage, and is consistent with the hypothesis that older women displaced forward the date of first marriage or reported the date of higher-order marriage. A smaller percentage of the women aged 45–49 than those aged 40–44 report the first birth prior to first marriage, however, which suggests that the differential between these cohorts evident in table 11 cannot be explained in this way. A further explanation is that women reported as aged 45–49 in the household survey are selective of those who married later, perhaps because this was associated with lower achieved parity. Interestingly, a tendency for the women aged 40–44 to show a lower age at first marriage than women aged 45–49 is apparent in many WFS surveys (Chidambaram, Cleland and Verma 1980).

It is of interest to consider the implications for the cohort nuptiality experiences of the changes across cohorts at the younger ages evident in table 11 and figure 8. The first marriage experience of the younger cohorts is incomplete at the survey, truncated at the current age of the cohort. In order to obtain estimates which correspond to the complete cohort experience, we have fitted the Coale nuptiality model to the reported proportions ever married by age for each cohort. (See Coale and McNeil 1972.) The fitted model provides estimates of the mean age at first marriage and of the proportion eventually marrying by exact age 50. The results are presented in table 13. We have fitted the model with an estimate of the proportion eventually marrying (C) obtained from the fitting (left-hand estimates) and with the proportion eventually marrying fixed at 0.99 for all cohorts (right-hand estimates). When C is not fixed, the estimates of both the mean and C for the youngest cohort are not plausible. When it is assumed that 99 per cent of the women in all cohorts will eventually marry, the estimates of the mean show a gradual rise over the older cohorts and a steeper rise (essentially one full year for each cohort) over the three youngest cohorts. These estimates emphasize once again the striking recent nuptiality changes implicit in the IFS marriage history data.

Table 12 Percentage of women reporting date of first birth prior to date of first marriage, and mean number of marriages, by age

Age group	Percentage with first birth prior to marriage	Mean number of marriages
15–19	3.1	1.14
20–24	7.3	1.27
25–29	10.9	1.42
30–34	17.9	1.54
35–39	18.9	1.63
40–44	21.0	1.66
45–49	19.0	1.75

Source: IFS 1976

Table 13 Mean age at first marriage and proportion ever marrying, by age group at survey, estimated using the Coale nuptiality model

Age group	C[a] Estimated		C[a] Fixed	
	Mean	C[a]	Mean	C[b]
15–19	23.1	1.92	19.4	0.99
20–24	18.0	0.93	18.5	0.99
25–29	17.5	0.98	17.6	0.99
30–34	17.0	0.98	17.1	0.99
35–39	16.9	0.99	16.9	0.99
40–44	16.7	0.99	16.7	0.99
45–49	16.9	0.99	16.8	0.99

[a]C is the expected proportion ever marrying by age 50.
[b]The p-values on the chi-squared goodness-of-fit statistic are as follows for the separate cohorts, when C is estimated rather than fixed.

Cohort	*P-value*
15–19	.202
20–24	.003
25–29	.001
30–34	.009
35–39	.011
40–44	.033
45–49	.206

(A small p-value indicates a poor fit. Values under .05 might be taken as indicative of an unacceptable fit.)
Source: IFS 1976, restricted to women marrying at ages 12 and above

The validity of the trends estimated from the IFS data is the major matter to assess here. Our analysis of the internal consistency of the IFS data suggests that the data are generally of high quality, with the exception of a preference for reporting dates of marriage ending in certain digits and an apparent tendency for the oldest women to displace forwards their date of first marriage. If the IFS data show too large a decline in the percentages ever married at the youngest ages in the decade preceding the survey, the most obvious source of such an error would be a displacement backwards in time of the date of first marriage of young women in the IFS. It does not seem likely that this occurred sufficiently often to explain the steep decline observed. Moreover, such displacement backwards runs counter to the dating errors of the oldest respondents.

We are left, uncomfortably, unable to resolve the discrepancy between the trends implicit in the IFS data and the trends estimated when drawing on other sources in conjunction with the IFS. The discrepancy is of some significance. Consider table 9 once again. At the youngest age group (ages 15–19) – which encompasses most of the first marriages and hence is most reflective of changes in the timing of first marriage – the IFS shows a decline of ten percentages points from 1971–1976, whereas the difference between the 1971 Census and the 1976 IFS figures is five percentage points. Trends at other ages, however, are for the most part the same whether the IFS data alone are used or in combination with the 1971 Census data. (The 1973 F-M Survey data pose further problems.) We conclude that entrance into first marriage is increasingly postponed by women in Indonesia, but the magnitude of recent changes remains a matter of doubt.

5 Fertility

A principal objective of the Indonesian Fertility Survey was to provide estimates of levels and trends in fertiiity. Particular care was taken to devise a set of questions and interviewing procedures which would yield accurate data on the number of children ever born and dates of the births. The total number of births was obtained by a sequence of questions eliciting separately the number alive and deceased, the former classified by sex and residence in the household. Following this, the interviewer continued into the detailed maternity history, ascertaining for each birth – beginning with the first birth and referring to each child by name – the date of birth, sex, and survivorship status (and date of death, if applicable). The date was asked as the calendar year and month of birth, but if this could not be obtained the interviewer requested the duration in completed years and months since the birth occurred (effectively the age of the child, if still living, although the question was not phrased as such). As indicated in table 1, respondents were able to supply a year of birth for 57.9 per cent of all live births (and for most of these a month was supplied as well). The remaining births were dated by the duration since the birth. More recent births (last births) and first births were more often dated in terms of calendar dates than all births (table 1).

The fertility information collected is subject to several types of errors which damage the estimation of both levels and trends. Omission of live births threatens the estimates of levels and, if associated with date of the births (relative to the survey date, for example), the estimates of trends as well. Incorrect dating of births biases estimates of trends. In this chapter, we examine the IFS data for evidence of omission or incorrect dating of live births. As in previous chapters, the validity of the data is assessed through internal consistency checks and comparisions with external sources of data.

Table 14 Mean number of children ever born per ever-married woman, by age group, at the dates of the 1971 Census, the 1973 Fertility-Mortality Survey, and the IFS 1976: reconstructed from the IFS maternity history and as reported in the census and survey

Age group	At 1971 Census		At 1973 F-M Survey		IFS 1976
	Census	IFS	F-M Survey[a]	IFS	
15–19	0.5	0.7	0.6	0.7	0.6
20–24	1.6	1.7	1.5	1.7	1.6
25–29	2.8	3.1	2.8	3.1	2.8
30–34	3.8	4.1	3.9	4.2	4.0
35–39	4.3	4.9	4.6	4.9	4.8
40–44	4.3	5.1	4.9	5.2	5.3
45–49	4.2	–	4.6	5.3	5.2

[a]Excludes DKI Jakarta, Yogyakarta, and urban Bali.
Sources: see table 9

5.1 CUMULATIVE FERTILITY

The mean number of children ever born to five-year age groups are presented in table 14. The means are calculated for the survey date and as of the dates of the 1971 Census and the 1973 F-M Survey, with the means from those two sources also shown for comparision. Considering first the IFS figures for 1976 (as at the survey), we note that the means increase with age group, as expected if marital fertility has been stable or declining and age at marriage has been unchanging or rising. The exception to this rule is the slightly lower cumulative fertility reported by women aged 45–49 (5.2 live births, compared to 5.3 for women aged 40–44). This pattern is apparent in the 1973 F-M Survey (McDonald *et al* 1976) and has been observed in WFS surveys in other countries as well (Chidambaram *et al* 1980). This pattern can be viewed as an indication of the omission of live births by the oldest women. The pattern could also result from misreporting of current age associated with parity: for example, if women of relatively higher parity were more likely to be misreported as over age 50 rather than aged 45–49 in the household survey.

A more detailed view is provided in figure 9, which shows the cumulation of births by age for each cohort. Here it appears that the profile for women aged 40–44 as well as the profile for the oldest cohort diverges from the almost identical profiles of the other cohorts. Unless fertility at the early ages has been rising over cohorts, the divergence would seem to be the consequence of under-estimation of the average parity of older women, resulting either from omission of births or from age misreporting associated with parity.

The Indonesia Reliability Study provides grounds for doubting the validity of the fertility information provided by the older respondents: inconsistent reporting of the number of children ever born rises from 15.8 per cent of respondents aged 35–39 to 29.7 per cent and 33.9 per cent of respondents aged 40–44 and 45–49 respectively (MacDonald *et al* 1978).

In the comparisons with the 1971 Census and the 1973 F-M Survey, the IFS data consistently show higher mean numbers of children ever born. The IFS figures exceed the 1973 F-M Survey figures by less than one-half a child at all ages except 45–49; the IFS figures exceed the 1971 Census figures by more than one-half a child at ages above 35.

There are two potential explanations for the discrepancies. The first is that reporting is more complete in the IFS than in the other sources. The second is that some births

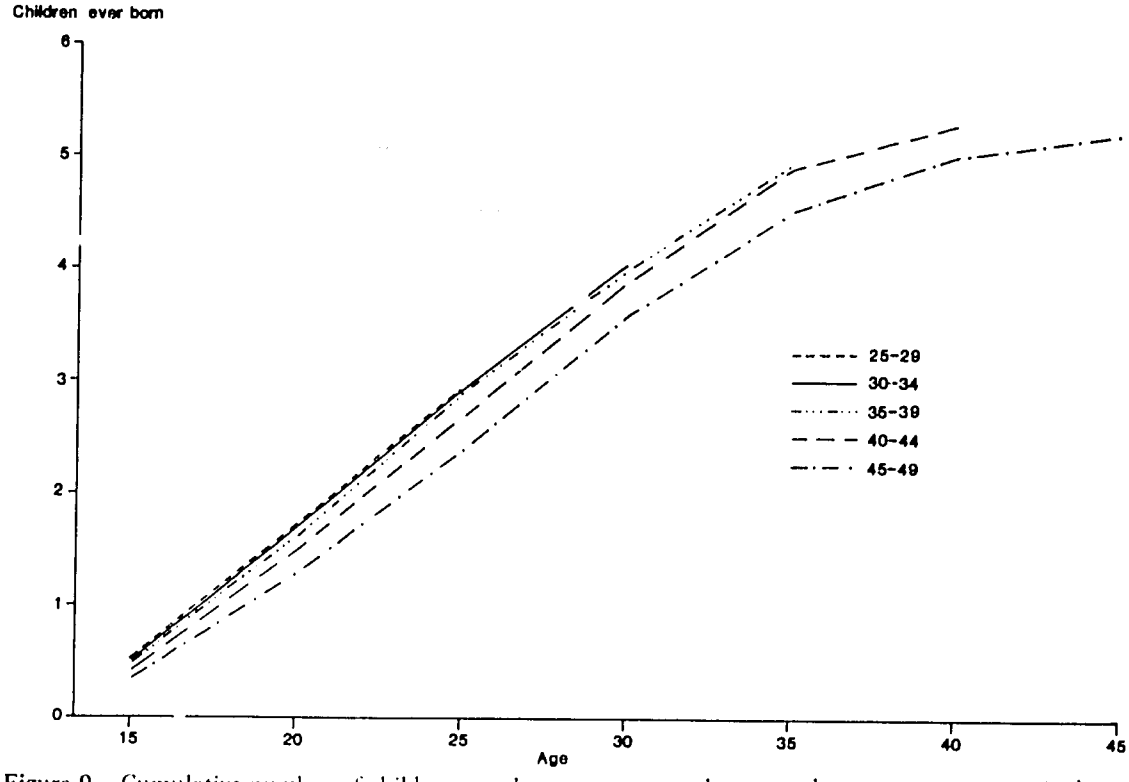

Figure 9 Cumulative number of children ever born per woman, by age and age group at survey (cohort)

Source: IFS 1976

Table 15 Age-specific fertility rates by calendar year

Year	Age-specific fertility rate[a]							Total fertility rate[b]
	15–19	20–24	25–29	30–34	35–39	40–44	45–49	
1950	162	252						
1951	149	234						
1952	151	231						
1953	168	238	223					
1954	161	252	222					
1955	200	264	237					
1956	158	242	258					
1957	164	268	254					
1958	185	241	238	229				5.76
1959	100	255	249	242				5.92
1960	189	259	246	220				5.86
1961	170	298	246	199				5.86
1962	164	234	232	191				5.40
1963	188	268	255	210				5.90
1964	148	274	231	197	168			5.53
1965	182	257	268	212	174			5.90
1966	126	267	237	229	136			5.42
1967	154	265	260	232	155			5.77
1968	156	252	256	185	145			5.42
1969	155	249	244	214	138			5.44
1970	151	275	254	204	142	76		5.61
1971	140	283	263	206	138	62		5.56
1972	132	258	241	202	142	52		5.23
1973	127	244	219	160	125	62		4.78
1974	105	205	192	137	93	41	16	3.95
1975	136	254	210	144	92	46	24	4.53

[a]Live births per 1000 woman years exposure.
[b]For the years with an incomplete set of age-specific rates, the TFR has been estimated using age-specific rates for the two last calendar years for which information is available.

Figure 10 Total fertility rate by calendar year 1958–75

Source: IFS 1976

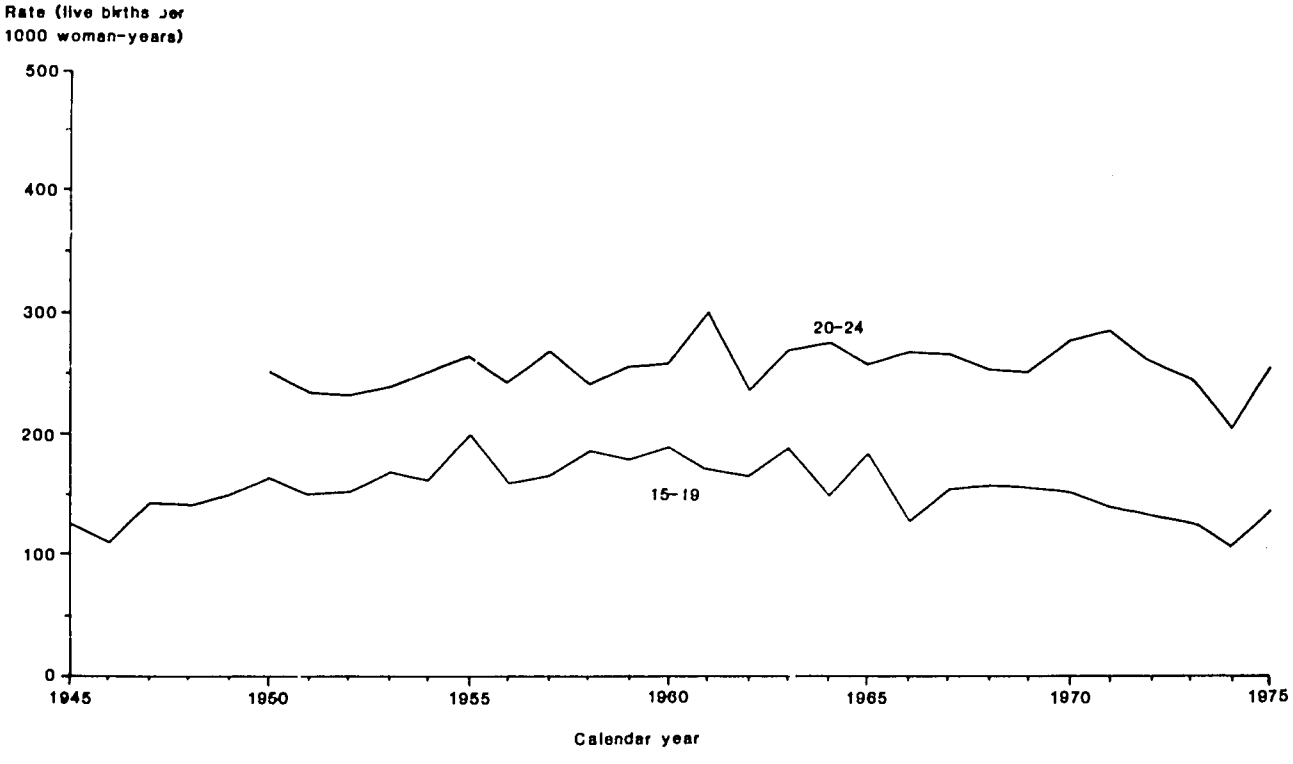

Figure 11 Age-specific fertility rates, women aged 15–19 and 20–24, by calendar year

Source: table 15

reported in the IFS have been incorrectly dated as occurring before 1973 or 1971 – that is, displaced backwards in time. Our analysis below of the IFS estimates of trends in fertility gives no indication of displacement of such severity as to explain the large differences evident in table 14. Hence we conclude that the reporting of live births in the IFS is more complete than in the 1971 Census and the 1973 F-M Survey, despite the internal evidence of the underestimation of the parity of older women.

5.2 AGE-SPECIFIC FERTILITY RATES BY CALENDAR YEAR

Age-specific fertility rates and the total fertility rate (TFR) calculated for each calendar year from 1950 through 1975 from the IFS maternity history data are presented in table 15. The TFRs are plotted in figure 10, and the age-specific rates in figures 11 and 12. The numerator for the age-specific rates, ie the number of births, is obtained from the

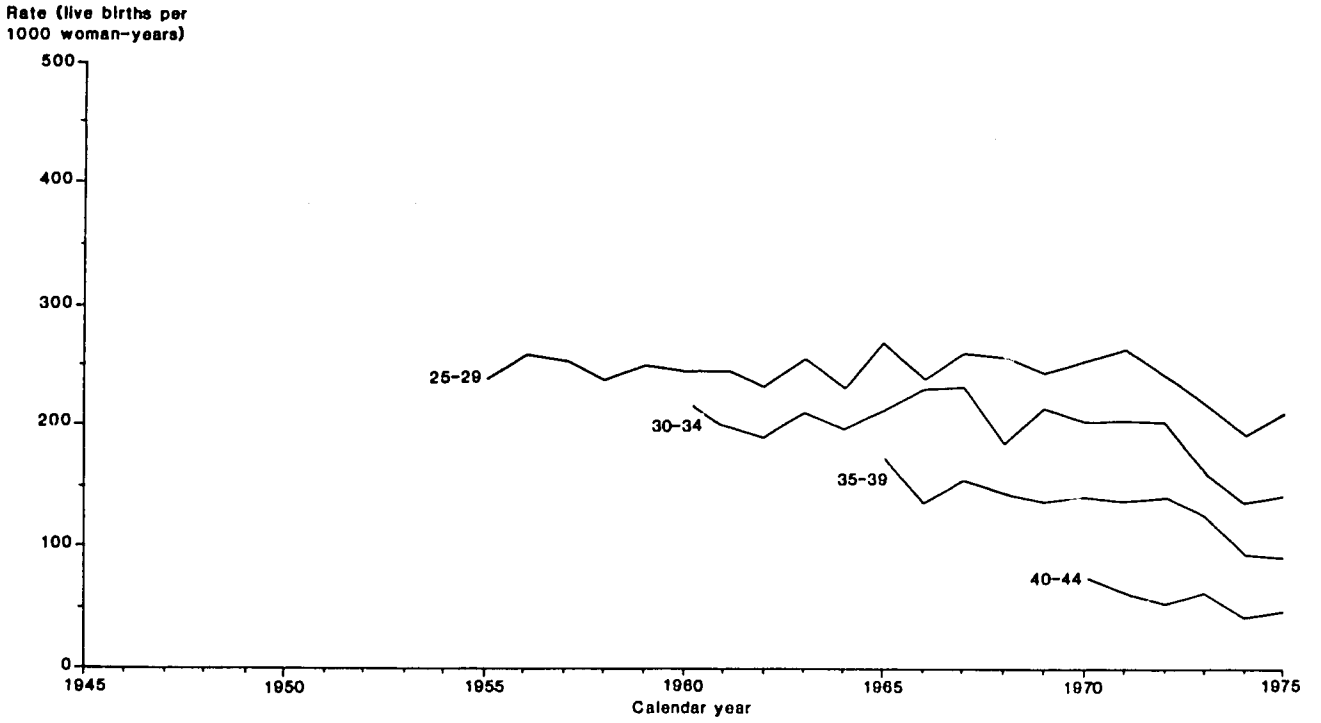

Figure 12 Age-specific fertility rates, women aged 25–44, by calendar year

Source: table 15

cross-tabulation of births by year of occurrence and the age of mother at the birth. The denominator is the total number of women-years of exposure at each age in each calendar year for the ever-married women in the individual survey, inflated by the proportion ever married in the household survey.[3] (Never-married women are assumed to be nulliparous.)

Since fertility estimates for the older ages become more truncated for successive calendar years in the past, the TFRs have been estimated replacing the missing age-specific rates with the average of the rates for the last two years for which data are available. (Note that if fertility has declined among the older women, this procedure leads to an underestimate of the decline in the total fertility rate.)

The main outline of the trends in the IFS data are evident in figure 10. Fertility fluctuates in the period before 1971, but is on the whole unchanging in level, and then declines in the five-year period preceding the survey (showing a peculiar dip in 1974). This pattern is replicated at all ages, with the decline between 1971 and 1976 somewhat sharper at ages 25 through 39 and the dip in 1974 more pronounced below age 30 (especially at ages 20–24) (figures 11 and 12).

The slight decline in age-specific rates below age 25 follows from the rising age at marriage during this period evident in the IFS data (see chapter 4). We note, without further elaboration, that the dip in 1974 does not seem acceptable and is probably the consequence of moving births from this year to adjacent years, 1975 in particular. It could also result from a general tendency to displace backwards in time the births of all young children except the very youngest (those under one year), a possibility which is consistent with the deficit at age 1 evident in the household survey age structure (see table 4). We consider this explanation in a more general context below. A similar dip in fertility in the period one to two years prior to the survey is shown by the 1973 F-M Survey maternity history data (McDonald *et al* 1976).

Our first priority is to assess the validity of the estimated fertility decline in the five years preceding the survey. Such a decline, if genuine and the commencement of persistent fertility change, would be of great significance to planners the policy-makers in Indonesia. Since the government family-planning programme, inaugurated in 1969, gained momentum in the early 1970s, the onset of fertility change coincident with the programme efforts reflects on their success.

External sources of data for the period 1971–6 are limited, and hence our evaluation relies principally on internal checks. We begin, however, with a comparison of the IFS fertility rates with those from other sources in the decade preceding the survey.

Total fertility rates for several periods between 1967 and 1975, as estimated from the IFS and other sources, are shown in table 16, along with the corresponding age-specific rates from all but one source. Since fertility rates from vital registration data are not available, we utilize indirect estimates from the 1971 Census and the SUPAS I and direct estimates from the maternity history data of the 1973 F-M Survey. The own children method used in obtaining several of the estimates is essentially a reverse survival method which depends on full coverage of young children, choice of the appropriate set of child mortality rates, and correct

[3] The rates in table 10 are not identical to those shown in table 6.10 of the Principal Report. The rates in table 10 have been calculated by a more exact procedure than those in the Principal Report and thus are the preferred set of rates.

Table 16 Total fertility rates and age-specific fertility rates for 1967–71 and 1971–5, from the IFS maternity history data and other sources

Period and source	TFR	Age-specific rates						
		15–19	20–24	25–29	30–34	35–39	40–44	45–49
1967–71								
IFS 1976	5.6	151	265	256	208	143	69	.
1971 Census (own children)	5.3	162	275	256	192	110	48	14
F-M Survey 1973[a]	5.3							
SUPAS I 1976 (own children)	5.2	145	256	255	191	127	54	21
1971–5								
IFS 1976	4.8	128	249	225	170	118	53	20
SUPAS I 1976 (own children)	4.9	130	254	240	183	106	51	16

[a]Calculated from maternity history data, using proportions married estimated for 1968 from 1971 Census data with adjustments for trends in marital status composition. Excludes DKI Jakarta, urban Yogyakarta, and urban Bali.
Sources: IFS 1976
Terence H. Hull, Valerie Hull and Masri Singarimbun (1977). Indonesia's Family Planning Story: Success and Challenge. *Population Bulletin 32 (6)*, 42–3.
Sam Suharto and Lee Jay Cho (1978). *Preliminary Estimates of Indonesian Fertility Based on the 1976 Intercensal Population Survey*. East-West Population Institute, East-West Center, Paper no 52, table 2, p 10

accounting for the effects of mortality of childbearing women and of children residing apart from their mothers.

As indicated in table 16, the TFR calculated from the IFS maternity history data for the period 1967–71 is 0.3–0.5 points higher than the TFRs from the other sources. The TFR differences arise chiefly from differences in age-specific rates at ages 30 and above. The differences would not appear to be due to the level of child mortality assumed in the own children calculations, as the 1971 Census data yield mortality rates higher than those estimated from the IFS, which should have the effect of elevating the census own children estimates of fertility relative to the IFS estimates. The differences could result from a pushing backwards in time of births reported in the IFS. The trend shown in figure 10 shows no heaping in the late 1960s indicating such a bias in the reporting. This possibility bears so importantly on the validity of the IFS trend, however, that we return to it in more detailed analysis later in this chapter. A final source of the difference could be insufficient accounting in the own children estimates for the mortality of childbearing mothers and the separation of young children from their mothers, which in combination can have noticeable impact on the estimates (see, eg Hobcraft 1980).

Since maternity history data were gathered in the 1973 F-M Survey, trends can be estimated from these data and compared with the IFS trends, recognizing that the IFS data generally show higher absolute levels. The F-M Survey data show a sharp decline in fertility in the three years prior to the survey, that is, commencing after 1969 (McDonald *et al* 1976). This decline anticipates the decline shown in the IFS data by two calendar years. McDonald *et al* conclude, after considering a wide range of explanations, that most of the estimated decline was probably not genuine, instead the result of over-statement of the age of young children and the omission of young children. The IFS findings encourage reconsideration of this sceptical viewpoint. For the purposes of evaluating the IFS data, it is difficult to know what to make of the trends shown by the F-M Survey. An onset of fertility decline around 1970 characterizes both sets of data. However, the two-year discrepancy in the timing of the onset suggests dating errors in one or both sources. Satisfactory reconciliation of the two sets of maternity history data is beyond the province of this report.

The IFS estimates for the period 1971–5 agree quite well with the only other estimates available, those from application of the own children method to the SUPAS I data.

5.3 DETAILED ANALYSIS OF COHORT AND PERIOD RATES

Our analysis thus far suggests that the coverage of births in the IFS is more complete than in other recent data sources and that the estimated decline in fertility through the early 1970s is not contradicted by evidence from other sources nor checks for internal consistency. The decline estimated by comparing the IFS mid-1970s rates with rates for earlier periods from other sources is slighter than the decline estimated from the IFS data alone, however, because the IFS fertility estimates for earlier periods are higher than those from other sources. This raises the question of whether the IFS estimates exaggerate the decline, as a consequence of misreporting some births as having occurred in the late 1960s – that is, in the period 5–9 years prior to the survey. A tendency to heap births in this period when information is gathered through retrospective maternity histories has been hypothesized by Potter (1977); see also Brass (1978). To examine this issue and to obtain a fuller view of the fertility change, we analyse tables of cohort-period rates.

Cohort-specific fertility rates for five-year periods prior to the survey are presented in table 17. In this table, values in a given column represent period rates, values in a given row represent rates at the same ages, and values in a diagonal (read from upper right to lower left) are those for a single cohort (age group at the time of the survey). There are several ways to present cohort-period rates. We choose a lay-out which facilitates comparison over time of rates at the same ages.

Note that the fertility rates shown in this table are not

Table 17 Cohort-specific fertility rates[a] by five-year period prior to survey

Age at end of period	Years before the survey						
	0–4	5–9	10–14	15–19	20–24	25–29	30–34
15–19	44	61	71	87	83	72	64
20–24	196	210	230	225	223	187	
25–29	245	261	260	253	229		
30–34	202	231	236	230			
35–39	145	182	177				
40–44	84	109					
45–49	34						

[a]Births per 1000 woman-years exposure.
Source: IFS 1976

defined conventionally: for example, women aged 20–24 at the end of the period 0–4 years ago (that is, at the survey date) were aged approximately 17.5–22.5 midway through the period, and spanned an age range from 15.0–25.0 over the five years. Nevertheless, it is valid to compare the rates across the cohorts.

As noted earlier, rates at all ages have declined from the period 5–9 years prior to the survey to the period 0–4 years prior to the survey. The decline in this period is summarized in table 18, which serves to emphasize the recency of the decline.

The rates in table 17 indicate that fertility at ages below 30 rose in the period up to 15–19 years prior to the survey. (This is also evident in figure 11.) This probably reflects the underestimate of births to the older age groups suggested by our previous analysis, but it could also reflect displacement of births towards the survey date, as in Potter's model (1977). Consider the patterns of age-specific fertility rates plotted in figure 13. The profile for women aged 45–49 is displaced markedly towards the older ages. But above age 30 the rates are roughly the same for the three oldest cohorts (excepting the lower rate centred on age 35 for the women aged 35–39, reflecting decline 0–4 years prior to the survey). It seems more plausible to assume that the divergence in the profile for the oldest age group is the consequence of omission of births before age 30, that is, births more than 20 years prior to the survey. A different interpretation might be placed on the rates shown for women aged 40–44. Referring back to figure 9, we note that their cumulative fertility is initially lower than younger cohorts but by age 30 is essentially at the same level. This is suggestive of displacement of births by this cohort towards the survey date, although it is also explained by a rise in fertility at the youngest ages among the younger cohorts.

Table 18 Percentage fertility decline between periods, by age at the end of the period

Age at the end of each period	Periods compared	
	(5–9)/(0–4)	(10–14)/(5–9)
15–19	27.9	14.1
20–24	6.7	8.7
25–29	6.1	0.0
30–34	12.6	2.1
35–39	20.3	+2.8 (increase)
40–44	22.9	
Decline in period fertility cumulated to ages 35–39	11.9%	3.3%

Source: table 17

Cumulative age-specific fertility rates by cohort and period are shown in table 19. The values in the first panel are the cumulative fertility rates for a given age-group, or cohort, as of specific dates. For example, values in the first column are cumulative fertility for women aged 15–19, ..., 45–49, zero years before the survey (ie at the survey date). Values in the second column are for women aged 15–19, ..., 40–44, five years before the survey date. Cumulative fertility values for a given cohort lie along the diagonal: for example, the age group 40–44 averaged 0.38 live births as of 25 years before the survey and 1.50 live births 20 years before the survey. (Figure 9 shows these same rates.)

The values in the second panel are cumulative fertility rates within the specified five-year periods. For example, by approximate age 37.5 the cumulative fertility in the period 0–4 years prior to the survey is 4.16, whereas the corresponding value for 5–9 years before the survey is 4.73.

The third panel of table 19 shows the ratios of the cumulative rates of the first two panels, commonly known as P/F ratios (ratios of cohort (P) and period (F) cumulative rates). Since in the absence of fertility change or reporting errors these ratios equal unity, the P/F ratios are frequently employed as indicators of omission and dating errors or as measures of fertility change. (See, for example, Brass 1978.) Ratios over one indicate either omission of births, displacement of births out of the period in question, or fertility decline. Ratios less than one indicate either displacement of births into the period in question, or a rise in fertility.

The P/F ratios less than one for the older age groups in the period ten years and more before the survey indicate, once again, omission of births (or selective representation of lower parity women in these cohorts). The ratios in excess of one at all ages above 20 in the most recent period are consistent with a decline in fertility. They are also consistent with displacement of births out of this period into prior periods, but consequent P/F ratios less than one for the periods 5–14 years before the survey are not evident, except for the oldest cohort.

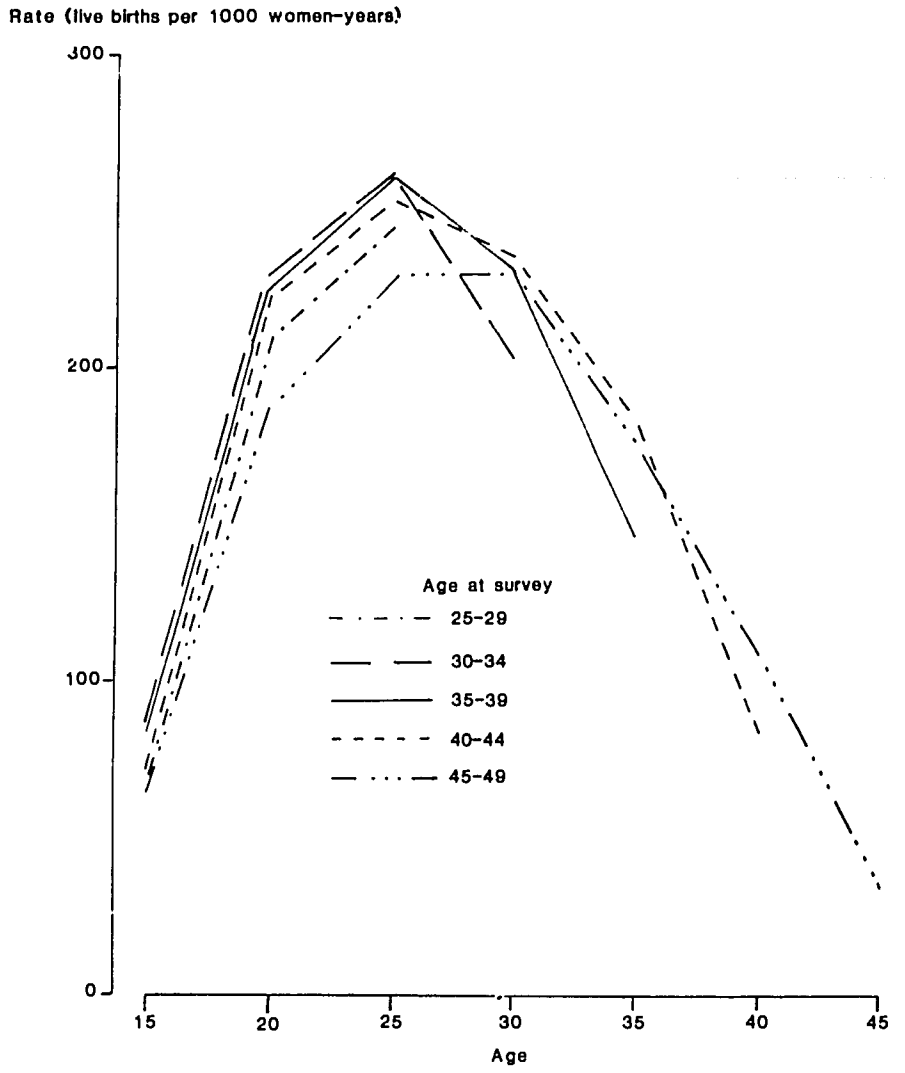

Figure 13 Cohort-period fertility rates, by cohort, aligned according to central age of rate

Source: table 17

A more severe test of the internal consistency of the maternity history data is provided by analysis of fertility rates for first births alone. It is reasonable to assume that the proportion of women eventually having at least a first birth is relatively more stable across cohorts than the proportion having higher-order births, and hence changes over periods or cohorts in first-birth rates is indicative of misreporting of dates of first births or changes in their timing. There is evidence that the youngest cohorts have postponed the first birth (Casterline and Trussell 1980), which follows from the delay of first marriage observed for the same women (see chapter 4).

Cohort-period first birth fertility rates are presented in table 20, and the two sets of cumulative rates and the P/F ratios in table 21. The low cumulative period rates for the most recent period (second panel of table 21) and the resulting P/F ratios in excess of one (third panel) seem best explained by delay of first birth among younger cohorts.

The totals for the cumulations within period (second panel) show disturbing irregularity across periods: the figure of 0.85 for the most recent period may reflect a genuine dearth of first births resulting from postponements, but the peak value of 0.98 for 15–19 years prior to the survey (and the low P/F ratios for this and adjacent periods) seems extreme. One explanation for this pattern is a displacement of the first births of the oldest cohort, and women aged 40–44 as well, forward from previous periods. Equally, omission of first births – so that higher-order (and thus more recent) births appear in the histories as first births – would produce the same effect. It is also possible, as we noted in the discussion of differentials among the older women in age at first marriage, that first births were postponed in the period more than 25 years prior to the survey, as a consequence of the Japanese occupation and the Independence war.

In the light of the evidence suggesting omission by older women presented above, we consider omission of first births a more persuasive explanation than incorrect dating. The IFS data show a decline in the median age at first birth over the four cohorts from women aged 45–49 to women aged 30–34 of 1.4 years (20.2–18.8) and then a rise of 1.0 year through women aged 20–24 (Casterline and Trussell 1980; see also IFS Principal Report, Central Bureau of Statistics, p. 68, table 6.20). Consistent with the decline in median age, the length of the interval from marriage to first birth drops sharply from the oldest cohorts to women

Table 19 Cumulative fertility for cohorts (P) and periods (F) and P/F ratios by age, for five-year periods prior to the survey

Age at end of period	Years before the survey						
	0–4	5–9	10–14	15–19	20–24	25–29	30–34
A Cumulative fertility of cohorts at ends of periods (P)							
15–19	0.22	0.32	0.38	0.46	0.44	0.38	0.34
20–24	1.30	1.43	1.62	1.57	1.50	1.28	
25–29	2.66	2.92	2.87	2.76	2.42		
30–34	3.93	4.02	3.94	3.58			
35–39	4.75	4.85	4.46				
40–44	5.27	5.00					
45–49	5.18						
B Cumulative fertility within periods (F)							
15–19	0.22	0.31	0.38	0.46	0.44	0.39	0.34
20–24	1.20	1.36	1.52	1.58	1.56	1.32	
25–29	2.43	2.66	2.82	2.85	2.70		
30–34	3.44	3.82	4.00	4.00			
35–39	4.16	4.73	4.89				
40–44	4.58	5.28					
45–49	4.76						
C P/F ratios							
15–19	1.00	1.05	1.01	1.01	1.00	0.97	1.02
20–24	1.08	1.06	1.06	0.99	1.31	0.97	
25–29	1.09	1.01	1.02	0.97	0.90		
30–34	1.14	1.05	0.98	0.89			
35–39	1.14	1.02	0.91				
40–44	1.15	0.95					
45–49	1.09						

Source: table 17

Table 20 Cohort-specific first birth rates[a] by five-year period prior to survey

Age at end of period	Years before the survey						
	0–4	5–9	10–14	15–19	20–24	25–29	30–34
15–19	35	43	51	59	56	51	44
20–24	87	83	82	85	90	76	
25–29	36	28	31	31	34		
30–34	8	6	10	15			
35–39	2	2	5				
40–44	1	1					
45–49	–						

[a]Births per 1000 woman-years exposure.
Source: IFS 1976

under age 35 at the survey.[4] This occurs despite a tendency on the part of older women to displace the date of first marriage towards the survey date, as argued in chapter 4. A final piece of evidence of the low quality of the information on the fertility experiences of older women early in marriage comes from the Indonesia Reliability Study: the percentage of women reporting discrepant ages at first birth was 63.3 overall, increasing from less than 60 per cent among women aged 20–24 to roughly 70 per cent among women over age 40 (MacDonald *et al* 1978).

Cohort-period rates, and their cumulations within period

[4] The median interval is 3.3 years for women married 25–29 years before the survey and 1.9 years for women married 5–9 years before the survey. See IFS Principal Report, Central Bureau of Statistics, 1978, p. 54. The comparison across cohorts is complicated by the higher incidence of premarital first births among the oldest women, as shown in table 12 in this report.

Table 21 Cumulative fertility for cohorts (P) and periods (F) and P/F ratios by age, for five-year periods prior to the survey: first births only

Age at end of period	Years before the survey						
	0–4	5–9	10–14	15–19	20–24	25–29	30–34
A Cumulative fertility of cohorts at ends of periods (P)							
15–19	0.18	0.23	0.28	0.32	0.31	0.27	0.24
20–24	0.66	0.70	0.74	0.74	0.72	0.62	
25–29	0.88	0.88	0.89	0.88	0.80		
30–34	0.92	0.92	0.92	0.87			
35–39	0.93	0.94	0.90				
40–44	0.94	0.90					
45–49	0.90						
B Cumulative fertility within periods (F)							
15–19	0.18	0.22	0.27	0.32	0.31	0.28	0.24
20–24	0.62	0.64	0.68	0.74	0.76	0.66	
25–29	0.80	0.78	0.84	0.90	0.93		
30–34	0.84	0.80	0.88	0.98			
35–39	0.84	0.82	0.91				
40–44	0.85	0.82					
45–49	0.85						
C P/F ratios							
15–19	1.00	1.04	1.04	1.02	1.00	0.95	1.04
20–24	1.08	1.09	1.08	0.99	0.95	0.94	
25–29	1.11	1.13	1.07	0.97	0.86		
30–34	1.10	1.14	1.04	0.89			
35–39	1.10	1.15	0.98				
40–44	1.11	1.10					
45–49	1.06						

Source: IFS 1976

and cohort, as well as the corresponding P/F ratios, are presented for subgroups of the IFS sample in the tables in appendix B. We do not discuss these tables in this report, but provide them for further analysis by others.

To sum up, the analysis of cohort-period fertility rates lends credibility to the overall picture of fertility trends shown in figure 10. We do not rule out the possibility that the decline shown in the early 1970s is the consequence of misreporting dates of births. Some evidence emerges to support this hypothesis. Moreover, omission of births occurring during this period (resulting from underenumeration of young children, for example) is difficult to detect. Several features of the detailed rates reaffirm our previous conclusion that older respondents omitted births occurring 20 or more years prior to the survey. The omitted births are probably disproportionately lower-order births. The dating of births in the 15 years prior to the survey by five-year period appears sound.

5.4 FURTHER TESTS FOR OMISSION OF BIRTHS

Certain types of live births are more likely to be omitted from maternity history reports. In particular, because of poor memory or misunderstanding of the questions, women may fail to report children who died, particularly those who died many years prior to the survey.

In addition, in societies where a preference for male children is common, female births may be more frequently omitted from the maternity history than male births. An examination of sex ratios of births and infant and child mortality rates can reveal some of these selective omissions.

Sex ratios of births reported in the IFS are presented in table 22. The sex ratio for all births and sex ratios of births to women classified by selected variables are shown. The overall ratio of 103.9 is not incompatible with the expected sex ratio at birth of roughly 105. The most marked divergence from expectations is the ratio of 97 for the period 15–19 years prior to the survey. The ratio for women aged 35–44 is also a bit low (100.2). The low ratio for births in the one period indicates either omission of sons born in that period or, more plausibly, displacement of male births out of that period into the adjacent periods and/or displacement of female births into the period. Displacement out of this period was not especially evident in the above analysis of P/F ratios.

We examine the data on infant and child mortality in detail in chapter 6. In table 23, we show simply the proportion of children ever born who have not survived to the

Table 22 Sex ratios[a] of births, by selected characteristics of respondents

Total:	103.9		
Age at the survey		*Type of place of residence*	
<25 yrs	108.9	Urban	103.4
25–34	106.4	Rural	104.1
35–44	100.2		
45–49	106.0	*Parity at survey*	
		1	106.4
Years before the survey		3+	103.4
0–4	103.5		
5–9	104.7	*Level of educational attainment*	
10–14	107.0	Less than primary	103.2
15–19	97.0	Completed primary	105.6
20–24	107.4	Secondary or higher	106.1
25+	102.9		

[a]Males per 100 females.
Source: IFS 1976

Table 23 Proportion of children ever born not surviving, by sex and by current age of mother

Current age of mother	Proportion of dead children		
	Total	Male	Female
15–19	0.14	0.18	0.10
20–24	0.15	0.17	0.13
25–29	0.15	0.18	0.12
30–34	0.20	0.21	0.18
35–39	0.20	0.21	0.18
40–44	0.22	0.24	0.20
45–49	0.27	0.28	0.26

Source: IFS 1976

survey date, by current age of the respondent. As we have previously concluded that older women have omitted some births, we might expect this omission to be selective of children who have not survived. The proportions in table 23, however, increase with age (for both male and female births), providing no obvious indication of such selective omission by older women in particular.

In summary, our assessment of the fertility data supports the validity of the overall trend of relatively stable fertility in the period 1955–70 and declining fertility subsequent to 1970. There is considerable evidence that the fertility of the oldest cohorts is under-estimated, as a consequence either of omission of births or of age misreporting in the household survey selective of higher parity women. To the extent births were omitted, they appear to be confined largely to lower-order births and births which occurred two decades or more prior to the survey. The analysis suggests that the level and timing of recent fertility is relatively accurately reported, excepting the three-year period immediately prior to the survey, where births occurring in 1974 seem to have been shifted to the adjacent years. The coverage of births in the IFS appears to be more complete than in other recent censuses and surveys in Indonesia.

6 Infant and Child Mortality

Information on the date of death or age at death of each child who died was obtained in the maternity history section of the individual survey. This information, in conjunction with the information on the dates of births, can be used to calculate standard measures of infant and child mortality: the probability of dying between birth and exact age one ($_1q_0$); the probability of dying between exact age one and exact age five ($_4q_1$); and the probability of dying between birth and exact age five ($_5q_0$). Calculation of these measures by period prior to the survey provides estimates of levels and trends in infant and child mortality, which can then be examined for evidence of omission of children who died or displacement of the date of death (misreporting age at death).

Probabilities of dying at specified ages are shown in table 24 for single years in the period 1945 through 1975. The same probabilities are smoothed, using three-year moving averages, and plotted in figure 14. As the probabilities for the period before 1950 are based on small numbers of births which must have occurred to young women (and are also selectively first-order or lower-order births), the sharp decline in this period should be regarded cautiously. But the late 1940s was a period of hardship in Indonesian society, as a consequence of the post-War turmoil and the Independence struggle, and hence mortality may have been unusually high. In the period since 1950, the IFS data show a moderate decline in infant and child mortality from roughly 1953–60, little change from 1960 through 1965, another moderate decline in the late 1960s, and apparently little change since 1970. We note that the overall decline in the 1960s is of the same order as the 25–30 per cent decline between the 1961 and 1971 Censuses estimated by McNicoll and Mamas (1973).

There is some suggestion in table 24 and figure 14 of compensating movements in $_1q_0$ and $_4q_1$: note, for example, the period 1950–2. This can be explained by a tendency to overstate the deaths of infants or understate the deaths of children. Such misstatement of the age at death is suggested even more clearly in figure 15, where numbers of deaths by age at death are plotted. Peaks in the numbers dying before age one are accompanied by troughs in the numbers dying between age one and five (eg 1950, 1956, 1962, 1967).

Another perspective on the accuracy of the IFS estimates of infant and child mortality is obtained by comparison with estimates from other sources. As vital registration figures are not available, we must rely on census or survey data. In table 25, we compare the IFS estimates for the birth cohort 1963–7 with those provided by the 1973 F-M Survey. The estimates are shown by region. The IFS estimates are consistently higher. This suggests more complete reporting of infant and child deaths in the IFS. Indeed, previous investigators suspected substantial understatement of infant mortality in the F-M Survey, due to omission of infants who died and overstatement of age at death (McDonald *et al* 1976).

For successive periods in the past, the average age of mother at the time of birth of children becomes progressively younger in the IFS data, since no women older than 49 are included in the survey. For example, in the period 20–24 years prior to the survey, no mother could have

Table 24 Probabilities of infant and child death, by calendar years

Year	Births	Deaths, by age of child at death			Probabilities of death[a]		
		Less than 1 year	1–4 years	0–4 years	$_1q_0$	$_4q_1$	$_5q_0$
1945	110	31	17	48	.282	.215	.436
1946	141	40	19	59	.284	.188	.418
1947	201	50	20	70	.249	.132	.348
1948	246	54	33	87	.220	.172	.354
1949	208	57	28	95	.198	.121	.330
1950	410	76	28	104	.185	.084	.254
1951	462	67	50	117	.145	.127	.253
1952	505	88	66	154	.174	.158	.305
1953	597	102	57	159	.171	.115	.266
1954	639	104	76	180	163	.142	.282
1955	800	94	85	179	.118	.120	.224
1956	830	127	70	197	.153	.100	.237
1957	912	108	91	199	.118	.113	.218
1958	952	114	182	196	.120	.098	.206
1959	1050	118	85	203	.112	.091	.193
1960	1125	132	101	233	.117	.086	.207
1961	1207	130	98	228	.108	.091	.188
1962	1140	171	90	261	.150	.093	.229
1963	1290	153	104	257	.119	.092	.199
1964	1272	143	125	268	.112	.111	.211
1965	1429	164	112	276	.115	.088	.193
1966	1371	154	110	264	.112	.090	.192
1967	1519	157	80	237	.103	.059	.156
1968	1472	142	87	229	.096	.065	.155
1969	1541	164	94	258	.106	.068	.162
1970	1608	130	99	229	.081	.067	.148
1971	1674	140	96	236	.084	.063	.141
1972	1617	148	100	248	.092	.068	.153
1973	1526	160	57	217	.105	.042	.142
1974	1308	126	29	155	.096	.024	.118
1975	1572	135	4	139	.086		

[a] $_1q_0$ probability of death between birth and exact age 1. $_4q_1$ probability of death between exact age 1 and exact age 5. $_5q_0$ probability of death between birth and exact age 5.
Source: IFS 1976

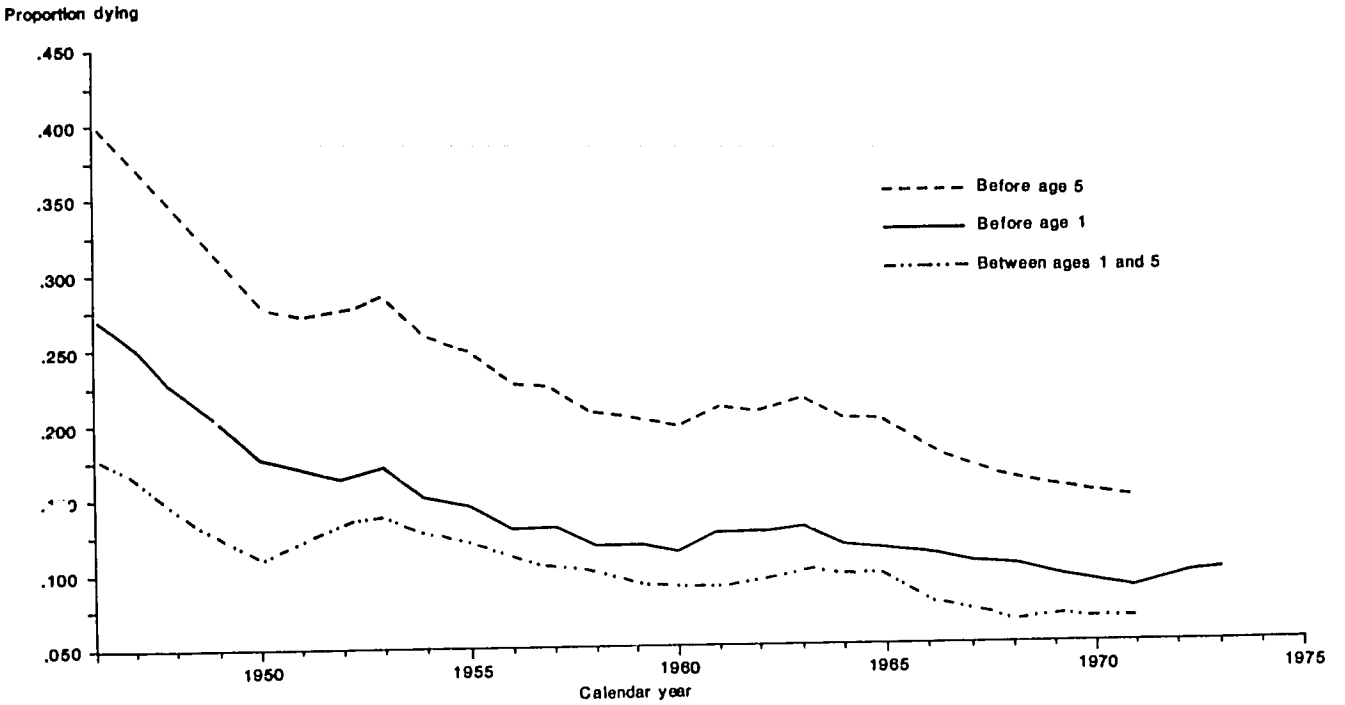

Figure 14 Proportion of children dying before age 1, between ages 1 and 5, and before age 5, by calendar year

Figure 15 Number of children dying before age 1 and between ages 1 and 5, by calendar year

been older than 30. Hence, strictly speaking, trends in infant mortality should be assessed within categories of age of mother at the birth.

The probability of dying in the first year of life is shown in table 26 by age of the respondent at the birth for five-year periods in the past. We note the expected U-shaped pattern by age, with the highest probabilities of death at ages below 20 and above 40. The overall trends evident in table 24 and figure 14 are, for the most part, present here within age groups. As previously, the largest changes observed are between 20–24 and 15–19 years prior to the survey and between 10–15 and 5–9 years prior to the survey.

As a final means of evaluating the mortality data, we identify the mortality levels in model life tables which

Table 25 Comparison of $_1q_0$ and $_5q_0$ for birth cohort 1963–7, from the 1973 Fertility-Mortality Survey and IFS 1976

Region	F-M Survey 1973[a]		IFS 1976[b]	
	$_1q_0$	$_5q_0$	$_1q_0$	$_5q_0$
Jakarta	NA	NA	.079	.156
West Java			.116	.233
Urban	.085	.136	–	–
Rural	.094	.188	–	–
Central Java			.113	.182
Urban	.068	.087	–	–
Rural	.117	.157	–	–
Yogyakarta	NA	NA	.085	.138
East Java			.116	.172
Urban	.065	.081	–	–
Rural	.108	.117	–	–
Bali			.141	.179
Urban	NA	NA	–	
Rural	.081	.177	–	

[a]*Source:* Peter McDonald, M. Jasin and Gavin Jones (1976). *Level and Trends in Fertility and Childhood Mortality in Indonesia.* Demographic Institute, University of Indonesia (F-M Survey 1973, Monograph no 1, table 5.1, p 57).
[b]Due to small sample sizes, estimates for $_1q_0$ and $_5q_0$ for urban and rural areas separately are not provided.

correspond to the probabilities of dying, estimated separately by sex. We select the West family of model life tables from the Coale-Demeny set (Coale and Demeny 1966). If the reporting of deaths by sex and age of death are complete (or not differentially incomplete), we expect the mortality levels by sex and age interval up to age five to be essentially identical. Unless mortality has been stable over time, however, the levels for periods should differ, corresponding to the trend in mortality. (Of course, some divergence from our expectations may arise because of the inapplicability of the West family of life tables to Indonesia.)

The levels shown in table 27 raise some doubts about the IFS mortality data. The levels for females are generally higher, which indicates better survivorship. This differential is larger in earlier periods. As the model tables take account of an expected sex differential, the differential evident here could well be due to the omission of females who died, particularly those dying prior to five years before the survey. But the sex difference in levels is rather small, and the sex ratios of births in table 22 gives no indication of substantial omission of female births. (Possibly the sex differential implicit in the model tables is not appropriate for Indonesia.) We also note that the life-table level of $_1q_0$ is consistently higher than the level of $_4q_1$, for both sexes. (The same holds true for the 1973 F-M Survey mortality estimates (McDonald *et al* 1976).) This suggests either relatively greater omission of infant deaths or overstatement of age at death of infants. (Once again, the explanation may be inapplicability of the model tables.) The trends

Table 27 Estimates of $_1q_0$, $_4q_1$, and $_5q_0$, and the corresponding level of West model life table, by sex and years prior to the survey

Years before the survey	Estimate of $_1q_0$, $_4q_1$, $_5q_0$			Level of West model life table		
	$_1q_0$	$_4q_1$	$_5q_0$	$_1q_0$	$_4q_1$	$_5q_0$
A Males						
5–9	.106	.074	.172	15.5	12.7	14.3
10–14	.129	.105	.221	13.7	10.1	12.2
15–19	.147	.104	.236	12.6	10.2	11.6
20–24	.168	.134	.280	11.2	7.8	9.8
25+	.230	.127	.325	7.5	8.4	8.2
B Females						
5–9	.089	.061	.145	15.4	14.0	14.7
10–14	.110	.085	.186	14.3	12.2	12.0
15–19	.098	.095	.183	14.7	12.9	12.9
20–24	.126	.120	.230	12.5	8.8	9.7
25+	.185	.151	.310	8.6	6.6	7.7

Source: IFS 1976

Table 26 Probability of death in the first year of life ($_1q_0$), by years before the survey and age of mother at the time of the child's birth

Age of women at birth	Total	Years before the survey						
		0–4	5–9	10–14	15–19	20–24	25–29	30–34
10–14	.207	(.161)[a]	.210	.141	.205	.224	.259	.216
15–19	.145	.111	.121	.146	.128	.172	.209	.255
20–24	.106	.084	.087	.118	.113	.121	.171	
25–29	.100	.077	.095	.101	.120	.134		
30–34	.095	.088	.081	.116	.107			
35–39	.100	.085	.099	.134				
40–44	.107	.103	.116					
45–49	(.222)	(.222)						

[a]Parentheses denote small sample size.
Source: IFS 1976

in mortality levels over periods are roughly in conformity with the other evidence reviewed in this section.

In summary, the data on infant and child mortality appear to suffer from omission of some deaths occurring 15 years or more prior to the survey (in particular deaths of female children) and a tendency to overstate the age at death of infants. As a consequence of the omissions, the estimated decline in infant and child mortality may be somewhat understated. The reporting of infant and child deaths seems, on the whole, more complete in the IFS than in the Fertility and Mortality Survey of 1973, the most proximate comparable source of data.

7 Summary

Our evaluation of the Indonesia Fertility Survey of 1976 indicates that the data are generally of good quality, with some defects apparent.

The reporting of age shows bias arising from a tendency to choose ages ending in preferred digits. This characterizes the IFS household survey data more than the individual survey data. There is also evidence that some women under age 50 are reported over age 50 in the household survey, an error which potentially impairs the validity of the individual survey estimates for older women.

Marital status appears to be very accurately reported, but the retrospective reports of date at first marriage for older women suggest displacement of the date towards the survey. Evidence from the IFS and other sources indicates that the age at first marriage rose in the early 1970s, a continuation of a trend from the previous decade, but the IFS retrospective data (from the marriage history) show a more rapid rise than other sources suggest.

Our evaluation of the fertility data suggests that fertility began to decline about 1971. The estimates for the three calendar years 1973–5 show an unexplained trough in 1974 which is probably not genuine. There is evidence of omission of births which occurred more than 20 years prior to the survey; these are of course almost entirely births to women over age 40 at the survey interview. The reporting of births which occurred in the 15 years prior to the survey appears to be largely complete and accurate.

The reporting of infant child deaths in the IFS seems more complete than in other recent censuses and surveys in Indonesia. There is evidence of the omission of a small proportion of infant deaths, or possibly a tendency to overstate the age at death of infants, as well as evidence of greater omission of deaths of female infants and children. The IFS data conform with other sources in showing a decline in infant and child mortality since Independence which has continued into the mid-1970s.

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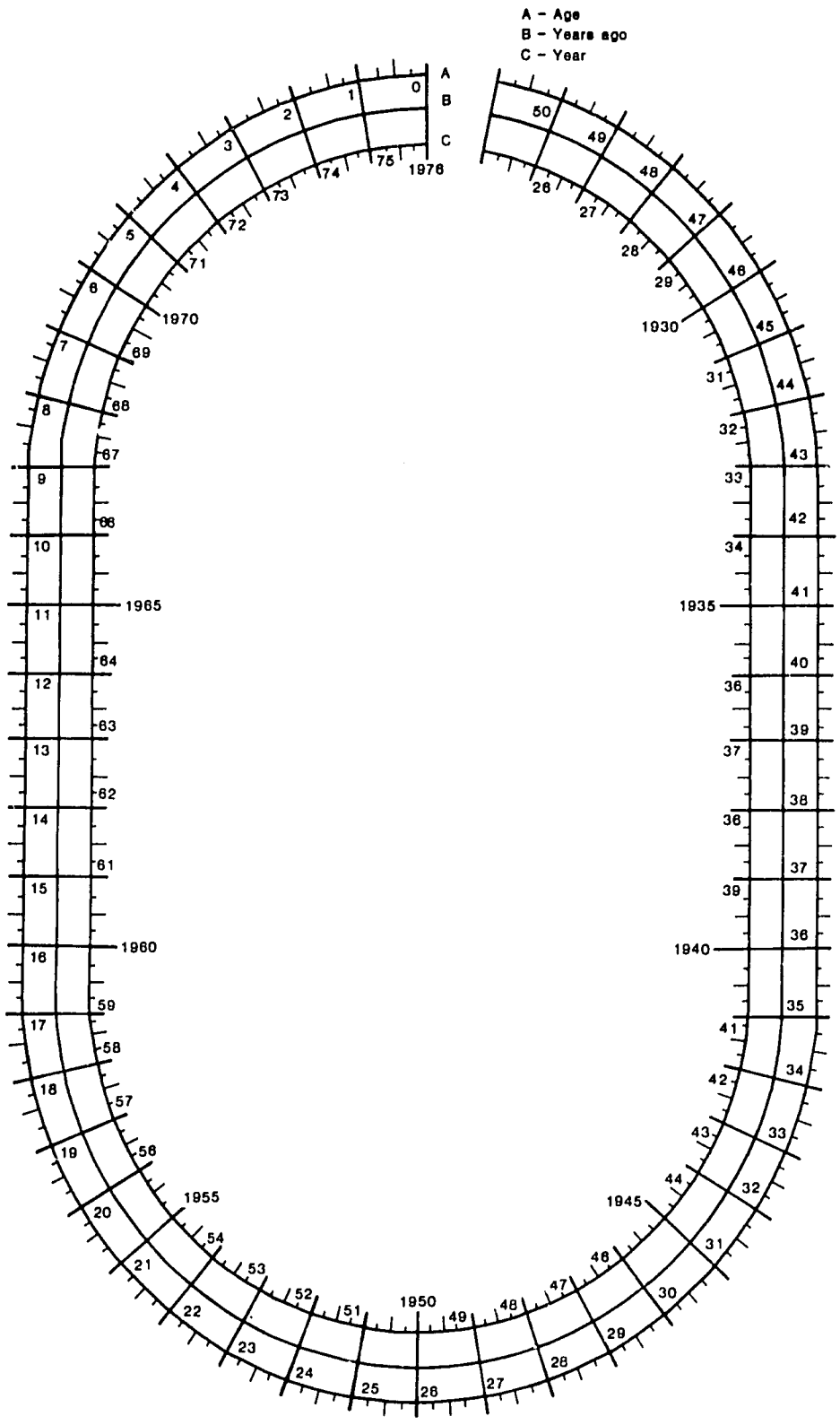
Appendix A – Events Chart



Appendix B – Detailed Subgroup Tables

Table B1 Percentage ever married by age at survey, according to type of place of current residence, region of residence and language

Age group at survey	Type of place		Region of residence						Language				Total
	Urban	Rural	Jakarta	W. Java	C. Java	Yog.	E. Java	Bali	Bahasa Indo.	Javanese	Sundanese	Other	
15–19	20.1	42.1	21.1	50.2	32.0	13.3	38.9	15.7	29.5	33.0	52.2	43.8	37.4
20–24	58.5	85.4	63.6	72.4	78.2	62.7	79.5	64.3	66.8	80.1	93.0	74.1	79.8
25–29	87.7	96.4	87.4	98.4	95.1	88.0	94.5	89.1	89.7	95.0	98.5	93.6	94.9
30–34	94.9	98.6	93.5	98.4	98.9	97.8	98.0	94.9	95.0	98.8	98.5	96.8	98.0
35–39	97.8	98.7	97.9	99.3	98.7	100.0	98.0	94.7	98.2	98.8	99.0	95.7	98.5
40–44	98.7	99.3	100.0	100.0	98.7	97.9	99.3	95.2	98.7	99.2	100.0	97.8	99.2
45–49	99.1	99.3	100.0	99.1	100.0	94.7	99.5	92.9	98.2	99.7	100.0	97.5	99.3

Table B2 Cohort-period fertility rates, current parity, cumulative fertility and P/F ratios for 0–4 years before the survey, by type of place of current residence

Age of cohort at survey	Number of women in cohort	Years before the survey							0–4 years before the survey		
		0–4	5–9	10–14	15–19	20–24	25–29	30–34	P	F	P/F
A Urban											
15–19	595	29	0						0.15	0.15	1.00
20–24	426	158	38	2					0.99	0.94	1.06
25–29	272	256	195	50	4				2.53	2.22	1.14
30–34	248	215	259	201	70	3			3.74	3.29	1.14
35–39	248	144	235	280	213	73	4		4.74	4.01	1.18
40–44	200	71	178	276	279	228	65	3	5.51	4.36	1.26
45–49	156	31	83	170	245	240	179	58	5.05	4.52	1.12
B Rural											
15–19	2077	46	2						0.24	0.24	1.00
20–24	1609	209	69	5					1.41	1.28	1.10
25–29	1309	242	216	79	5				2.71	2.49	1.09
30–34	1196	199	261	237	93	7			3.99	3.49	1.14
35–39	1181	143	230	256	229	87	8		4.77	4.20	1.13
40–44	1060	84	181	230	249	222	75	5	5.23	4.62	1.13
45–49	815	33	114	177	227	225	192	67	5.21	4.79	1.09

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Table B3 Cohort-period fertility rates, current parity, cumulative fertility and P/F ratios for 0–4 years before the survey, by region of residence

Age of cohort at survey	Number of women in cohort[a]	Years before the survey							0–4 years before the survey		
		0–4	5–9	10–14	15–19	20–24	25–29	30–34	P	F	P/F
A Jakarta											
15–19	569	33	1						0.17	0.17	1.00
20–24	444	185	45	5					1.17	1.10	1.07
25–29	309	235	170	40	4				2.25	2.27	0.99
30–34	254	225	268	205	71	3			3.86	3.40	1.14
35–39	237	153	264	286	239	73	3		5.09	4.17	1.22
40–44	177	91	211	310	288	202	70	3	5.88	4.62	1.27
45–49	116	46	125	232	279	263	195	70	6.09	4.85	1.25
B West Java											
15–19	543	60	3						0.31	0.31	1.00
20–24	524	179	69	3					1.26	1.21	1.04
25–29	327	274	226	82	5				2.94	2.58	1.14
30–34	296	223	265	239	108	10			4.22	3.69	1.14
35–39	281	180	269	271	269	85	10		5.42	4.60	1.18
40–44	198	123	210	256	271	275	105	10	6.24	5.21	1.20
45–49	15[illegible]	37	140	167	223	202	212	73	5.28	5.39	0.98
C Central Java											
15–19	585	37	0						0.19	0.19	1.00
20–24	423	205	49	4					1.29	1.21	1.06
25–29	325	258	215	71	4				2.74	2.50	1.09
30–34	315	212	286	262	106	7			4.36	3.56	1.22
35–39	266	146	238	285	229	104	5		5.03	4.30	1.17
40–44	337	82	194	249	258	211	68	4	5.33	4.70	1.13
45–49	221	32	107	218	281	246	174	59	5.60	4.87	1.15
D Yogyakarta											
15–19	289	16	0						0.08	0.08	1.00
20–24	215	120	25	0					0.73	0.68	1.07
25–29	159	216	163	22	0				2.01	1.76	1.14
30–34	148	189	225	176	45	1			3.18	2.70	1.18
35–39	148	155	236	250	195	50	0		4.43	3.48	1.27
40–44	155	64	165	231	238	177	17	0	4.46	3.80	1.18
45–49	131	27	113	207	257	243	147	37	5.15	3.93	1.31
E East Java											
15–19	556	37	2						0.19	0.19	1.00
20–24	432	183	63	5					1.26	1.11	1.13
25–29	361	205	210	82	7				2.52	2.14	1.18
30–34	316	167	232	208	69	6			3.41	2.97	1.15
35–39	371	110	188	230	196	80	9		4.06	3.52	1.15
40–44	292	55	144	202	233	213	68	3	4.58	3.80	1.21
45–49	261	28	90	138	184	223	194	70	4.70	3.94	1.19
F Bali											
15–19	323	26	0						0.13	0.13	1.00
20–24	265	176	46	4					1.13	1.01	1.12
25–29	212	259	180	36	0				2.37	2.31	1.03
30–34	183	226	299	222	54	2			4.01	3.44	1.17
35–39	174	166	283	284	186	34	0		4.77	4.27	1.12
40–44	92	78	183	268	263	144	28	0	4.82	4.66	1.04
45–49	63	59	106	211	277	215	148	36	5.26	4.95	1.06

[a]Since the survey oversampled DKI Jakarta, Yogyakarta and Bali, the numbers of women presented in this table are the weighted numbers divided by the overall weighting factor for the region, in order to give more reasonable bases for judging the variability in the rates.

Table B4 Cohort-period fertility rates, current parity, cumulative fertility and P/F ratios for 0–4 years before the survey, by language

Age of cohort at survey	Number of women in cohort	Years before the survey							0–4 years before the survey		
		0–4	5–9	10–14	15–19	20–24	25–29	30–34	P	F	P/F
A Bahasa Indonesia											
15–19	232	55	4						0.30	0.30	1.00
20–24	149	195	61	3					1.29	1.27	1.02
25–29	83	253	189	51	9				2.51	2.54	0.99
30–34	91	223	287	230	98	1			4.19	3.65	1.14
35–39	74	174	273	311	240	94	7		5.50	4.52	1.14
40–44	60	113	210	256	224	234	87	9	5.67	5.09	1.00
45–49	46	35	152	231	310	216	186	46	5.90	5.27	0.97
B Javanese											
15–19	1583	36	1						0.18	0.18	1.00
20–24	1207	195	56	4					1.28	1.16	1.10
25–29	934	236	217	68	5				2.63	2.34	1.13
30–34	888	193	260	235	83	6			3.88	3.30	1.18
35–39	878	140	231	266	217	82	7		4.71	4.00	1.18
40–44	830	71	180	239	252	209	63	3	5.08	4.36	1.17
45–49	619	35	109	193	243	238	172	58	5.26	4.53	1.16
C Sundanese											
15–19	566	60	2						0.31	0.31	1.00
20–24	425	232	89	5					1.63	1.47	1.11
25–29	367	269	233	95	6				3.01	2.82	1.07
30–34	317	227	273	244	116	12			4.36	3.95	1.10
35–39	306	164	245	259	269	93	7		5.19	4.77	1.09
40–44	240	122	205	252	273	266	109	10	6.19	5.39	1.15
45–49	161	29	123	170	227	221	225	93	5.45	5.53	0.99
D Other languages											
15–19	246	38	2						0.20	0.20	1.00
20–24	218	180	59	6					1.23	1.10	1.11
25–29	189	247	166	72	2				2.43	2.34	1.04
30–34	144	192	232	186	69	5			3.42	3.30	1.04
34–39	173	112	181	205	190	80	11		3.90	3.86	1.01
40–44	129	59	129	193	239	221	72	5	4.59	4.15	1.10
45–49	144	26	79	94	150	196	229	74	4.32	4.29	1.01