The Second Malaysian Family Life Survey

Quality of Retrospective Data for the New Sample

Jeffrey Sine, Christine E. Peterson
The research described in this report was supported by the National Institute of Child Health and Human Development, Grant R01 HD23329.
The Second Malaysian Family Life Survey

Quality of Retrospective Data for the New Sample

Jeffrey Sine, Christine E. Peterson

Supported by the National Institute of Child Health and Human Development
This report assesses the quality of data collected on New Sample respondents for the Female Life History (MF22) of the Second Malaysian Family Life Survey (MFLS-2). The MFLS-2 was a retrospective household survey carried out in Peninsular Malaysia in 1988-1989 as a collaborative project of RAND and the National Population and Family Development Board of Malaysia with support from the (United States) National Institute of Child Health and Human Development and the National Institute on Aging. The New Sample consists of women aged 18 to 49, regardless of marital status, and women under age 18 who have ever been married. Data from the New Sample Female Life History examined in this report include: nuptiality, fertility, infant and fetal mortality, birthweight, contraception, breastfeeding, and women's education. These data were compared with data from official Malaysian government documents, such as census reports and Vital Statistics, and with data from other surveys fielded in Malaysia. Trends as computed from the data were also assessed for consistency with known demographic trends in the country. The document also contains information on the current (1989) status of vital events in Peninsular Malaysia.

The MFLS-2 also reinterviewed women who were respondents to the original First Malaysian Family Life Survey (MFLS-1), which was fielded in 1976. Reinterviewed women were asked full retrospective histories including years previously covered in MFLS-1. This report does not examine the quality of recall data for this group of women. Current RAND research is under way to examine differences in recall between MFLS-1 and MFLS-2 for these women.

This report should be of interest to researchers and policymakers who intend to use the MFLS-2 for analyses and need assurance that its data are reflective of the Peninsular Malaysian population. It should also be useful to those who are interested in a general overview of recent demographic changes in Malaysia.
Other RAND publications essential for users of the MFLS-2 data include:


- MR-107-NICHD/NIA, *The Second Malaysian Family Life Survey: Survey Instruments*, 1993, by Julie DaVanzo, John G. Haaga, Tey Nai Peng, Ellen H. Starbird, and Christine E. Peterson with the Staff of the Population Studies Center of the National Population and Family Development Board of Malaysia. The document presents the actual questionnaires used in MFLS-2 and the Interviewers’ Instruction Manual. The development of the instruments is discussed, as are the findings of debriefings with the field staff during and after the fieldwork.

- MR-108-NICHD/NIA, *The Second Malaysian Family Life Survey: Codebook*, 1993, by Christine E. Peterson, Jeffrey Sine, and Deborah Wesley. This document provides descriptions of all the various subfiles and variables that make up the MFLS-2 database.

- MR-109-NICHD/NIA, *The Second Malaysian Family Life Survey: User’s Guide*, 1993, by Christine E. Peterson. This document provides descriptions of the MFLS-2 data format and the MFLS-2 data files and presents guidelines regarding how to use the data, with special focus on identifying individuals of interest and linking the various types of data.

Persons interested in learning more about the 1976-1977 Malaysian Family Life Survey or using data from that survey should consult the following RAND publications:

- v -


The MFLS-1 data have been reorganized into files that more closely resemble the format of the MFLS-2 data, to make it easier for users to combine the MFLS-1 and MFLS-2 data in analyses. These reformatted MFLS-1 files are described in:

CONTENTS

Preface ........................................................................................................ iii
Figures ................................................................................................. ix
Tables ..................................................................................................... xi
Summary .............................................................................................. xiii
Acknowledgments ................................................................................ xvii
1. INTRODUCTION ................................................................. 1
2. THE SECOND MALAYSIAN FAMILY LIFE SURVEY (MFLS-2) .......... 3
   Purpose and Design ........................................................................ 3
   Sampling ....................................................................................... 4
3. MARITAL STATUS ....................................................................... 6
   Importance and Potential Problems ............................................... 6
   Marital Status Distribution ......................................................... 7
   Age at First Marriage .................................................................. 11
   Ethnic Differences in Age at First Marriage .............................. 12
4. FERTILITY ................................................................................. 14
   Importance and Potential Problems ............................................ 14
   Birth Date Reporting ................................................................... 16
      Birth Certificates ....................................................................... 16
      Missing Month and/or Year of Birth ........................................... 17
      Birth Reporting (Sex Ratio of Births) ....................................... 17
      Number of Children Born per Woman .................................... 19
      Age-Specific Fertility Rates .................................................... 21
5. INFANT AND PELVIC MORTALITY ................................. 26
   Importance and Potential Problems ........................................... 26
   Infant Mortality Rates ............................................................... 28
   Infant Age at Death .................................................................... 32
   Pelvic Mortality ......................................................................... 33
6. BIRTHWEIGHTS ...................................................................... 38
   Importance and Potential Problems ......................................... 38
   Exact Birthweight Reporting .................................................... 39
   Birthweight Distribution .......................................................... 40
7. CONTRACEPTIVE USE ..................................................... 43
   Importance and Potential Problems ......................................... 43
   Prevalence of Contraceptive Use .............................................. 45
   Methods of Contraception Used ................................................. 46
8. BREASTFEEDING ............................................................ 49
   Importance and Potential Problems ......................................... 49
   Prevalence of Breastfeeding .................................................... 50
   Duration of Breastfeeding ....................................................... 51
9. EDUCATION ........................................................................... 54
   Importance and Potential Problems ......................................... 54
Educational Attainment ........................................ 54
10. CONCLUSIONS .............................................. 58
    Marriage ..................................................... 58
    Fertility ...................................................... 59
    Infant and Fetal Mortality ................................. 59
    Birthweight .................................................. 60
    Contraception ............................................... 61
    Breastfeeding ............................................... 61
    Education .................................................... 62
REFERENCES ..................................................... 63
FIGURES

1(a). Marital Status Distribution in 1985 of Malaysian Women, by Age Group in 1985 ...................................................... 8
1(b). Marital Status Distribution of Malaysian Women in 1980, by Age Group in 1980 ...................................................... 8
1(c). Marital Status Distribution of Malaysian Women in 1970, by Age Group in 1970 ...................................................... 9
1(d). Marital Status of Malaysian Women at Time of Survey ...... 10
2. Age at First Marriage, by Birth Cohort .................................. 11
3. Ethnic Differences in Trends in Mean Age at First Marriage ................................................................. 13
4(a). Mean Number of Children Ever Born to Ever Married Women, by Age Group in 1985 ............................ 20
4(b). Mean Number of Children Ever Born to Ever Married Women, by Age Group in 1980 ............................ 20
4(c). Mean Number of Children Ever Born to Ever Married Women, by Age Group in 1970 .................................. 21
5. Age-Specific Fertility Rates for Malaysian Women, 1981-
   (MFLS-2 is three-year moving average) .......................... 30
   (MFLS-2 is five-year moving average) ............................ 31
10. Distribution of Age at Death for Infants Who Died ....... 33
11. Percentage of Women Ever Experiencing Pregnancy Wastage by 1985, by Age Group ........................................ 36
12. Distribution of Birthweights for Live Births in
   Malaysia, 1982-1986, All Ethnic Groups ....................... 41
13. Infant Mortality Rates by Infant’s Birthweight ............ 42
14. Frequency Distribution of Reported Breastfeeding Duration for Women’s Last Two Live Births .................. 52
15. Percentage of Infants Still Breastfeeding at the Time of the MFLS-2 Interview, All Births vs. Malay Births ... 53
## TABLES

1. Percentage of Live Births with a Birth Certificate Shown to the Interviewer .............................................. 16

2. Completeness of MFLS-2 Birth Date Reporting: Percentage of Cases with Missing Information ....................... 17

3. Sex Ratio of Live Births Reported in MFLS-2 and Vital Statistics, by Year of Birth and Ethnicity ....................... 18


5. Percentage of Ever Married Women Who Ever Experienced an Abortion, by Ethnic Group ............................... 36

6. Percentage of Births with an Exact Birthweight Reported by the Mother, by Decade of Birth and Ethnic Group ........ 39

7. Percentage of Women Who Ever Used Contraceptives by 1985, by Age Group: Comparison of MFLS-2 New Sample and MPFS Data ......................................................................................................................... 45

8. Distribution of Contraceptive Methods Used by MFLS-2 and MPFS Women Who Were Using Contraception as of January 1985; and for Those in the MFLS-2 in 1988 .............................................. 47

9. Percentage of Women Who Breastfed Their Youngest Child, as of 1985 .............................................................. 50


11. Comparison of Educational Attainment Distribution Between 1980 Census and MFLS-2 for the Same Cohorts of Women .... 56

12. Educational Attainment of Malaysian Women in 1988, by Age Group and Ethnic Group Based on the MFLS-2 New Sample ... 57
SUMMARY

The Second Malaysian Family Life Survey (MFLS-2) was fielded in late 1988 and early 1989. This survey, which was a follow-on to the 1976-1977 First Malaysian Family Life Survey (MFLS-1), was designed to provide data for the study of household behavior over a period of rapid demographic and socioeconomic change in Peninsular Malaysia. The quality of data from the Female Life History questionnaire (MF22) collected from MFLS-2 New Sample respondents is assessed in this report.

Quality is assessed primarily on the basis of two criteria: whether the MFLS-2 data are consistent with known or expected patterns and trends, and the degree of consistency with trends and patterns reported from other data sources. Data on marital status, fertility, infant and fetal mortality, birthweights, contraception, breastfeeding, and education are examined. In general, the quality of MFLS-2 data were found to be high; that is, the data are generally representative of the Peninsular Malaysian population.

As expected, the mean age at first marriage for MFLS-2 New Sample women showed an increasing trend over time. However, the proportion of these women reporting themselves to have ever been married was consistently higher than the proportion from other data sources. The MFLS-2 sample may have underrepresented single women, particularly young single women, by sampling only private households. Institutional living quarters, which house an increasing proportion of young persons at institutions of higher education and those employed in industrial firms, were not sampled.

Birth date reporting for births to MFLS-2 women was good and no evidence of a major underreporting or overreporting of live births was found; thus we were able to calculate fertility rates from the data with a high degree of confidence. Fertility patterns were as expected: fertility increased with maternal age-group, peaking among women aged 25 to 29 and declining steadily thereafter. This is the
same pattern observed in Malaysian Vital Statistics (VS) data. However, the MFLS-2 fertility curves appear to be too high for most age groups. This may relate again to the underrepresentation of single women (resulting from exclusion of institutional living quarters, which house primarily single persons) in the MFLS-2 New Sample. The close resemblance between MFLS-2 marital fertility rates and those reported in VS data provides support for this explanation.

There has been a substantial decline in infant mortality rates (IMR) in Peninsular Malaysia since the late 1960s. The IMR curve for Malays, derived from MFLS-2 data, more closely resembled the curve derived from VS data. The curves for Chinese and Indians did not fit as well, probably because of the very small number of infant deaths in the MFLS-2 for these two groups. The distribution of reported age at infant death in the MFLS-2 data follows the expected pattern, with the majority of deaths reported to have occurred within the first several months of birth. Accurate data on fetal mortality are extremely difficult to obtain retrospectively, and such events appear to be significantly underrepresented in the MFLS-2 data as they tend to be in other fertility history data.

Birthweights were reported in pounds and ounces for over 90 percent of births reported by MFLS-2 New Sample women. The distribution of birthweights for these births tracks the distribution of birthweights from VS data but does not match exactly. It is noted that the quality of VS birthweight data may be suspect. Birthweight reports in VS sources represent only 57 percent of all births that occurred in Peninsular Malaysia in the year examined, and the omitted births do not appear to be only non-hospital births (as claimed by Malaysian sources). Thus differences between VS and the MFLS-2 curves more likely reflect the fact that the MFLS-2 data are a representative sample of Peninsular Malaysian births while the VS data may not be.

Almost three-fourths of MFLS-2 New Sample women reported ever having used a contraceptive method. This figure compares well with other data sources. Among users, the MFLS-2 sample shows more use of efficient
contraceptive methods, with much of the difference accounted for by a higher reported prevalence of pill use. Several factors may contribute to this difference. First, the MFLS-2 estimates were based on retrospective answers to questions that required subjects to recall what they were doing several years earlier, while the Malaysian Population and Fertility Survey estimates were based on reports about current behavior (no recall was required). There may be a tendency for women in 1988 and 1989 to overreport use of methods they thought to be the more socially acceptable methods. Additionally, differences in age structures of the two samples may account for some of the differences observed. The distributions of methods used by MFLS-2 contraceptive users in 1985 and users at the time of survey are very similar; about two-thirds of contraceptive users in each survey reported using efficient methods.

As expected, Malay women were much more likely to report having breastfed their children compared with Chinese and Indian women. This was true of both the MFLS-2 data and the comparison data. The MFLS-2 data exhibited a noticeable digit preference in reported duration of breastfeeding, a pattern not uncommon in retrospective data sets.

The MFLS-2 data show that educational attainment of Malaysian women has increased over time, which is consistent with information available from Malaysian census reports. The relative educational status of the three major ethnic groups has changed over time as well. Whereas among older women, Malays were the least educated, among younger women they are the most educated. This is consistent with known governmental educational policies that promoted educational development, particularly in rural areas where the Malay population predominates.
ACKNOWLEDGMENTS

We would like to thank Julie DaVanzo, Tey Nai Peng, and John Haaga for their advice and support. We are most grateful for the careful review by our RAND colleague Constantijn Panis. Zachary Mahler provided assistance with the graphics and Gloria Gowan provided secretarial support.
1. INTRODUCTION

Retrospective survey data are often collected to shed light on social trends of interest to policymakers and researchers. There are several advantages of collecting retrospective data for studying trends when compared with the principal alternative, panel surveys. Retrospective surveys are generally cheaper, and the time between survey fielding and data availability is considerably shorter. On the other hand, retrospective surveys are vulnerable to certain biases that raise concern about the quality of their data. These concerns should be addressed before such data are used.

The quality of data from the Female Life History questionnaire collected from New Sample respondents to the Second Malaysian Family Life Survey (MFLS-2) is assessed in this report. The MFLS-2 is a retrospective survey that was fielded between August 1988 and January 1989 in Peninsular Malaysia. Haaga (1986a) reported on the accuracy of similar data collected as part of the First Malaysian Family Life Survey (MFLS-1) in 1976. He found that, in general, MFLS-1 data compared well with data from other sources and concluded that the data quite accurately reflected true demographic and social characteristics of the Peninsular Malaysian population at that time. The data were therefore found to be appropriate for studying demographic and social trends.

Although the MFLS-2 benefited heavily from experience gained in collecting and analyzing MFLS-1, there are reasons to independently assess the validity of these new data. Foremost among these reasons are several key differences between the MFLS-2 and the MFLS-1. The most important differences are: (1) the MFLS-2 was fielded completely in one round, while MFLS-1 was fielded in three; and, (2) the MFLS-2 sampled all women, regardless of marital status, between ages 18 and 49 (and a sample of ever married women between ages 15 and 17) while only ever married women were sampled for MFLS-1.

In this report, we are primarily concerned with data gathered from New Sample respondents (women aged 18 to 49 and ever married women aged 15 to 17) to the Female Life History questionnaire, MFLS-2. (DeVanzo et
al., 1993, presents the final questionnaire used in MFLS-2.) Validity of similar data collected from the Panel Sample (women who participated in the MFLS-1) is being investigated elsewhere. Reinterviews with these women permit comparison of responses to similar questions given 12 years apart. Those results will appear in a separate future publication.

There are two principal methods that can be used to assess the validity of any data. First, trends in the data may be examined to determine whether or not they follow expected patterns. For instance, we know that infant mortality rates in Malaysia have declined considerably since independence (1957); therefore, if the MFLS-2 data are valid, they should exhibit this trend. Second, the data can be compared with data from other sources. Other sources may include more complete population-based records, such as national censuses and vital statistics documents. Other surveys may also be used, with the caveat that discrepancies may indicate data quality problems in either the MFLS-2 or the comparison surveys.

Section 2 provides a brief description of the MFLS-2 survey. Sections 3 through 9 present our analysis of the following topics: marital status, fertility, infant and fetal mortality, birthweights, contraception, breastfeeding, and education. Each section begins with general comments about the policy relevance of the data. Potential problems, as suggested by survey researchers, and the assessment methods we use will be outlined next. Each section concludes with results from those examinations, along with our conclusions about the data’s validity. Overall findings and conclusions are summarized in the final section of the report.
2. THE SECOND MALAYSIAN FAMILY LIFE SURVEY (MFLS-2)

The MFLS-2, fielded in late 1988, was a collaborative project between RAND and the National Population and Family Development Board of Malaysia (Lembaga Penduduk dan Pembangunan Keluarga Negara, or LPPKN). It was supported by the United States National Institute of Child Health and Human Development and the National Institute on Aging. A more complete overview of the MFLS-2 is provided by Haaga et al., (forthcoming).

Primarily, the survey was a follow-on to the 1976-1977 MFLS-1 and was designed to provide data for the study of household behavior over a period of rapid demographic and socioeconomic change in Malaysia. The second survey, administered more than a decade after the first, permits study of persistence and change in Malaysian household economics, behaviors, and decisions.

PURPOSE AND DESIGN

The MFLS-2 is composed of four samples. Expansion of the scope of the survey reflects both the wish to study social and demographic changes since the time when MFLS-1 was fielded and new issues of interest to researchers and policymakers in Malaysia, the United States, and elsewhere. The four MFLS-2 samples are

1. New Sample--women aged 18-49 in 1988, regardless of marital status, and ever-married women 15 to 17 years old, for a total of 2184 respondents. (The sample used in this report.)

2. Senior Sample--1357 men and women aged 50 or older were included in this sample. This sample was added to allow study of the growing population of aged Malaysians.

3. Panel Sample--889 female primary respondents to the MFLS-1 in 1976 (72 percent of those eligible from the original 1262) still living in Peninsular Malaysia were located and interviewed.

4. Children Sample--one child, aged 18 and older, still living with Panel Sample respondents and up to two no longer living in the same household were interviewed, for a total of 1096 respondents. Children were randomly selected for interview when more than the desired number were eligible. This group was added because of
interest in studying changes in household structure and in economic roles for younger adults.

Seven instruments were used to collect MFLS-2 information. In this report, we focus mostly on data from the Female Life History instrument (MF22). It was administered to women in the Panel, Children, and New samples, as well as to wives of male primary respondents in the Children sample. The analyses in this report are restricted to the New Sample, since that sample was selected to be representative of women of reproductive ages. The Panel Sample is restricted to women who were ever married as of 1976. Its representativeness is further limited by attrition between the surveys. (The selectivity of this attrition is analyzed by Haaga et al., forthcoming.)

**SAMPLING**

Sampling for the MFLS-2 New Sample was carried out in two stages.¹ Malay and Chinese LQs were selected in proportion to their share of the 1980 Peninsular Malaysian population. Indian LQs were sampled at twice the rate of Malay and Chinese LQs in order to ensure a sufficiently large sample size for ethnic-specific analyses. (Indians compose only 10 percent of the Peninsular Malaysian population.)

Interviewers visited each selected LQ to list residents eligible for the New Sample. Interviews were completed in 81 percent of households (2184/2696) containing at least one female eligible for the New Sample. In households where there was more than one eligible female (that is, women aged 18 to 49 and ever-married women aged 15 to 17), one was randomly chosen to be the primary respondent.

Sampling weights have been created to make the New Sample data representative of the Peninsular Malaysian population of women aged 18-49 in 1988. These weights, WHEIGHT (for the entire New Sample) and

---

¹In Stage I, 401 Enumeration Blocks (EBs) were randomly selected from a list of 2500 EBs covering Peninsular Malaysia. (An EB is a geographical area, defined by the Statistics Department of Malaysia, containing about 100 living quarters (LQs).) In Stage II, 3063 LQs were selected from a list of all LQs in these 401 EBs. (Randomly selected LQs were contained in 398 of these 401 EBs.) This LQ list was then stratified by ethnicity of LQ occupants.
EWEIGHT (for the subsample of ever-married women in the New Sample) account for the oversampling of Indians and for the fact that some households contained more than one woman eligible for the New Sample. All tabulations in this report designed to represent population estimates (either in total or ethnic specific) are weighted using either WWEIGHT or EWEIGHT, depending on the topic being studied.

While the New Sample is representative of women aged 18 to 49 in Peninsular Malaysia in 1988, it becomes progressively less representative as one proceeds backward in time. This results from several factors. First, the experiences of older women in any given year earlier than 1988 are omitted. For example, women who were 45 to 49 years old in 1988 (the oldest women in the New Sample) were 35 to 39 years old in 1978. The experiences of women who were 40 to 49 in 1978, therefore, are not included in the New Sample data. (Such women are covered, however, by the MFLS-2 Panel and Senior samples.) This biases any analyses of trends and events in earlier years toward the experience of younger women, with the potential for bias increasing as one proceeds backward in time. Analysis of age-specific data has been carried out wherever similar comparison data existed in order to reduce the impact of such bias. In some cases, we restricted the MFLS-2 sample so that its age composition was similar to that for the comparison data.

Two other sources of nonrepresentativeness in analyses conducted for pre-1988 years are death and migration. The experiences of women who died prior to sampling are not captured, since they were not included in the sample frame. Similarly, women who migrated away from Peninsular Malaysia are not represented. To the extent that these women's experiences may be different from those in the sample frame, analyses based on MFLS-2 data could be biased. However, mortality among childbearing-aged women is low in Malaysia and official government sources indicate that emigration from Peninsular Malaysia is minimal. Therefore, we expect these sources of bias to have minimal impact on our analyses.
3. MARITAL STATUS

IMPORTANCE AND POTENTIAL PROBLEMS

Marriage marks the beginning of exposure to family formation in most societies. Consequently, marriage trends have important effects on fertility, contraception decisions, labor markets, and other social phenomena. Quality of marriage data, therefore, is important to many researchers who may use the MFLS-2. Of particular importance is the accuracy with which female respondents retrospectively report their marriage histories.

Some researchers have asserted that older women tend to report marriage dates as having occurred later than they actually did (i.e., closer to the time of the interview) (Blanc & Rutenberg, 1990). This type of reporting bias would cause estimates of the mean age at first marriage among older women to be biased upwards. This upward bias would attenuate any true increasing trend in age at first marriage, making it more difficult to detect. A woman who misreports her age at first marriage may also misreport the birth dates of her older children. Fertility estimates for earlier periods covered by the data would therefore be biased downwards as some births are displaced forward into adjacent time periods. Again, this would make true decreasing fertility trends more difficult to recognize (discussed in Section 4).

In the marriage section of the MF22 questionnaire, New Sample respondents were asked questions about age at first marriage and number of marriages, followed by several questions about each marriage, proceeding forward in time from the first marriage. At the conclusion of this section, the interviewer compared the number of marriages originally reported with the number described. Respondents were probed further if there was a discrepancy.

The following topics were analyzed to assess the quality of MFLS-2 marriage data:

These were compared, by five-year age cohorts, with decennial census report data for 1970 and 1980, and with data from the 1984/5 Malaysian Population and Fertility Survey (MPFS). The four MFLS-2 distributions were also compared to each other to examine trends within the data.

2. **Mean age at first marriage**—by five-year age cohorts of MFLS-2 New Sample respondents, this was compared with MPFS data. We expected to see a trend toward later marriage among younger women in both surveys.

3. **The mean age at first marriage**—by ethnic group we expected to find evidence that Chinese women historically have married later than Malay and Indian women, but that the gap has narrowed over time.

**MARITAL STATUS DISTRIBUTION**

In Figure 1(a), the marital status distribution of New Sample women in 1985, as inferred from their marriage histories, is compared with data from the MPFS (Arshat et al., 1988). Similar comparisons are shown in Figures 1(b) and 1(c) for 1980 and 1970, using data from the Peninsular Malaysian decennial censuses for those years.

For the 1985 comparison in Figure 1(a), a higher percentage of MFLS-2 women reported having ever been married than MPFS women (34 percent versus 26 percent among 15 to 24 year olds). A similar pattern emerges when status of MFLS-2 women in 1980 is compared with data from the 1980 Malaysian census report in Figure 1(b). As seen in Figure 1(c), the MFLS-2 data compared quite well with 1970 census report data (which only permitted analysis according to a dichotomous dimension,

---

2 The MPFS consisted of a household survey and an individual survey fielded in Peninsular Malaysia between November 1984 and December 1985. The household survey collected basic demographic information on each household member while the individual survey collected more detailed information from ever married women age 15-49 in the household. The individual survey covered nuptiality, fertility, and family formation questions. The marital status distribution shown here was derived from MPFS roster data.
single versus ever married), suggesting that MFLS-2 marriage data are high quality, even for more distant retrospective events.

Figure 1(a)—Marital Status Distribution in 1985 of Malaysian Women, by Age Group in 1985 (MFLS-2 vs. MPFS)

Figure 1(b)—Marital Status Distribution of Malaysian Women in 1980, by Age Group in 1980 (MFLS-2 vs. 1980 Census)
Figure 1(c) — Marital Status Distribution of Malaysian Women in 1970, by Age Group in 1970 (MFLS-2 vs. 1970 Census)

The cause of the higher proportion of ever married women in MFLS-2 data for the 1980 and 1985 comparison is uncertain. The MFLS-2 New Sample may overrepresent married women because only private households were sampled. Using data from pregnancy histories, we found that at the time of the survey, adult female children of New Sample respondents were more likely to have been living "away" from home than male children (39 percent versus 27 percent). Among younger cohorts, sampling only private households biases the sample toward those with a propensity to marry younger and remain in more traditional living arrangements.

Such sampling bias increases for MFLS-2 as we approach the time of survey because two trends have increased the proportion of young, single women who live in non-traditional housing. First, an expanding industrial sector encourages young women to migrate in order to take advantage of new employment opportunities. Expansion of industrial employment opportunities was greatest in the several-year period immediately preceding MFLS-2 interviewing. Indeed, the discrepancies
between MFLS-2 data and the comparison data are greatest in the youngest age group.

Second, with near universal education now a fact in Malaysia, an increasing proportion of young people go on to secondary school and to institutions of higher education. Geographic conditions require that many of these students live in hostels (personal communication, LPPKN, October 1990). The experience of these women is not included in MFLS-2 data. (This has important implications for fertility estimates; these are discussed in Section 4.) The MPFS also sampled only private households; however, given that the three years between data collection for the MPFS and the MFLS-2 saw the greatest expansion in new employment opportunities for young women, it is likely that more young, single women were available for the MPFS sample frame.

Figure 1(d) shows the marital status distribution of New Sample respondents at the time of interview (1988). Please note that because of the MFLS-2 sample selection criteria the minimum age in 1988 in Figure 1(d) is 18, rather than 15 as depicted in Figures 1(a)-1(c). When compared with MFLS-2 data in Figures 1(a), 1(b), and 1(c), expected trends are apparent. That is, at each successively older age cohort for each of the four points in time, the prevalence of having ever been married rises.

![Marital Status of Malaysian Women at Time of Survey (1988)]
AGE AT FIRST MARRIAGE

Figure 2 compares the MFLS-2 and MPFS trends in age at first marriage for women aged 25 and older who had married by age 25. In order to be consistent with the MPFS presentation of this data, we consider only New Sample women who were at least 28 years old at the time of the MFLS-2 survey (i.e., at least age 25 in 1985) and were ever married as of the beginning of 1985.³

Although the mean age at first marriage for each birth cohort is lower for MFLS-2 women, an increasing trend is clear in both samples. This difference is consistent with the difference noted above between the marital status of MFLS-2 New Sample women and respondents of other surveys. MFLS-2 women in younger age cohorts consistently reported themselves as more likely to be married when compared with women in the MPFS and with the 1980 census report; this is consistent with a lower mean age at first marriage. Underrepresentation of young, single women in the MFLS-2 sample appears to be biasing the reported age at first marriage downward.

³MPFS selected age 25 for their analysis to compensate for possible truncation bias that could occur in the youngest age cohort of women in its sample. Please refer to Appendix 2 in the Analytic Report of the MPFS (Arshat et al., 1988) for a detailed discussion.

Figure 2—Age at First Marriage, by Birth Cohort
(Women Aged 25 and Older in 1985 Who Married by Age 25)
The problem of selectivity bias in younger age groups is probably more severe in the MFLS-2 because increasing industrialization in Malaysia over the three years between the two surveys expanded job opportunities for women. Young women are more likely to have been living in institutional settings away from home, biasing the sample toward women who married young and stayed home.

Blanc and Rutenberg (1990) have described a problem among older cohorts of women in which the age at first marriage is reported as having occurred later than the actual date. Since both the MFLS-2 and the MPFS were retrospective surveys, we cannot determine to what extent forward displacement in time of age at first marriage is present in the MFLS-2. However, if the MPFS suffered from such a systematic bias, then it appears that this bias was at least less severe in the MFLS-2 data. (Reported age at first marriage is lower for older MFLS-2 women compared with the same cohort in the MPFS.) The MFLS-2 perhaps did not suffer as much from this problem because strong efforts were made to prompt women for correct dates (e.g., interviewers prepared and referred respondents to a calendar of surrounding events during questioning).

ETHNIC DIFFERENCES IN AGE AT FIRST MARRIAGE

Figure 3 presents age at first marriage separately for the three major ethnic groups in Peninsular Malaysia. As expected, a trend toward later marriage is noticeable, especially for Malays and Indians. Chinese women marry considerably later than Malay and Indian women for all birth cohorts. The mean age at first marriage is similar for Malay and Indian women in all birth cohorts except for the 1955-1959 one, in which the Indian age at first marriage exceeds the Malay age by nearly one year.

The gap between Chinese and each of the other two ethnic groups narrows considerably as we move toward the later birth cohorts. Chinese women born between 1940 and 1944 married an average of over three years later than Malay and Indian women of the same age group. Among women born between 1960 and 1962, the difference between Chinese and the other two ethnic groups drops to a half year.
Figure 3—Ethnic Differences in Trends in Mean Age at First Marriage (MFLS-2 New Sample Women Aged 25 or More, Who Marry by Age 25)

The drop shown in the age at first marriage among Chinese women is surprising. It may be that there is a group of early marriers for whom age at first marriage did not change much over time (e.g., less educated women). As other women marry at progressively older ages through time, more of these women are excluded from the sample constructed here, biasing the sample increasingly toward the early marriers’ group and causing the computed mean age at first marriage to drop. Additionally, the last point plotted in Figure 3 represents the age group for whom the question of institutional living and selection bias arises. To the extent that women in this age group are more likely to live in an institutional setting, women in this age group who appear in the MFLS-2 data are more likely to be women who married young; i.e., the sample may underrepresent young, single women.

These differences are important because differences in marriage patterns may explain ethnic variation in fertility rates that researchers may explore using MFLS-2 data.
4. FERTILITY

IMPORTANCE AND POTENTIAL PROBLEMS

Malaysia has experienced rapid economic and social changes since independence in 1957, and evidence suggests that a demographic transition is well under way. Study of fertility trends is thus particularly relevant for policymakers at this time, and pregnancy histories are likely to be one of the more important components of the Female Life History data. At a time when fertility patterns may be undergoing considerable change, data quality issues take on added significance. Birth and birth date reporting are crucial to estimating fertility rates; these two issues have been raised as potential problem areas with retrospective data (Arnold, 1990).

First, birth date reporting may be less complete for early births and for children who died, especially those who died very soon after birth. Incomplete birth date reporting may make it difficult to assign a birth to the proper period for fertility rate calculations; the bias thus introduced could be in either direction. Second, some births may not be reported at all. Of particular concern here is the propensity in some cultures for female births to be underreported. This would cause fertility rates to be underestimated.

Pregnancy histories were elicited from New Sample respondents using a method similar to that described in the previous section on marriage. Women were first asked the number of living children, number of deceased children, and the number of pregnancy losses to get the total number of pregnancies they had experienced. Beginning with the first pregnancy, questions were then asked about each pregnancy. Any discrepancy between the number of pregnancies initially reported and the number for which detailed information was provided was probed at the conclusion of the pregnancy history questionnaire. In addition, interviewers checked the completed pregnancy history for any long gaps between pregnancies. If a husband was present during the period and contraceptives were not being used, interviewers were instructed to probe the respondent for the
possibility of overlooked pregnancies. For each reported live birth, the interviewer attempted to verify the information provided by examining a birth certificate or an identity card, if it was available.

Data relevant to fertility rate calculations have been assessed as follows:

1. **Birth date reporting**

   a. The percentage of reported births for which a birth certificate was produced for interviewer examination was calculated for each five-year period covered in the pregnancy histories. Higher percentages indicate higher data quality because birth certificates are assumed to have the complete and accurate birth date recorded.

   b. The percentage of births, by decade, where no information was missing, where only month was missing, and where month and year were missing also serve as data quality indicators. The more information that is missing, the more difficult it is to impute a birth date. Mother’s age at the time of birth helps to impute a birth date when month and year of birth are missing, so the percentage of births where mother’s age is missing is also determined. Performance of other surveys on these measures serves as a standard for comparison.

2. **Birth reporting**—sex ratios of births are calculated by decade of birth and ethnicity of the mother. Any systematic underreporting of female births would show up as a statistically significant difference from the virtually universal biological standard of 104 to 106 male births for each 100 female births.

3. **Number of children born per woman**—there is good comparison data from Malaysia on this measure. Discrepancies would indicate possible overreporting or underreporting of live births. They may also serve as indicators of misreporting of the timing of births.
4. **Age-specific fertility rates**—this measure permits a closer look at the accuracy of reported timing of births. Rates calculated from MFLS-2 data are compared with rates calculated from data in Vital Statistics annual reports.

**BIRTH DATE REPORTING**

**Birth Certificates**

A birth certificate was available for interviewer inspection for 45 percent of all live births (2775 out of 6166 births) reported by New Sample respondents (Table 1). No comparative material on birth certificates is available from other surveys. As expected, birth certificates were shown less often for births occurring in the more distant past. It is likely that this is because of poorer official birth registration in the past. However, even for births that occurred closer to the time of interview, only about half were verified by birth certificate. Upon debriefing, interviewers reported that most respondents seemed to report exact birth dates of their children with confidence. In many cases, documents were not readily available (e.g., they were locked in safe deposit boxes outside the home). In other cases, interviewers apparently found it embarrassing to question the respondent's answers when the respondent was so certain of the date and did not ask to see the documents.

**Table 1**

<table>
<thead>
<tr>
<th>Period</th>
<th>% with Birth Certificates</th>
<th># of Births</th>
</tr>
</thead>
<tbody>
<tr>
<td>1955-59</td>
<td>11</td>
<td>73</td>
</tr>
<tr>
<td>1960-64</td>
<td>16</td>
<td>267</td>
</tr>
<tr>
<td>1965-69</td>
<td>23</td>
<td>539</td>
</tr>
<tr>
<td>1970-74</td>
<td>44</td>
<td>898</td>
</tr>
<tr>
<td>1975-79</td>
<td>49</td>
<td>1329</td>
</tr>
<tr>
<td>1980-84</td>
<td>53</td>
<td>1683</td>
</tr>
<tr>
<td>1985-88</td>
<td>50</td>
<td>1377</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>45</strong></td>
<td><strong>6166</strong></td>
</tr>
</tbody>
</table>
Missing Month and/or Year of Birth

Compared with other recent retrospective surveys done in Asia, the quality of MFLS-2 data is at least as good. In other surveys, about six percent of birth dates are reported without a month of birth and two percent are reported without the month or the year of birth. Table 2 summarizes findings on completeness of birth date reporting for MFLS-2. It shows that not only are birth dates less verifiable for earlier births (Table 1), they are reported less completely as well.

Table 2
Completeness of MFLS-2 Birth Date Reporting:
Percentage of Cases with Missing Information

<table>
<thead>
<tr>
<th>Decade of Child’s Birth</th>
<th>Month Only Missing</th>
<th>Month &amp; Year Missing</th>
<th>Month, Year, &amp; Mother’s Age Missing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960s</td>
<td>24</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>1970s</td>
<td>6</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>1980s</td>
<td>1</td>
<td>&lt;1</td>
<td>0</td>
</tr>
<tr>
<td>All births</td>
<td>6</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

The MFLS-2 outperformed other surveys on one key dimension, the reporting of mother’s age at the time of her children’s births. There were no instances where this information was missing for live births.\(^4\) The degree to which this is useful depends on the intended use of the data. If they are to be used to calculate five-year average fertility rates, then these data are sufficient to impute the child’s year of birth; failing to know the child’s month of birth will not seriously affect fertility rates. If, on the other hand, the data are to be used to study birth intervals (such as time between births and contraception, for instance), then failure to know the child’s month of birth is a more serious problem.

BIRTH REPORTING (SEX RATIO OF BIRTHS)

Calculating sex ratios of births provides an indication about completeness of birth reporting. Any systematic tendency for

\(^4\)A few non-live births (e.g., miscarriages) have no specific outcome date or age of woman at outcome.
respondents to fail to report births of one gender will cause the computed ratio to deviate from the true ratio. Sex ratios of births are remarkably stable across time and place, making this data quality test one of the easiest to interpret. Any significant difference from the biological standard (about 104 to 106 male births to each 100 female births) is an indication of underreporting or overreporting of one gender. In Malaysia, if there were any underreporting or overreporting at all, we would expect female births to be underreported. This would most likely occur among Chinese where there is a preference for male children.

Haaga (1986a) found no evidence of underreporting of female births in the MFLS-1 data. Although there is no reason to believe that Malaysian women would be more likely to underreport female births now than a decade earlier, we computed the sex ratio of births using MFLS-2 data and compared it to Malaysian VS data, which are considered to be of very high quality. Sex ratios of live births were aggregated by decade in order to smooth some of the year-to-year random variation that may occur in small samples. These findings are summarized in Table 3. A standard t-test for the difference between two ratios was done to determine if the ratio pairs were significantly different from each other.

Table 3

Sex Ratio of Live Births Reported in MFLS-2 and Vital Statistics, by Year of Birth and Ethnicity
(number of male births per 100 female births)

<table>
<thead>
<tr>
<th>Year of Birth</th>
<th>Malays</th>
<th>Chinese</th>
<th>Indians</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MFLS-2</td>
<td>VS</td>
<td>MFLS-2</td>
</tr>
<tr>
<td>1961-70</td>
<td>122</td>
<td>104</td>
<td>107</td>
</tr>
<tr>
<td></td>
<td>(469)</td>
<td>(233)</td>
<td>(190)</td>
</tr>
<tr>
<td>1971-80</td>
<td>99</td>
<td>106</td>
<td>88 [+]</td>
</tr>
<tr>
<td></td>
<td>(1292)</td>
<td>(639)</td>
<td>(449)</td>
</tr>
<tr>
<td>1981-88</td>
<td>105</td>
<td>109</td>
<td>112</td>
</tr>
<tr>
<td></td>
<td>(1701)</td>
<td>(512)</td>
<td>(500)</td>
</tr>
</tbody>
</table>

Numbers in parentheses are the total number of live births for each MFLS-2 cell.

[+]: difference between the MFLS-2 and VS ratios is significant at p < 0.05.
Ratios for the 1981-1988 period for the MFLS-2 sample are quite similar to VS ratios. In absolute terms, the greatest discrepancies occur in the 1961-1970 period. However, the MFLS-2 sample sizes are small and none of these differences are statistically significant. In the 1971-1980 period, the MFLS-2 ratio for Chinese births is significantly lower (p < .05) than the VS ratio. However, the direction of the difference is opposite of expectations; that is, female births appear to be overreported rather than underreported. It may be that some males who died were not reported as live births or that some stillborn babies were reported as liveborn. In order to test for these possibilities, we examined the sex ratio of child deaths and the proportion of all births that were reported as stillbirths (results not shown here). In both cases, we found the data from MFLS-2 to be comparable to VS data. Thus, we consider it unlikely that the noted differences in sex ratio of births is due to misreporting of males who were either stillborn or who died in infancy.

**NUMBER OF CHILDREN BORN PER WOMAN**

Figures 4(a), 4(b), and 4(c) compare the average number of children born to New Sample women, by age group, in 1970, 1980, and 1985, with the average number reported in 1970 and 1980 censuses, and the MPFS. In order to make these comparisons, subsamples of the MF22 data were constructed of women who had ever been married in the respective comparison years. The subsamples included only births to these women that occurred up to and including the anchor year for each comparison.

The average number of children born to MFLS-2 New Sample respondents is similar to the comparison data for each of the three years studied. The exception is that the youngest MFLS-2 women in each period tended to report more live births than women in the comparison samples. However, 95 percent confidence intervals on the MFLS-2 means for children ever born encompass the comparison means in all cases, thus the observed differences are not statistically significant.
Figure 4(a)—Mean Number of Children Ever Born to Ever Married Women, by Age Group in 1985 (MFLS-2 vs. MPFS)

Figure 4(b)—Mean Number of Children Ever Born to Ever Married Women, by Age Group in 1980 (MFLS-2 vs. 1980 Census)
To summarize, we find no evidence of underreporting or overreporting of live births. This analysis also fails to identify possible systematic misreporting of timing of birth events. Fertility rates, however, are a better measure, and these are examined next.

AGE-SPECIFIC FERTILITY RATES

An age-specific fertility rate is defined as the mean number of infants born alive per 1000 women within a five-year age range in a given year. In Figure 5, MFLS-2 rates are compared with rates calculated from various Peninsular Malaysian VS annual reports. Our analysis examines three five-year periods, beginning in 1971.
The MFLS-2 curve on each graph actually represents a five-year average fertility rate for that period. The two VS curves in each graph were constructed based on the reported number of total births to Peninsular Malaysian women, by age group of the mother, divided by the total midyear population of women in each age group for the beginning and ending year of each five-year period.

For each period, the MFLS-2 curve follows the general pattern seen for the VS curves. That is, fertility increases with age, peaking among women aged 25 to 29, and declines steadily thereafter. The VS curve for the last year in each period lies below the VS curve for the first year, suggesting that the fertility rates have been declining in Peninsular Malaysia. We would expect, therefore, that the resulting observed MFLS-2 rates would fall between the actual rates for the beginning and ending years for each period. However, the rate of births reported by MFLS-2 respondents appears to be too high for most age groups, particularly in the later two periods.

In the 1981-1985 period, the MFLS-2 curve is higher than either of the VS curves for each age group. The differences are greater the younger the age, except for the 25-29 age group. The same is true for the 1976-1980 period, though the MFLS-2 curve is closer to the VS curves than it is in the 1981-1985 period. The MFLS-2 curve generally lies between the VS curves for 1971 and 1975.

A possible explanation for this observed high-fertility pattern is that single women are underrepresented in the MFLS-2 sample. (Evidence for this was seen in the previous section on marital status.) The denominator for the fertility rates considered here is the reported population of all women in each age group, regardless of marital status.

---

5 Formula for computing five-year average, age-specific fertility rates from MFLS-2 data:

\[
\text{5-Year Avg. Fertility Rate} = \frac{[B(i,j) + \ldots + B(i + 4, j + 4)]}{[W(i,j) + \ldots + W(i + 4, j + 4)]} \times 1000
\]

Where: \( B(i,j) = \# \) of births in year \( i \) to women aged \( j \) in year \( i \); \( W(i,j) = \# \) of women aged \( j \) in year \( i \).
and regardless of residence. As noted earlier, the MFLS-2 sample frame, on the other hand, included only private households in Peninsular Malaysia. Institutional housing (such as hostels for educational and industrial institutions) was not sampled. The MFLS-2 sample may be biased toward women who are more likely to be married (women living in private households are presumed more likely to be married than women living in institutional housing).

Fertility rates calculated from such data should be higher than true population fertility rates because single women are underrepresented in the denominator of the formula. These women are least likely to be living in institutional settings, and the MFLS-2 sample is therefore more representative of the true population.

In order to test the plausibility of this explanation, we calculated marital fertility rates (it is unlikely that many married women would be living in institutional housing) and compared these with marital fertility rates as reported in 1970 and 1980 census reports. This is shown in Figure 6 for each of the major ethnic groups. We used the same formula described above, calculating ten-year average marital fertility rates instead of five, by age group, and plotting this curve against 1970 and 1980 curves constructed from census report data and reported in a Department of Statistics publication, "Population Projections* (1987)."  

The MFLS-2 marital fertility curves lie very close to, though slightly lower than, the census report curves. This suggests that the higher MFLS-2 fertility rates observed on the full number of New Sample women (regardless of marital status) is indeed attributable to underrepresentation of single women.

---

6This analysis was conducted separately for each of the three major ethnic groups in Peninsular Malaysia so that it could be compared with the Department of Statistics data, which were not published for the combined population.
Figure 6—Age-Specific Marital Fertility Rates
By Ethnic Group, 1970-1980
(MFLS-2 vs. Censuses)
5. INFANT AND FETAL MORTALITY

IMPORTANCE AND POTENTIAL PROBLEMS

Infant mortality is an important indicator of health status of a population, especially among children. Information about it, therefore, plays an important role in many public policy decisions about maternal and child health, family planning, and community health programs. Retrospective data such as those contained in the MFLS-2 are especially useful because their richness permits linkage of infant mortality with many important correlates, such as household and community characteristics.

The main concern with retrospective data on infant mortality is that there may be disproportionate underreporting of children who died, especially among girls and for children who died further back in time. Accuracy of reports about age at children’s deaths is also a concern (Sullivan, Bicego, and Rutstein, 1990). Obtaining accurate information may be difficult since some women may avoid painful discussion of child deaths and preterm pregnancy terminations by simply not reporting such pregnancies. Additionally, it may be that more distant events are recalled with greater difficulty. (For instance, some early infant deaths may be mistakenly recalled or reported as stillbirths.)

The MFLS-2 questions about child births and deaths were similar to those in MFLS-1. Each woman was asked a series of questions about each pregnancy, beginning with her first. She was asked where each live-born child was at the time of the survey. If the child was reported as having died, the respondent was asked the child’s age at death. In order to ascertain fetal deaths, respondents were also asked about pregnancies that did not result in live births.

The following methods were used to assess data on infant and fetal mortality:

1. Infant mortality rates (IMRs)--three-year moving averages were calculated for the entire sample of births reported in MFLS-2 and
for each ethnic group separately.\textsuperscript{7} Five-year moving averages were also calculated for Chinese and Indian groups to increase precision of these estimates (MFLS-2 sample sizes were small). These averages were plotted against IMRs reported in VS reports for the period from 1968 to 1986. Any underreporting of deaths would cause the MFLS-2 curve to fall below the VS curve.

2. \textbf{Age at Death}--the distribution of reported age at death for infant deaths was plotted to assess the pattern. The great majority of infant deaths occurs very soon after birth and the distribution should have a long right-hand tail. Any deviation from this pattern would indicate a problem with reporting of age at death.

3. \textbf{Fetal mortality rates}--spontaneous and induced abortion rates calculated from MFLS-2 data were compared with MPFS data and data from the 1973 Federation of Family Planning Associations (FFPA) survey.\textsuperscript{8} Lower MFLS-2 rates would indicate that the MFLS-2 did not do as well in eliciting this information from women. Higher rates would indicate that MFLS-2 was more successful.

4. \textbf{Percentage of women ever experiencing pregnancy wastage}--this was calculated by five-year age cohorts from the MFLS-2 New Sample. Trend lines should be increasing with increasing age; that is, more older women should have experienced abortions and miscarriages as compared with younger women. Deviations from this

\textsuperscript{7}Three-year moving average infant mortality rates were calculated as follows:

\[
IMR(i) = \frac{D(i - 1) + D(i) + D(i + 1)}{B(i - 1) + B(i) + B(i + 1)} \times 1000
\]

Where: IMR(i) = three-year average infant mortality rate for years (i - 1), (i), and (i + 1);

\(D(i) = \# \text{ of infant deaths in year (i), and } B(i) = \# \text{ of live births in year (i).}\)

\textsuperscript{8}The FFPA survey was conducted in 1973. FFPA survey data reported here were taken from Haaga's 1986a study of MFLS-1 data quality.
pattern would suggest possible underreporting in a particular age group.

INFANT MORTALITY RATES

Figure 7 shows the three-year moving average for infant mortality for all births to New Sample women, compared with VS rates from 1968 to 1986. Figures 8 shows the same comparisons for each of the three major ethnic groups in Peninsular Malaysia. The numerator of Vital Statistics IMRs contains the number of deaths to infants aged 12 months or less in a given year; the denominator contains the number of live births occurring in the population in that same year. For comparability, MFLS-2 IMRs were calculated using the same formula, even though some infants dying in a given year may have been born in the previous year.  

![Figure 7—Infant Mortality Rates in Malaysia, 1968-1986](image)

[We also calculated IMRs from MFLS-2 data using linked births and deaths. The resulting curve looked nearly identical to that shown in Figure 7. When moving averages are used, as they were here, most births and deaths will be included in the same data point, regardless of the method used to calculate the IMR.]
Figure 7 shows a substantial decline in IMRs for the total sample in both MFLS-2 and VS data with the two curves tracking together closely. The top panel in Figure 8 shows the MFLS-2 and VS trends for Malays to be remarkably similar as well, except for the period covering the late 1960s, where the MFLS-2 rates are considerably higher than the VS rates. The higher MFLS-2 IMRs for Malays in the earlier years include only the experience of young mothers (the oldest New Sample woman, for example, in 1968 was only 29 years old); this age bias in the sample may explain some of the difference. Infant mortality rates are high for very young mothers (age < 18), then decrease with age, rising again for older mothers (age > 40). Since the MFLS-2 had only mothers aged 29 or less in those earlier years, the low infant mortality experiences of mothers aged 30-39 is not represented, resulting in a higher infant mortality rate than observed in VS data. It may also be that the MFLS-2 did, in fact, do better than VS in capturing this information. One might expect that official sources had more difficulty in the past in recording vital events, perhaps more difficulty than an interviewer would have asking a woman to recollect such events.

The graphs for Chinese and Indians, the lower two panels in Figure 8, do not compare as well with their respective VS curves, but sample sizes tend to be very small. For this reason, the analysis was repeated using five-year moving averages from the MFLS-2 data. These curves, compared with their respective VS curves, are shown in Figure 9 separately for Chinese and Indians. A downward trend in the IMRs from the MFLS-2 is more apparent here, though still not strongly so.
Figure 8—Infant Mortality Rates by Ethnic Group, 1968-1986
(MFLS-2 is three-year moving average)
Figure 9—Chinese and Indian Infant Mortality Rates, 1968-1986
(MFLS-2 is five-year moving average)
Overall, infant mortality in Malaysia has declined to a very low level, compared with most other developing countries. The relative rarity of infant deaths in Malaysia limited the number of events available for analysis in the MFLS-2 data, especially for the Chinese and Indian subsamples. (For instance, there were only two Indian infant deaths for the three-year period from 1984 to 1986.) It is reasonable to expect that random, small sample variation is the cause of the apparent discrepancies. The fact that all MFLS-2 curves generally weave around their respective VS curves, sometimes rising above and sometimes falling below, is evidence for this explanation.

It is worth noting that the pattern of Chinese IMRs derived from MFLS-1 data (as reported by Haaga (1986a)) is similar to that seen here for MFLS-2 data. Compared with VS data, low IMRs are noted between 1968 and 1972 for both MFLS-1 and MFLS-2. Both MFLS curves rise above the VS curve again in 1973. This would suggest that the MFLS data may in fact be valid. These two surveys may be picking up a trend that is not reflected in the VS data.

**INFANT AGE AT DEATH**

The majority of infant deaths occur within the first several months of birth; one therefore expects a plot of the distribution would be concentrated to the left, with a long tail toward the right. This is indeed the pattern seen in the MFLS-2 data (Figure 10). There is, however, a slight rise in the distribution at 6 and 12 months. The heaping at 6 months does not affect IMR calculations. The heaping at 12 months, on the other hand, may or may not be a problem for users of the data. If the heaping is due to deaths being displaced downward (i.e., the infant really died after its first birthday), then the IMR could be biased upward. If the heaping is in the other direction, then the calculated IMR is not affected.
Figure 10—Distribution of Age at Death for Infants Who Died (MFLS-2 New Sample)

Users should be aware of the manner in which age at death is reported. A claim that a child died at 12 months may be interpreted differently from a claim that it died at one year of age. It was left to the respondent to specify the time unit in which age at death was reported. Eleven of the 262 infant deaths (4 percent) reported by MFLS-2 New Sample respondents gave "1 year" as the age at death. None gave "12 months" as the age at death. Thus, it may be that some of the MFLS-2 infant deaths at the 12-month point occurred after the infant’s first birthday.

FETAL MORTALITY

Compared with the MFLS-1, in general the MFLS-2 appears to have been more successful in eliciting information from women about fetal death (miscarriages and induced abortions) but less successful compared with the FPFA survey (Table 4).
Table 4 shows fetal mortality rates (defined here as the number of spontaneous and induced abortions per 1000 pregnancies) from the MFLS-2, the MFLS-1, and the FFPA surveys for pregnancies that occurred between 1970 and 1973 (the period covered by the FFPA survey). Note that the oldest MFLS-2 New Sample woman was only 33 in 1973; the oldest comparable cohort from all three surveys was the 30-34 year old cohort. FFPA rates for the total sample and for each of the three ethnic groups are missing from Table 4 because rates based on an age-restricted sample comparable to the MFLS-2 data were not available.

**Table 4**

Comparison of Fetal Mortality, 1970-1973, for MFLS-2, MFLS-1, and FFPA, by Age and Ethnic Group

<table>
<thead>
<tr>
<th>Group</th>
<th>MPLS-2</th>
<th>MFLS-1</th>
<th>FFPA [*]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-19</td>
<td>33 (122)</td>
<td>71 (84)</td>
<td>141</td>
</tr>
<tr>
<td>20-24</td>
<td>67 (283)</td>
<td>36 (279)</td>
<td>103</td>
</tr>
<tr>
<td>25-29</td>
<td>82 (207)</td>
<td>52 (307)</td>
<td>94</td>
</tr>
<tr>
<td>30-34</td>
<td>40 (75)</td>
<td>75 (240)</td>
<td>90</td>
</tr>
<tr>
<td>Malays [*]</td>
<td>59 (355)</td>
<td>36 (413)</td>
<td></td>
</tr>
<tr>
<td>Chinese [*]</td>
<td>67 (193)</td>
<td>67 (373)</td>
<td></td>
</tr>
<tr>
<td>Indians [*]</td>
<td>70 (143)</td>
<td>78 (116)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>63 (693)</td>
<td>55 (910)</td>
<td></td>
</tr>
</tbody>
</table>

[*] Number of pregnancies for FFPA rates not available; also, comparable rates for ethnic groups and total samples not available from FFPA.

[*] Rates for each ethnic group and total are calculated for women aged 15-34.

The MFLS-2 was at least as successful as the MFLS-1 in eliciting information from women about fetal deaths but less successful compared with the FFPA survey. The FFPA rates are considerably higher than either of the MFLS surveys (which are more similar to each other than to the FFPA). The large differences may be explained by several factors. First, the period of recall was greater for the MFLS surveys. The FFPA
was fielded in 1973, and respondents were asked to recall events for that year and the three preceding years. MFLS-1 respondents were interviewed in 1976 and the period of recall for events between 1970 and 1973 was between three and six years. MFLS-2 respondents were recalling events that occurred 15 to 18 years prior.

In addition, the FFPA was a very different type of survey, specifically designed to elicit information about fetal mortality. The line of questioning used included detailed probing about menstrual cycles and may have elicited information about miscarriages that occurred when the women may not have known she was pregnant. To quote from Haaga (1986a), "Women were first asked if they had any unusually delayed menstrual periods, then if they thought they might have been pregnant, whether they had done anything to bring about menstruation again."

In summary, the MFLS-2 probably underestimates fetal mortality rates for the period from 1970 to 1973. This is not surprising given the long period of recall required and the fact that short pregnancies that ended in miscarriage (particularly those occurring at an early age) are more likely to have been forgotten.

In Table 5, the percentages of women in the MFLS-2 New Sample who reported ever having had a fetal death (spontaneous or induced abortion) is compared with MPFS data. Since the MFLS-2 questionnaire, unlike the MFLS-1, distinguished between spontaneous and induced abortions, as did the MPFS, we were able to look separately at these measures to determine which type of information was more successfully collected. For Malays, both types of abortion rates from the MFLS-2 data are identical with those from MPFS data. Rates for Indians in MFLS-2 are slightly lower than those in MPFS. Both types of abortion rates for Chinese in MFLS-2, especially rates of induced abortion, are considerably lower than those in MPFS. However, the MFLS-2 data exhibit the same general pattern as the MPFS for induced abortions—namely, Chinese women are the most likely to report an induced abortion and Malay women exhibit virtually no reporting of induced abortions. With regard to spontaneous abortion, Indian women have the highest rates in both MFLS-2 and MPFS.
Table 5
Percentage of Ever Married Women Who Ever Experienced an Abortion, by Ethnic Group

<table>
<thead>
<tr>
<th></th>
<th>Spontaneous Abortion</th>
<th>Induced Abortion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td># MFLS-2 Women</td>
<td>MFLS-2 MPFS MFLS-2 MPFS</td>
</tr>
<tr>
<td>Malays</td>
<td>796</td>
<td>15 15 1</td>
</tr>
<tr>
<td>Chinese</td>
<td>405</td>
<td>12 16 7</td>
</tr>
<tr>
<td>Indians</td>
<td>290</td>
<td>20 22 5</td>
</tr>
<tr>
<td>Total*</td>
<td>1519</td>
<td>15 16 3</td>
</tr>
</tbody>
</table>

NOTE: MFLS-2 pregnancies are those occurring before 1985 in order to match MPFS sample dates.
*Includes 20 respondents for whom RACE = "Other."

A final measure of fetal mortality data quality is the age trend in the proportion of women reporting themselves to have ever experienced a fetal death. This proportion should rise with age. The MFLS-2 data does follow this pattern (see Figure 11); a greater proportion of women in each successively older age cohort had experienced at least one fetal death. Unfortunately, none of the available comparison sources provide a similar age cohort analysis.

![Graph showing percentage of women experiencing pregnancy wastage by age group.](image)

Figure 11—Percentage of Women Ever Experiencing Pregnancy Wastage by 1985, by Age Group (MFLS-2 New Sample)
Researchers who plan to use the MFLS-2 pregnancy loss data should also be aware that pregnancy loss rates increase the closer in time one gets to the time of interview. Examining pregnancy survival rates, Panis (1992) showed that the survival curve for pregnancies started in the 1980s was considerably below the survival curve for pregnancies that began in the 1970s. The curve for 1970s pregnancies in turn fell considerably below the curve for pregnancies that started prior to 1970. However, as Panis also shows, this apparent secular trend most likely reflects a change in the propensity to report rather than a change in biological incidence. He supports this contention by additional analysis that shows pregnancy survival rates are lower for more educated women. Over time, there has been a substantial improvement in educational attainment among Malaysian women (see Section 9); therefore according to Panis’ analysis, one would expect to observe such a secular reporting trend, and fetal mortality data are probably more complete for more recent time periods.
6. BIRTHWEIGHTS

IMPORTANCE AND POTENTIAL PROBLEMS

Low birthweight is an important risk factor for infant mortality and may affect growth and health outcomes later in life. Any tendency for survey respondents to misreport birthweights will bias estimates of the importance of this risk factor. One potential problem is that mothers are less likely to remember births of babies who died shortly after birth; these are often low birthweight, premature babies. Such recall problems would bias the birthweight distribution upward and dilute the estimated effects of birthweight on infant mortality and of socioeconomic correlates on birthweight (DaVanzo et al., 1984). DaVanzo et al. also suggest that there may be a "regression toward the mean" phenomenon in birthweight reporting. This would cause the observed distribution to be more heavily centered; the same estimation effects would result.

New Sample respondents were asked to provide the exact birthweight (i.e., give the weight in pounds and ounces) for each live-born child. In order to do this, the baby must have been weighed at birth and the mother must be able to remember the birthweight. If the exact birthweight was not known, the mother was asked to approximate the birthweight using the following categories: very low, less than average, average, above average, and heavy. The following tests were performed to assess birthweight data quality:

1. **Exact birthweight reporting**--the percentage of births for which an exact birthweight was reported was assessed by the baby’s decade of birth. One expects better recall of exact birthweights for more recent births than for more distant births.

2. **Distribution of birthweights**--the distribution from MFLS-2 was compared with the distribution from VS data. The curves should both be bell-shaped; the heights of the curves and their spread are also compared.
3. **IMRs for births without an exact weight reported**—in order to assess the quality of data collected when mothers could not recall an exact birthweight, IMRs were calculated for each of the five possible approximated weight categories. The IMR for "very small" babies should be highest, falling for "small" and "average" babies, rising slightly for "above average" and "heavy" babies. Similar IMRs were calculated for all MFLS-2 births by grouping exact weights into similar categories (Haaga, 1986a).

**EXACT BIRTHWEIGHT REPORTING**

An exact birthweight (in pounds and ounces) was reported for 91 percent of the births (5641/6178) reported by MFLS-2 New Sample respondents (see Table 6). (This compares to 70 percent for births reported in MFLS-1.) The proportion is higher for births that occurred closer to the time of interview, but even for births that occurred more than 30 years ago, exact birthweights were reported for nearly three-fourths of them. For births in the latter two decades, there were no substantial ethnic differences in exact weight reporting; the rates were nearly 90 percent or better for all groups. For earlier births, on the other hand, Malay mothers did not provide exact birthweights as often as Chinese and Indian mothers.

<table>
<thead>
<tr>
<th>Decade of Birth</th>
<th>Number of Births</th>
<th>% Births with Exact Birthweight Reported</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Malay</td>
</tr>
<tr>
<td>1950s</td>
<td>75</td>
<td>57</td>
</tr>
<tr>
<td>1960s</td>
<td>801</td>
<td>74</td>
</tr>
<tr>
<td>1970s</td>
<td>2216</td>
<td>90</td>
</tr>
<tr>
<td>1980s</td>
<td>3086</td>
<td>96</td>
</tr>
<tr>
<td>Total</td>
<td>6178</td>
<td>91</td>
</tr>
</tbody>
</table>

One additional observation is noteworthy. With 16 ounces to a pound and a random distribution of birthweights, one would expect to find approximately 6 percent of birthweights reported as a round number
of pounds (zero ounces). Among women reporting an "exact" birthweight, 12 percent reported it as a round number of pounds (zero ounces). It is not clear whether or not this represents a heaping phenomenon, and if so, how accurate these estimated "exact" weights are. This rounding in reports of "exact" birthweights was most common for earlier births (19 percent of 1950s births) and declined over time (7 percent of 1980s births).

**BIRTHWEIGHT DISTRIBUTION**

In Figure 12, the distribution of birthweights for live-born infants between 1982 and 1986, as reported by MFLS-2 respondents, is compared with Malaysian VS reports for 1984 (the midpoint of that interval). A five-year period was used for comparison with one-year VS data to increase the sample size. The MFLS-2 New Sample curve is composed of births for which an exact weight was given. Exact birthweights were reported for 88 percent of the MFLS-2 births (1583/1795) that occurred between 1982 and 1986, but for only 57 percent of all Peninsular Malaysian births (211,412/388,442) that occurred in 1984.

Both curves are approximately normally distributed. The peak of the VS curve is higher and its spread narrower than the MFLS-2 curve. If anything, the MFLS-2 birthweight data appear to be better than the VS data. The wider spread of the MFLS-2 curve suggests that low birthweight babies were not underreported by New Sample women. Similarly, there is no evidence of "regression toward the mean" in MFLS-2 birthweight reporting since the MFLS-2 distribution is as disperse, if not more so, than the VS data.

As noted above, only 57 percent of the births occurring in Peninsular Malaysia in 1984 were represented in VS birthweights reports. These reports are said to represent only births occurring in hospitals (personal communication, LPPKN, 1990). However, an analysis of missing VS birthweights shows that 48, 24, and 27 percent of births to Malay, Chinese, and Indian women, respectively, are missing from the 1984 VS records. In comparison, 43, 98, and 92 percent of births reported by Malay, Chinese, and Indian New Sample respondents, respectively,
occurred in hospitals. Chinese and Indian births, which usually occur in hospital settings, appear to be underrepresented in the VS data. Clearly, not all hospital births are reflected in the VS data. The quality of the VS data, then, is suspect; however, it is not possible to determine the extent or direction of bias, if any, this causes.

Figure 12—Distribution of Birthweights for Live Births in Malaysia, 1982-1986, All Ethnic Groups

For the 1982-1986 births to New Sample women, the distribution of birthweights for babies born in hospitals was compared with the distribution for those born in other places. These distributions (not shown) were very similar to the overall distribution shown in Figure 12, with the birthweight distribution for hospital births showing the expected higher proportion of low birthweight deliveries (although not much higher than for all births together). This provides further evidence to the contention that the differences between the MFLS-2 and the VS birthweight distribution curves are not due to differences in the place of birth for the two data sources. Since we do not know
specifically which births the VS data includes and which it excludes, the best comparison we can make is for all MFLS-2 births.

We also looked at estimated birthweights for MFLS-2 births for which an exact birthweight was not given by the mother. A higher proportion of these births were reported by their mothers to be smaller than average (24 percent) rather than above average (9 percent). This might be the expected distribution if the birthweights that would be the most difficult to recall tended to be for infants that died shortly after birth.

Just as Haaga (1986a) found with the MFLS-1 data, MFLS-2 data show that a higher proportion of newborns in the "very low" and "low" birthweight categories died during infancy (see Figure 13). (For this analysis, the sample included all births to New Sample women for which an exact weight was not given; it was not restricted to the 1982-1986 period.) This result is consistent with the observed negative relationship between birthweight and infant mortality--low birthweight infants have a much higher probability of dying in their first year of life (DeVanzo et al., 1984). Thus the estimated-birthweight data (i.e., when the mother could not recall an exact weight) do provide useful information.

![Figure 13—Infant Mortality Rates by Infant's Birthweight](image-url)
7. CONTRACEPTIVE USE

IMPORTANCE AND POTENTIAL PROBLEMS

Contraceptive behavior is an important variable in the investigation of fertility behavior. The main data quality concern is that women's reports on their contraceptive behavior may be biased toward what they think are the more socially desirable practices.\(^{10}\) In this case, knowing that MFLS-2 interviewers were employed by a federal agency (LPFKN) that promotes use of efficient (or modern) contraception methods may have encouraged some women to overreport use of contraceptives and to overreport use of efficient methods. Any such reporting bias could overstate the contribution of contraception to declining fertility trends.

For each pregnancy interval, MFLS-2 New Sample respondents were asked if they or their husbands had done anything to reduce the chance of becoming pregnant. They were asked several questions to determine which methods were used the longest in each birth interval, and when in each interval (how long after the birth or the end of the pregnancy) contraception began. These questions were asked for the period between the woman's first marriage and her first pregnancy outcome, and after each subsequent reported pregnancy outcome (live birth or otherwise).

We compared two aspects of contraceptive use as reported in the MFLS-2 with data from the MPFS:

1. Proportion of women who had ever used contraceptives--all pregnancy intervals prior to January 1985,\(^{11}\) for women who had ever been married by this date, were examined. Those who reported use of any method in any of these intervals were defined as "ever users." This proportion should rise as age increases. If

\(^{10}\)A discussion of such behavior and its effects on survey responses can be found in Sudman and Bradburn (1974).

\(^{11}\)January 1985 was roughly the midpoint in the MPFS interviewing process; therefore, this date was selected as the reference date for comparisons with MPFS data.
contraception has become more of a social norm, then MFLS-2 data might show a higher proportion of women reporting themselves to have been “current” users than was actually true.

2. Distribution of methods used among current users

a. In January 1985

The MFLS-2 data were used to determine the contraceptive method used, if any, in January 1985 by MFLS-2 women who were not pregnant at that time. (The method used longest in the pregnancy interval surrounding this date was assumed to be the method the woman would have reported had she been interviewed in January 1985.) This was compared with the distribution of methods used by “current” MPFS users at the time they were interviewed, which was late 1984 and early 1985. The reported prevalence of “efficient” method use might be higher among MFLS-2 respondents if they believed the interviewer would be more approving of these methods.

b. At the time of interview (1988)

The same analysis described above (2a) was done for women who reported that they were using contraceptives at the time of interview. This distribution was compared with the two 1985 distributions. Patterns should be similar, assuming that not much change has occurred between 1985 and 1988 in contraceptive method choice.

As described earlier, MPFS data were collected in late 1984 and early 1985. The MPFS interviewed a representative sample (4100 women) of ever married women between ages 15 and 49 living in private households in Peninsular Malaysia. Attempting to construct a subsample from the MFLS-2 data for comparison with these data sets introduces some problems into the analysis. First, such an MFLS-2 subsample is truncated; that is, the experience of older women in not reflected since the oldest MFLS-2 woman was only 45 in 1985. This bias toward younger
women in the MFLS-2 sample is in part compensated for by performing analyses on five-year age cohorts of women.

The second problem is that tabulations from the MPFS are based on questions about contemporary practices at the time of interview (January 1985); no such direct measure exists to determine the behavior of MFLS-2 respondents at that same precise date. We can determine only whether or not women had used a contraceptive at some point in the pregnancy interval surrounding that point in time; and, if they did, which methods were being used. Thus, the tabulations are not strictly comparable. Still, these comparisons should be adequate to provide some indication about the quality of MFLS-2 data.

PREVALENCE OF CONTRACEPTIVE USE

Table 7 compares the proportions of ever married MFLS-2 and MPFS women who had ever used contraceptives as of January 1985. The MFLS-2 data were truncated to include only those inter-pregnancy intervals that began prior to January 1985. Overall, the prevalence of ever having used contraception by January 1985 was very similar for the two surveys (74 percent for MFLS-2; 77 percent for MPFS). Across age groups, the patterns were similar for both surveys; the percentage of women who had ever used contraception increased as age increased, stabilized among women in their thirties, and declined among women in their forties.

Table 7

Percentage of Women Who Ever Used Contraceptives by 1985, by Age Group: Comparison of MFLS-2 New Sample and MPFS Data

<table>
<thead>
<tr>
<th>Age Group in 1985</th>
<th>% Ever Used for MFLS-2 Data</th>
<th>% Ever Used for MPFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-19</td>
<td>65 (58)</td>
<td>42</td>
</tr>
<tr>
<td>20-24</td>
<td>68 (260)</td>
<td>65</td>
</tr>
<tr>
<td>25-29</td>
<td>75 (401)</td>
<td>77</td>
</tr>
<tr>
<td>30-34</td>
<td>78 (395)</td>
<td>82</td>
</tr>
<tr>
<td>35-39</td>
<td>78 (243)</td>
<td>85</td>
</tr>
<tr>
<td>40-44</td>
<td>68 (145)</td>
<td>79</td>
</tr>
<tr>
<td>TOTAL</td>
<td>74 (1533)</td>
<td>77</td>
</tr>
</tbody>
</table>

NOTE: Sample sizes for MFLS-2 are in parentheses; none were reported for the MPFS data.
There were some differences within age groups. Among women who were between ages 15 and 19 in 1985, the percentage of MFLS-2 women who had ever used a contraception method (65 percent) was significantly higher than the proportion of MPFS women (42 percent); however, some of this difference may be due to the small MFLS-2 sample size (58 women). Differences between the surveys were small for women between age 20 and 34. Among older women (for age groups 35 to 39 and 40 to 44), MFLS-2 women were less likely to report having ever used contraceptives compared with MPFS women.

**METHODS OF CONTRACEPTION USED**

Table 8 compares the contraception methods used by MFLS-2 New Sample respondents who reported that they had ever used contraceptives and who were not pregnant in January 1985, with the methods used by users in the MPFS sample at the time of that survey. The two samples compare well. The MFLS-2 sample shows more use of efficient methods and less use of inefficient methods. The largest difference occurred in the reported incidence of pill use, with MFLS-2 women reporting considerably more use of this method than MPFS respondents. However, the proportion of respondents reporting use of most other methods were similar for the two surveys.

There are several possible explanations for the major differences seen in Table 8. First, selecting MFLS-2 women who were not pregnant in January 1985 selects women who were most likely to be using contraceptives successfully. These women are also more likely to be using efficient methods, causing the proportion of MFLS-2 efficient method users to be higher. Second, while MPFS respondents were reporting current use, MFLS-2 women were trying to retrospectively recall what they were doing three years previously. If there was recall error, it would most likely be in favor of efficient methods, since they were recalling that they successfully avoided pregnancy.

Differences in age structures of the two samples may also account for some of the discrepancy noted. The MFLS-2 sample does not include women aged 47 to 49 in 1985. Therefore, on average, it is a younger cohort compared with the MPFS sample. If younger women are more likely
to be users of efficient contraceptive methods, then we would expect the MFLS-2 results to be biased in favor of the efficient methods.

Table 8
Distribution of Contraceptive Methods Used by MFLS-2 and MPFS Women Who Were Using Contraception as of January 1985; and for Those in the MFLS-2 in 1988 (percentage of sample)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficient methods</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pill</td>
<td>64</td>
<td>58</td>
<td>64</td>
</tr>
<tr>
<td>IUD</td>
<td>35</td>
<td>23</td>
<td>30</td>
</tr>
<tr>
<td>Injection</td>
<td>5</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Condom</td>
<td>10</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>Sterilization</td>
<td>13</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>Inefficient methods</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abstinence</td>
<td>29</td>
<td>37</td>
<td>32</td>
</tr>
<tr>
<td>Rhythm</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>8</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Majun/Jamu</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Other herbs</td>
<td>2</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Other methods</td>
<td>6</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>100*</td>
<td>100*</td>
<td>100*</td>
</tr>
</tbody>
</table>

* Numbers do not add to 100 percent because of rounding.

The third column in Table 8 shows the distribution of methods used by MFLS-2 New Sample women who said that they were using contraceptives at the time of interview in 1988. This distribution is not subject to the problems encountered in constructing “current” use among MFLS-2 users in 1985; therefore, it should more accurately reflect their behavior. Assuming minimal changes in contraceptive method choice over the three years between 1985 and 1988, we would not expect to see great differences from the two 1985 columns. Indeed, the distributions are very similar, indicating that contraceptive method reporting, even for previous pregnancy intervals, is of high quality for more recent births.
The quality of contraceptive use data for intervals far back in time cannot be inferred from the analyses presented above.
8. BREASTFEEDING

IMPORTANCE AND POTENTIAL PROBLEMS

Breastfeeding is an important correlate of infant mortality and birth spacing. Unsupplemented breastfeeding provides infants with protective immunologic agents and reduces the risk of gastrointestinal infection. Breastfeeding also has a contraceptive effect by raising the circulating level of prolactin, thereby delaying the return to menses and preventing pregnancy.

There are two principal concerns about retrospective data on breastfeeding practices. First, as in the case of reporting about contraceptive behavior, there may be an interviewer effect on women’s responses to questions about breastfeeding. After extensive national campaigns to promote breastfeeding among Malaysian women, and given that the interviewers were identified as employees of an agency involved in such campaigns, women may have a propensity to report having breastfed their children when they in fact did not, or to report having breastfed their children longer than was actually the case. If such recall biases exist, the influence of breastfeeding on infant mortality or birth spacing would be underestimated.

Second, other researchers have found evidence of digit preference in reporting of breastfeeding durations (Haaga, 1986a). That is, there is a tendency for women to report these durations in multiples of six months. Depending on the extent to which digit preference is seen in the data, it may be difficult to use breastfeeding duration data as a covariate in some analyses.

We conducted the following tests to assess the quality of MFLS-2 breastfeeding data:

1. **Percentage of women who breastfed their youngest child** - the MPFS reported this percentage only for the last child born to respondents. The MFLS-2 sample was therefore restricted to reports about the child born closest in time before January 1985.
2. Distribution of durations of breastfeeding--this analysis was restricted to children born before January 1985. By 1988 (time of MFLS-2 interviewing), nearly all of these children would have been weaned, eliminating the need to adjust the distribution to account for those who may still have been breastfeeding.

PREVALENCE OF BREASTFEEDING

Table 9 shows a comparison of MFLS-2 and MPFS data on the percentage of women reporting to have breastfed their youngest child as of 1985. The two surveys compare well, although a slightly higher percentage of MFLS-2 women report having breastfed their youngest child. The difference was greatest in the oldest age group, the group with the longest average recall period. Part of the difference in the oldest age group may be due to differences in sample composition. The MFLS-2 sample is slightly younger, since the oldest MFLS-2 women were only 46 in 1985; whereas the MPFS sample contained women up to age 49.

Table 9
Percentage of Women Who Breastfed Their Youngest Child, as of 1985

<table>
<thead>
<tr>
<th></th>
<th>MFLS-2</th>
<th>MPFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethnic group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malay</td>
<td>97 (799)</td>
<td>95</td>
</tr>
<tr>
<td>Chinese</td>
<td>49 (392)</td>
<td>43</td>
</tr>
<tr>
<td>Indian</td>
<td>76 (287)</td>
<td>71</td>
</tr>
<tr>
<td>Age group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;25</td>
<td>80 (431)</td>
<td>81</td>
</tr>
<tr>
<td>25-34</td>
<td>79 (912)</td>
<td>77</td>
</tr>
<tr>
<td>35+</td>
<td>82 (156)</td>
<td>73</td>
</tr>
<tr>
<td>Total</td>
<td>80 (1499)</td>
<td>77</td>
</tr>
</tbody>
</table>

NOTE: Sample sizes for MFLS-2 are in parentheses; none were presented for the MPFS data.

Questions in the MFLS-2 on breastfeeding were also intended to allow for a more detailed analysis of the resurgence of breastfeeding among Malaysian women noted by Haaga (1986b) and corroborated by DaVanzo et al. (1993). DaVanzo and colleagues compared breastfeeding rates for MFLS-1 and the MFLS-2 New Sample for years covered by both surveys and
found higher rates of breastfeeding reported in MFLS-2 for the same time period. The MFLS-2 sample may, by chance, be one of women more likely to breastfeed than the population at large. It is also possible that as breastfeeding increased in popularity in Malaysia, women were more likely to report that they breastfed their babies, even when they did not.

Ethnic differences in the two data sets are very similar. Malay women are most likely to have breastfed their youngest child, while Chinese are least likely. According to the MPFS, older women are less likely to have breastfed their youngest child. The MFLS-2 shows breastfeeding among older women is as high as among younger women. However, it must be remembered that, unlike the MPFS, the 35+ age groups for this subsample of MFLS-2 women contain no women age 47-49, ages where non-breastfeeding might be quite high.

**Duration of Breastfeeding**

To determine whether MFLS-2 women exhibited digit preference in reporting breastfeeding durations, we looked at all children born at least four years before the survey. (The sample was restricted so that the infants assessed were likely to have been fully weaned.) Children who had died before three years of age were also removed from the sample since they may have stopped breastfeeding for reasons more related to the cause of their death than to a behavioral decision of the mother. Figure 14 shows clear evidence of digit preference for the MFLS-2 sample.

Haaga (1986a) suggests that in cases where such a pattern emerges, the presence of a culturally defined traditional weaning age should be examined as an explanation. We tested for this norm by looking at “current status” data for the cohort of children who were three years old or less at the time of the survey. We computed, for each successive age in months, the proportion of children who were still breastfeeding at the time of the survey. If traditional weaning ages in fact exist, we would expect to see a sharp drop in the proportion of these children still breastfeeding at the spikes seen in Figure 14. Figure 15 shows the trend in proportion still breastfeeding to be rather smooth,
indicating that the digit preference pattern is not explainable by a traditional weaning age. (Haaga found no evidence in the literature suggesting the presence of traditional weaning ages in Peninsular Malaysia.)

![Graph showing frequency distribution of breastfeeding duration](image)

**Figure 14—Frequency Distribution of Reported Breastfeeding Duration for Women's Last Two Live Births (1985 or earlier)**

Aggregating births of all ethnic groups may obscure the presence of a traditional weaning age if such an age differs by ethnic group. This analysis was therefore replicated for Malays, Chinese, and Indians to uncover such points if they exist. The number of Chinese and Indian births in each month is too small (generally between 0 and 4) to obtain a reliable estimate of the proportion still breastfeeding. For Malays, as was the case for the aggregated sample, the curve exhibits a gradual (though somewhat erratic) decline from near universal initiation of breastfeeding rather than a two-tiered structure that would be expected if there were an observable traditional weaning age.
Figure 15—Percentage of Infants Still Breastfeeding at the Time of the MPLS-2 Interview, All Births vs. Malay Births
9. EDUCATION

IMPORTANCE AND POTENTIAL PROBLEMS

Educational attainment is known to affect a wide range of household and individual decisions and preferences, including marriage and contraception (which affect fertility), and child bearing and child rearing practices (which affect infant and child survival). Some of the greatest intergroup differences in breastfeeding practices, for instance, are seen among women of different educational levels (DaVanzo et al., 1993). Misreporting would probably occur in the direction of overestimating the number of years of education a woman has had. Women who have had little formal schooling might be more predisposed to overstate their status if having less education is embarrassing. Overstating the number of years of schooling would bias estimation of the effects of education on the age at first marriage, for instance, downward.

Because the MFLS-2 was fielded in one round, rather than several, as was the case for MFLS-1, questions about educational achievement were asked only once. Retest reliability within the data set, therefore, could not be assessed. Instead, MFLS-2 data were compared with Malaysian population census data to assess the quality of information given about education. We did this by comparing the proportion of New Sample women, by age group, who had ever attended school, by age group in 1970 and 1980, with respective proportions reported in census reports.

EDUCATIONAL ATTAINMENT

Table 10 shows the percentage of MFLS-2 New Sample women, by their age group in 1970 and 1980, who reported that they had ever attended school, compared with similar data from census data. The MFLS-2 data compare very well with the census data. The noted exception is among the cohort of women who were the 20 to 29 year olds in 1970 (i.e., age 30-39 in 1980). The MFLS-2 women in that cohort report a 4 percentage point higher “ever attended” rate than suggested by the 1970 census data
and 6 points higher than the 1980 census data. Although this is not a large difference, it may indicate that some overstatement of educational attainment exists among the oldest group of MFLS-2 women.

### Table 10
Percentage of Peninsular Malaysian Women Who Had Ever Attended School, 1970 and 1980

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>10-14</td>
<td>93</td>
<td>92</td>
<td>97</td>
<td>97</td>
</tr>
<tr>
<td>15-19</td>
<td>91</td>
<td>88</td>
<td>96</td>
<td>95</td>
</tr>
<tr>
<td>20-29</td>
<td>80</td>
<td>76</td>
<td>92</td>
<td>90</td>
</tr>
<tr>
<td>30-39</td>
<td>*</td>
<td>48</td>
<td>80</td>
<td>74</td>
</tr>
</tbody>
</table>

* Few women in the MFLS-2 New Sample were age 30-39 in 1970 since the oldest woman in 1980 was age 49 and she would only be 31 in 1970.

To better examine this question, we compared education levels from the 1980 census and the 1988 MFLS-2 New Sample reports for the same cohort of women. Table 11 shows high agreement in the distribution of educational attainment for the cohorts of women aged 15-19 and 20-29 in 1980. However, for the oldest cohort, age 30-39 in 1988 (i.e., 38-47 in 1988), the MFLS-2 distribution of reports shows fewer women reporting no schooling and more reporting secondary education compared with the census data. Only 20 percent of that oldest cohort report no schooling compared with the 26 percent in the 1980 census data. Given that these women were aged 30-39 in 1980, it seems unlikely that they would have acquired additional schooling since 1980. The percentage reporting primary school education is consistent with the census data. The percentage reporting secondary education is higher in the MFLS-2 data—24 percent versus the 20 percent found in 1980 census data. Again, though the differences are not large, they do suggest some "educational inflation" among the oldest group of women in the MFLS-2 New Sample.
Table 11
Comparison of Educational Attainment Distribution Between 1980 Census and MPLS-2 for the Same Cohorts of Women (percentage of sample)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>4</td>
<td>5</td>
<td>8</td>
<td>10</td>
<td>20</td>
<td>26</td>
</tr>
<tr>
<td>Primary</td>
<td>27</td>
<td>24</td>
<td>45</td>
<td>44</td>
<td>56</td>
<td>54</td>
</tr>
<tr>
<td>Secondary</td>
<td>69</td>
<td>71</td>
<td>47</td>
<td>46</td>
<td>24</td>
<td>20</td>
</tr>
</tbody>
</table>

Figure 16 shows educational attainment of Peninsular Malaysian women at the time the MPLS-2 survey was fielded. The figure shows that the trend toward more education, as seen in Table 10, has continued. Younger women are less likely to have never been to school than older women, and among women who have attended school, a higher proportion of the younger women have had at least some secondary education.

Figure 16–Educational Attainment of Malaysian Women in 1988 (MPLS-2 New Sample)
There are some important ethnic differences in educational attainment (see Table 12). For instance, among older women, Malays were the least educated. Educational status of Malay women has improved the most; among the youngest women, Malays have the highest level of educational attainment. While educational status of Indian women has also improved for younger women compared with their older counterparts, they have lagged behind both Malay and Chinese women. Among 15 to 19 year olds, the percentage of Indian women having attended secondary school is considerably lower (67 percent) than Malay (94 percent) and Chinese (92 percent) women.

Table 12

Educational Attainment of Malaysian Women in 1988, by Age Group and Ethnic Group Based on the MFLS-2 New Sample (percentage of age/ethnic group subsample)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Malay</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>8</td>
<td>10</td>
<td>20</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chinese</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>9</td>
<td>19</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Indian</td>
<td>4</td>
<td>9</td>
<td>13</td>
<td>9</td>
<td>10</td>
<td>23</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All groups</td>
<td>1</td>
<td>4</td>
<td>6</td>
<td>7</td>
<td>10</td>
<td>20</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>Malay</td>
<td>6</td>
<td>19</td>
<td>22</td>
<td>41</td>
<td>59</td>
<td>58</td>
<td>56</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chinese</td>
<td>8</td>
<td>18</td>
<td>39</td>
<td>57</td>
<td>51</td>
<td>46</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Indian</td>
<td>30</td>
<td>24</td>
<td>38</td>
<td>48</td>
<td>51</td>
<td>64</td>
<td>62</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All groups</td>
<td>11</td>
<td>19</td>
<td>28</td>
<td>46</td>
<td>55</td>
<td>54</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>Secondary</td>
<td>Malay</td>
<td>94</td>
<td>78</td>
<td>74</td>
<td>51</td>
<td>31</td>
<td>21</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chinese</td>
<td>92</td>
<td>82</td>
<td>57</td>
<td>39</td>
<td>40</td>
<td>36</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Indian</td>
<td>67</td>
<td>67</td>
<td>48</td>
<td>42</td>
<td>39</td>
<td>12</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All groups</td>
<td>88</td>
<td>77</td>
<td>66</td>
<td>47</td>
<td>35</td>
<td>26</td>
<td>18</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Percentages within a given age/ethnic group combination may not sum to 100 because of rounding.
10. CONCLUSIONS

The quality of the Female Life History data from the New Sample of the MFLS-2 was assessed in this report. In general, the retrospective data proved to be of good quality in representing trends and patterns in marriage, fertility, infant and fetal mortality, birthweights, contraception, breastfeeding, and education. Malaysian VS reports, census reports, and the 1984-1985 MPFS were the main sources used for comparisons with MFLS-2 data. Below we review our main findings.

MARRIAGE

Analysis of marriage data shows that women from the MFLS-2 New Sample are more likely to have ever been married than women from the comparison sources. This difference was most pronounced among younger women and in comparisons closer to the time that the MFLS-2 was fielded. Sampling only private households for MFLS-2 (that is, not including institutional housing in the sample frame) probably accounts for the differences between MFLS-2 and Peninsular Malaysian census data. However, the MPFS also sampled only private households; the difference between MFLS-2 and MPFS marriage rates in 1985, therefore, remains to be accounted for. It could be that the rapid pace of industrialization has created enough new opportunities for young women to have resulted in significantly more migration away from private households, even in the short period between MPFS and MFLS-2 sample selections. This would cause the MFLS-2 sample to have underrepresented single women relative to the MPFS.

MFLS-2 data compared very well with census data for marital status in 1970, indicating that New Sample women did not systematically bias their marital history reports, even for more distant events. Examination of MFLS-2 data shows that the trend toward later marriage continued through 1988. This trend appears to be true for each of the three major ethnic groups in Peninsular Malaysia.
FERTILITY

Overall, our analysis of pregnancy data supports the conclusion that MFLS-2 women accurately reported the number and timing of births. The reported mean number of children born per MFLS-2 woman was remarkably similar to that reported in both census reports and the MPPS. Information about children’s date of birth was generally as good or better compared with similar surveys conducted in Asian countries. Even when birth dates were not completely reported, there was enough information provided to allow imputation of at least the year of birth.

The sex ratio of births in MFLS-2 data was reasonably close to ratios calculated from VS reports, with the exception of Chinese births in the 1970s. However, the direction of the problem related to Chinese births was opposite from expectations; more female births, relative to male births, were reported. This difference for Chinese infants does not appear to be due to the nonreporting of male infants who died shortly after birth or to misreporting live births as still births. Examination of sex composition of infants who died and stillborn rates between MFLS-2 and VS reports showed good comparability.

Patterns in fertility rates in MFLS-2 data are consistent with expectations. Rates increased through the 25-29 year old age group and declined thereafter. However, MFLS-2 fertility rates were consistently higher than rates calculated from VS reports. In light of the apparent accuracy in reports of number and timing of births, the possibility that the MFLS-2 New Sample contains an overrepresentation of married women must be considered. This possibility is supported by analysis of MFLS-2 marriage data, which show a consistent pattern of higher proportions of MFLS-2 women reporting themselves as married, compared with external source data. Indeed, when age-specific marital fertility rates are compared between the MFLS-2 and VS, the similarity is quite high. Thus, when using the MFLS-2 for fertility rate computations, one might do better by focusing on marital fertility rates.

INFANT AND FETAL MORTALITY

On the whole, it appears that MFLS-2 women also accurately reported incidents of infant deaths. Accuracy was best among Malay women, as
measured by the fit between VS and MFLS-2 infant mortality curves. Infant mortality rates for Chinese and Indian women were less stable. Given that MFLS-2 IMRs fluctuated around the VS curves, we suspect that instability is due to small sample size variation (i.e., few infant deaths), rather than a problem with omissions in reporting. The distribution of reported age at death for infants follows the expected pattern, indicating that this information is also good.

The MFLS-2 was somewhat more successful in eliciting information from Malay women about fetal deaths compared with the MFLS-1. Reporting among Chinese and Indian women was about the same. Although comparison of MFLS-2 data with the MPFS suggests that the quality of data collected is on a par with that collected by similar retrospective survey instruments, evidence from the FPPA, which was specifically designed to obtain fetal mortality information, strongly suggests that MFLS data (like the MPFS and similar surveys) on this subject significantly underestimate the prevalence of fetal deaths. Thus, for detailed fetal mortality studies, the MFLS-2 data should be used with caution.

**BIRTHWEIGHT**

The distribution of reported birthweights by MFLS-2 women is very close to the distribution reported in VS reports. The birthweight distribution for MFLS-2 births is slightly lower than that of VS births (i.e., shifted to the left). Differences between the two curves are probably due to the fact that VS data represent only 57 percent of births occurring in Peninsular Malaysia, and these births may be less representative of Peninsular Malaysian births than the MFLS-2 sample.

Exact birthweights were reported for over 90 percent of the infants born to MFLS-2 New Sample women. Our data suggest that women are less likely to know the exact birthweight of low birthweight infants, especially if the child died in infancy. Also, as Haaga (1966a) concluded for MFLS-1 data, proper survey instruments and administration seem to be successful in eliciting approximate birthweights from women who do not know the exact birthweight of their children.
CONTRACEPTION

Data on contraceptive use compare remarkably well with data from the 1984-1985 MPFS, especially given the difficulties of comparing retrospective reporting of behaviors (MFLS-2) with contemporary data (MPFS). Patterns seen across age groups in prevalence of ever having used contraceptives were very similar, as were the levels of use within each age group. The largest discrepancy occurred among women aged 15 to 19; much of this difference may be attributable to the small number of MFLS-2 women in this age group who were married by January 1985 (58 women). Reports by MFLS-2 women on methods used appear to be quite accurate. Despite difficulties in comparing current (MPFS) and non-current (MFLS-2) reports of methods used in 1985, the reported distributions of methods used are very similar. Moreover, when one looks at “current” methods used among MFLS-2 New Sample women who were using contraceptives at the time of interview, the distribution is even more similar to the MPFS data. One would expect little change in patterns of contraceptive choices over the three-year period between the two surveys; indeed this is reflected in the data.

BREASTFEEDING

Quality of MFLS-2 breastfeeding data varies. On the question of ever having breastfed their children, MFLS-2 data compared well with reports by MPFS women, though our rates were slightly higher across all ethnic and age groups. (This may be due in part to the increasing popularity of breastfeeding in Malaysia.) On the question of duration of breastfeeding, the MFLS-2 suffered the same problem with digit preference as did the MFLS-1; many women report the duration in multiples of six months. An internal check on breastfeeding duration reported in MFLS-2 using a cohort of births occurring within 3 years of fielding the survey indicates that this digit preference is not due to the presence of a traditional weaning age in Malaysia. Heaping of durations is a common problem in retrospective data; however, variation does exist in MFLS-2 women’s reports on breastfeeding durations since everyone did not heap. Even in those cases where heaping occurred, actual durations probably were close to the reported duration. Thus the
data are still useful to researchers. Using categories of breastfeeding duration ("short," "average," and "long," for instance) may be more advisable than using actual number of months reported.

EDUCATION

We found only a slight upward bias in reported educational attainment when we compared educational attainment between MFLS-2 New Sample cohorts and their counterparts in the 1980 census. The educational attainment distribution for the cohorts of women aged 15-19 and 20-29 in 1980 (i.e., ages 23-27 and 28-37 in 1988) were basically the same between the census and MFLS-2 reports. Only the age 30-39 cohort (age in 1980) showed some upward bias in the MFLS-2 reports by exhibiting a lower proportion of women with no schooling and a higher proportion of women with some secondary schooling than suggested by the 1980 census for that cohort.

Trends in education among MFLS-2 New Sample women are as expected; fewer younger women report never having attended school compared with older respondents. Among those who have attended school, younger women report attaining higher levels of education. The relative educational status of the three major ethnic groups has changed over time. Whereas among older women, Malays were the least educated, among younger women, they are the most educated. This is consistent with known governmental educational policies, which promoted educational development, particularly in rural areas where the Malay population predominates. Education data appear to be of very high quality.
REFERENCES


Haaga, John G. (1986a) The Accuracy of Retrospective Data from the Malaysian Family Life Survey, RAND, N-2157-AID.


