

THE MALAYSIAN FAMILY LIFE SURVEY: SUMMARY REPORT

PREPARED FOR THE AGENCY FOR INTERNATIONAL DEVELOPMENT

WILLIAM P. BUTZ, JULIE DAVANZO

**R-2351-AID
MARCH 1978**

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PREFACE

This report is one of a series of publications growing out of a survey and research project to investigate the influence of certain economic and institutional factors on couples' fertility behavior in Peninsular Malaysia. The project was funded by the U.S. Agency for International Development and was conducted by The Rand Corporation in collaboration with, initially, the Department of Statistics of the Government of Malaysia, and subsequently, Survey Research Malaysia, Sdn. Bhd. The purpose of the project was to identify factors within the range of direct public policy influence that affect birthspacing and family size, and to estimate the magnitude of statistical relations between these factors and fertility outcomes.

The data-gathering phase of the study, which is now complete, has involved the development and field testing of survey instruments; the training of field personnel; the collection, coding and cleaning of data; and the preliminary statistical investigation of research hypotheses. Project output includes the resulting data set, reports on initial research findings, and materials of methodological and operational interest to investigators who use the data set or are involved in similar projects. The Rand reports on this phase of the study include the following:

- o William P. Butz and Julie DaVanzo, *Economic and Demographic Family Behavior in Malaysia: A Conceptual Framework for Analysis*, R-1834-AID, October 1975.
- o William P. Butz and Julie DaVanzo, *The Malaysian Family Life Survey: Summary Report*, R-2351-AID, March 1978.
- o William P. Butz, Julie DaVanzo, Dorothy Z. Fernandez, Robert Jones, and Nyle Spoelstra, *The Malaysian Family Life Survey: Appendix A, Questionnaires and Interviewer Instructions*, R-2351/1-AID, March 1978.
- o Terry Fain and Tan Poh Kheong, *The Malaysian Family Life Survey: Appendix B, Round One Codebook*, R-2351/2-AID, March 1978.

- o Robert Jones and Nyle Spoelstra, *The Malaysian Family Life Survey: Appendix C, Field and Technical Report*, R-2351/3-AID, March 1978.
- o Fahmi Omar, *The Malaysian Family Life Survey: Appendix D, Descriptions of Sample Communities*, R-2351/4-AID, March 1978.
- o William P. Butz and Julie DaVanzo, *Contracepting, Breast-feeding, and Birthspacing in Peninsular Malaysia: A Model of Decisionmaking Subject to Economic and Biological Constraints*, R-2352-AID, forthcoming.
- o Iva MacLennan, *RETRO: A Computer Program for Processing Life History Data*, R-2363-AID/RF, March 1978.
- o Julie DaVanzo and Donald L. P. Lee, *The Compatibility of Child Care with Labor Force Participation and Nonmarket Activities: Preliminary Evidence from Malaysian Time Budget Data*, P-6126, forthcoming.

The Codebook for Rounds Two and Three is expected to be available in late 1979 as Appendix E to R-2351-AID.

The present report contains a brief summary of the surveying and data preparation and of the initial research findings. It takes summary information from several of the above reports to acquaint the reader with the purposes and dimensions of the project. Details concerning all aspects can be found in the other documents.

ACKNOWLEDGMENTS

This project has been the joint effort of a number of people at Rand and in Malaysia. Some are authors of publications cited in the Preface; others are acknowledged within those publications, especially in R-2351/1-AID, which presents the questionnaires and interviewer instructions.

We thank our collaborators, Dorothy Z. Fernandez of the Department of Statistics, Government of Malaysia, and Robert Jones and Nyle Spoelstra of Survey Research Malaysia. Dorothy and her staff, and later Rob and Nyle and theirs, worked long months on the details of preparing and conducting this complex survey. If the resulting data are of unusually high quality, it is because of their efforts; if not, it is because of our inexperience and unwillingness to agree to all their suggestions.

Throughout this project, our successive AID monitors--Carl Hemmer, Duncan Miller, Thomas Hoopengardner, and David Holmes--have been generous with their technical expertise and skillful in handling the required administrative and bureaucratic procedures. We are also indebted to Robert Muscat, then of AID, for first suggesting to us that Malaysia would be a good setting for this research and for personally introducing us to Malaysian officials who were subsequently helpful, especially Ramesh Chander, then Chief of the Malaysian Department of Statistics. James A. Brown, Jr., of AID, has continually brought to our attention related surveys and research, and has advised and encouraged us during difficult periods in the project's development. Without his efforts this project would not have begun or, having begun, would not have been completed. We are also indebted to T. Paul Schultz of Yale University for stimulating our interest in the issues that led to this project and for early discussions and suggestions that strongly influenced the general format of the survey.

We accept responsibility, of course, for any shortcomings in the data or the initial research findings.

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I. PURPOSE OF THE SURVEY

The questionnaires used in this project were designed to provide data for estimating the magnitude of key economic and biomedical relationships affecting birthspacing, family size, and breastfeeding patterns of families in Peninsular Malaysia. The goal was to identify factors amenable to public policy influence that directly or indirectly affect fertility outcomes.

Testing our research hypotheses* required data on the following subjects:

- o *Demographic dependent variables*
 - Pregnancy intervals and outcomes
 - Lengths of lactation
 - Contraceptive use
- o *Primary demographic and biological conditioning factors*
 - Marital status
 - Spouse separation
 - Child deaths
 - Lengths of postpartum amenorrhea
- o *Major determinants of opportunity cost of a woman's time with children*
 - The woman's time use in particular activities
 - Compatibility of these activities with child care
 - Availability of child-care substitutes
- o *Major components of the family's economic resources*
 - Family income
 - Family wealth
 - Economic value of children to parents
 - Availability of substitutes for economic value of children

* See William P. Butz and Julie DaVanzo, *Economic and Demographic Family Behavior in Malaysia: A Conceptual Framework for Analysis*, The Rand Corporation, R-1834-AID, October 1975, for a discussion of these hypotheses.

o *Community factors of primary interest*

Availability of agricultural inputs and products

Characteristics of the private and public supplies
of contraceptives, weaning foods, schooling, water
sanitation, and medical services

II. SURVEY INSTRUMENTS*

Nearly all the individual questions in the survey instruments were designed to elicit data on one or more of the conceptual variables listed in Sec. I. The other survey questions fill data needs that cannot be so briefly summarized. The number of questions and the amount of surveying in this study may seem large in relation to the number of hypotheses and conceptual variables. However, some conceptual variables such as family income, family wealth, the economic value of children to parents, and the opportunity cost of women's time with children have many components that must be separately documented. Other conceptual variables such as women's and children's time use are subject to considerable seasonal variation as well as substantial recall error when the reference period is long.

These and other general considerations, along with a variety of factors specific to the Malaysian setting, led to a longitudinal survey design consisting of three rounds, four months apart. Questions were clustered into questionnaires more according to the desired respondent and reference period for each question than to the conceptual similarity of groups of questions. For example, information necessary to construct empirical proxies for the economic value of children is drawn from questionnaires MF1, MF4, MF5, MF6, MF7, and MF8, while family income is derived from information in questionnaires MF2, MF3, MF4, MF5, and MF6. Within questionnaires, questions are, of course, sequenced according to standard interviewing considerations.

The questionnaires were field-tested in different socioeconomic settings. The first field versions of the instruments were developed by members of the professional staff of the Census and Demography

*The survey instruments and interviewer instructions are presented in William P. Butz et al., *The Malaysian Family Life Survey: Appendix A, Questionnaires and Interviewer Instructions*, The Rand Corporation, R-2351/1-AID, March 1978.

Division, Department of Statistics, the Government of Malaysia, in collaboration with the Rand project leaders. Each questionnaire was first tested in a controlled environment in the office of the Department of Statistics in Kuala Lumpur and then in both urban and rural private households around Kuala Lumpur.

Subsequent tests took place in rural Malay fishing villages in Trengganu (on the east coast of Peninsular Malaysia), in a west coast padi area, among urban Chinese and Indian families, and among several rural Chinese families. Tests were conducted in Malay, English, Mandarin, Cantonese, and Tamil. Interview-reinterview checks on reliability and husband-wife comparisons of validity were made at this stage. This sequence of testing facilitated questionnaire development in controlled, then semicontrolled, environments, while developing the instruments in the necessary languages and in forms that did not constitute interviews of excessive length.

Subsequently, extensive modifications were made by Survey Research Malaysia during the training and final field-testing phases. The need for these modifications came to light during class practice and trial interviews, and it was decided to adopt a system of question books and recording forms. All instructions to interviewers were printed in order in the question book, from which the interviewers read all questions verbatim. This ensured standardization in the wording and order of questions. All survey instruments, except the Community Questionnaire (MF11), were formatted for keypunching directly from the questionnaire.

Below, we briefly describe the purpose of each questionnaire, indicating to whom and how often it was administered. This information is summarized in Table 1.

MF1: HOUSEHOLD ROSTER

Questionnaire MF1 was administered to the selected ever-married woman (EMW)^{*} or other adult female household member who had lived

^{*}See p. 13 for information on the respondent selection procedure.

Table 1

SUMMARY OF SURVEY SCHEDULE

Questionnaire	Eligible Respondents ^a	Round(s) in Which Administered	Average Interview Length in Round 1
MF1: Household Roster	Selected ever-married women (EMW) less than 50 yr old, or other eligible adult female	Administered completely in 1; updated in 2 and 3	20 minutes
MF2: Female Retrospective	EMW	Administered completely in 1; updated in 2 and 3	60 minutes ^b
MF3: Male Retrospective	Present husbands of EMW	Administered completely in 1; updated in 2 and 3	40 minutes ^b
MF4 and MF5: Female and Male Time Budgets	EMW and their present husbands	Administered completely in 1, 2, and 3	25 minutes - MF4 13 minutes - MF5
MF6: Income and Wealth	Male heads of household or other members of household that contains an EMW less than 50 yr old	Administered completely in 1, 2, and 3	43 minutes
MF7 and MF8: Female and Male Attitudes and Expectations	EMW and their present husbands	Administered in 2 only	
MF9: Networks of Economic Support	EMW	Administered in 3 only	
MF10: Migration and Urban Assimilation	Present husbands of EMW	Administered in 3 only	
MF11: Community Information	Village chiefs, midwives, and other knowledgeable persons (several questionnaires per Primary Sampling Unit)	Administered throughout the survey	

^aThe respondent selection procedure is described on page 13.

^bRound 2 and 3 updates take considerably less time.

with the household for at least one year. The questionnaire was administered during the first survey round and repeated during subsequent rounds.

The following information is collected in MF1: composition of household; relationships among household members; number of months each member resided in the household in the last twelve months; ethnic community; sex, birthdate, age, and marital status of each household member; literacy (reading and writing ability); current attendance in school; highest level of schooling completed by each member; highest school certificate obtained; and basic characteristics of the last school attended by each member.

MF2: FEMALE RETROSPECTIVE

This questionnaire was administered to all selected ever-married women less than 50 years old. It was given during the first survey round and updated during subsequent rounds.

Questionnaire MF2 elicits a life history of pregnancies, lactations, first postpartum menstruations, contraceptive use, marital status changes, migration, house characteristics and household composition, help with children, and education and training of each respondent, as well as a work history that includes occupation, amount of time worked for each job held, and earnings at intervals of not more than three years. The information in MF2 is documented from age 15, age of first marriage, or age of first pregnancy, whichever is earliest.

The interview procedures for MF2 (and MF3) emphasize cross-referencing dates and respondent ages across events in different life areas. This technique helps determine the dates of particular events and facilitates checking the consistency of the life history over time and across life areas. Such cross-checking during the interview is greatly aided by the accurate birth registration records kept by virtually all mothers as part of the Malaysian vital statistics and citizen identification systems.

MF3: MALE RETROSPECTIVE

This questionnaire was administered to all present husbands of selected women less than 50 years old.* Like MF2, it was administered during the first survey round and updated during subsequent rounds.

The Male Retrospective questionnaire elicits a life history from age 15 or first marriage (whichever is earlier) to the present, and covers schooling and training; marital status changes; occupations; earnings; amount of time worked; property owned; and gifts, inheritances, and dowries received.

MF4 AND MF5: TIME BUDGETS

MF4 and MF5 were administered to female respondents and their present husbands in each survey round, thus providing information about seasonal variation in time allocation. The questionnaires document (1) number of hours spent at an activity in the last seven days the activity was performed; (2) number of weeks the activity was performed in the last four months; (3) rate of pay (if any) in cash and/or kind for the activity; (4) distance from home to place of activity; (5) amount of help received; and (6) presence of children less than 11 years old while the activity was being performed. Time use of eligible male and female respondents, of their children living with them, and of other helpers (paid or unpaid) is documented. All market and nonmarket activities of interest are covered, including all jobs, unpaid family work, schooling, training, cottage industry, housework, and child care (but excluding recreational activities and sleep).

MF6: INCOME AND WEALTH

Data on income and wealth were collected for each sample household in MF6. The primary respondent was the male head of household; if he was not present or was unable to give complete information on all the categories covered in this questionnaire, other household

* If the EMW has no husband or he is not available for interview, the property and gifts section is still administered, with the EMW as respondent.

members were interviewed. MF6 was administered during each survey round. The reference period was 12 months in the first round and 4 months in later rounds.

This questionnaire gathers information on all income (except that covered in MF4 and MF5) received by the household in the reference period, quantities of property and durable goods owned, and changes in these components of wealth in the reference period. Data were collected on agricultural production; ownership of animals; businesses owned; services performed; gifts from non-household members; inheritances or dowries received; income from insurance, pensions, retirement programs, or interest; income received from renting out rooms, houses, or land; ownership of land; and possession of durable goods. In addition, MF6 collected information on money borrowed or interest paid in the reference period and on whether the respondent or his spouse were covered by the government retirement program (Employees' Provident Fund (EPF)), had any kind of insurance, and/or had money in a bank or savings account in the reference period.

MF7 and MF8: ATTITUDES AND EXPECTATIONS

These questionnaires were administered only during the second survey round to all ever-married women less than 50 years old and to their present husbands.

The Attitudes and Expectations questionnaires elicit information about ages at which sons and daughters became helpful in various activities; expected occupations and educational attainment of children; help in cash, goods, and services that respondents have given to their parents and help they receive or expect to receive from their own children; other types of expected old-age support; desired family size; number of respondents' siblings; education and occupation of respondents' parents; and opinions regarding fertility-related areas.

MF9: NETWORKS OF SUPPORT^{*}

This questionnaire was added to the project in the third round of the survey to document the flow of goods, help, and money (including loans) between respondents in this sample and their relatives, friends, and acquaintances. The questionnaire documents the types, amounts, and directions of transfers during the previous 12 months and the obligations incurred because of the transfers. The questionnaire was administered to the EMW.

MF10: MIGRATION^{**}

This questionnaire determines the extent of geographic mobility and ascertains the causes and consequences of families' migration. The questionnaire covers all the moves made by the family, and then focuses on the most recent time the respondent made a complete change of home and workplace, examining the distance moved, accompaniment of family, reasons for moving, where lived on arrival, economic support received and employment status after moving, prior knowledge of destination, and return moves back to origin. The questionnaire was administered to the husband in the third round of interviewing.

MF11: COMMUNITY QUESTIONNAIRE

For each primary sampling unit in the sample, information was collected on schools, family planning clinics, job markets, and prices of relevant commodities. This questionnaire also elicits historical information about epidemics, floods or droughts, job training programs and public utilities, family planning programs, and schools. It was administered to a variable number of spokesmen in each community and where necessary was supplemented from external information sources. The data were collected throughout the survey period.

* All phases of work on Questionnaire MF9 were supported by a separate contract with the U.S. Agency for International Development.

** All phases of work on Questionnaire MF10 were supported by a separate contract with the U.S. Agency for International Development.

III. SAMPLE DESIGN^{*}

The sample for the study consisted of 1262 private households, each containing at least one ever-married woman (i.e., one who had been married at least once, regardless of her present marital status) less than 50 years of age at the time of the initial visit. These households were located in 52 geographic areas of Peninsular Malaysia (see Fig. 1). Forty-nine areas^{**} were selected by area probability sampling methods, and three were purposively chosen to give Indian families and families living in fishing communities additional representation.

The geographic areas, called Primary Sampling Units (PSUs), were selected from a sampling frame covering the whole land area of Peninsular Malaysia.[†] A PSU contains approximately 220 Dwelling Units (DUs); a DU is defined as an enclosed private living area which has a separate entrance from a public area.

All Dwelling Units in each selected PSU were recorded on specially drawn maps and their addresses listed. The DUs were numbered in a systematic sequence and 2088 were selected randomly. Excluding (1) DUs that were vacant, locked up or demolished; (2) those

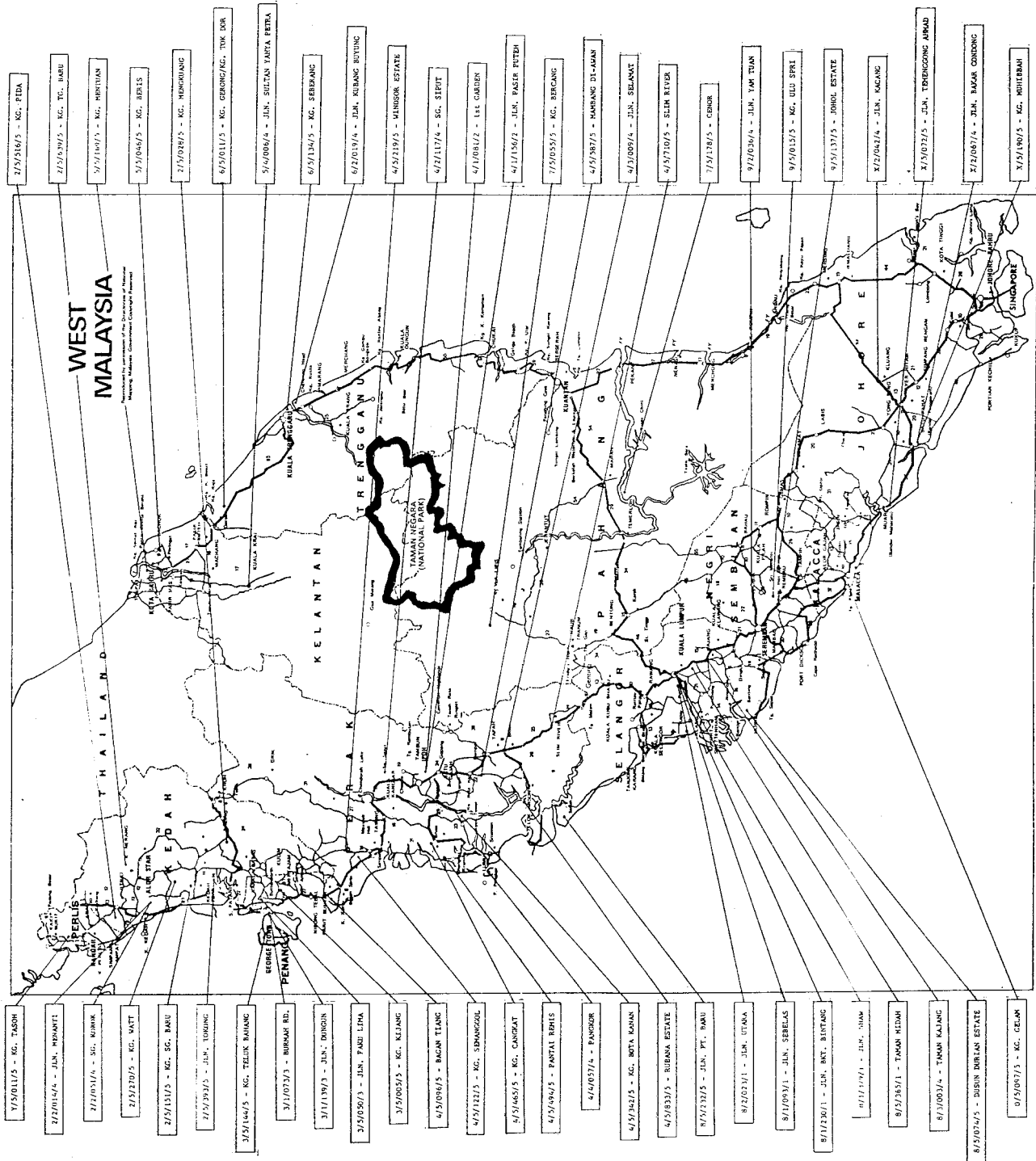
* Additional details about sample design, respondent selection, field personnel, and project control are in Robert Jones and Nyle Spoelstra, *The Malaysian Family Life Survey: Appendix C, Field and Technical Report*, The Rand Corporation, R-2351/3-AID, March 1978.

** Initially, 50 areas were selected, but one had to be dropped because it was then under curfew.

† The frame was originally created by the Malaysian Department of Statistics in 1966-67. Survey Research Malaysia purchased copies of all documents relating to this frame from the Malaysian Government in 1967. Since then, continuous listing and mapping procedures have been implemented, and the frame has been updated to reflect changes in population and residential development. There are currently 6125 PSUs in Peninsular Malaysia.

Figure 1

Location of Primary Sampling Units



where there was no ever-married woman, or where she was over 50 years of age; and (3) those that refused the interview or were for some other reason unsuitable, a total of 1262 households remained to complete Round One of the survey.* At the end of the second round, there were 1239 completed cases (98 percent of the first round cases); there were 1207 (95 percent of first round cases) at the end of the third and final round.

*Of the 2088 DUs initially selected, 826 were disqualified for the following reasons: 98 were demolished; 131 were vacant; 46 were locked up with repeated callbacks failing to establish contact; 136 had no ever-married woman; 285 had only an ever-married woman older than 49; 61 refused to cooperate; 55 were rejected for other reasons, including sickness or insanity of the ever-married woman and unusual languages that could not be handled; and 14 began Round One interviewing but could not complete it.

IV. RESPONDENT SELECTION

A Dwelling Unit can be occupied by two or more families or households, i.e., groups of people who have separate eating and/or cooking arrangements. It was decided that only one ever-married woman (EMW) would be interviewed in each Dwelling Unit because of practical problems inherent in conducting more than one set of interviews in the same DU, particularly in terms of loss of rapport with the respondent. Much of the information collected for the survey is either intimate (e.g., pregnancy outcomes, contraception) or confidential (e.g., details on the household's income and wealth).

The procedure adopted was to list all ever-married women in the DU in descending order of age. Each woman was then numbered and a selection made using the serial number of the DU on a Kish grid. The selected woman became the prime respondent, her husband (if available) the secondary respondent.

V. FIELD PERSONNEL

Survey Research Malaysia, Sdn. Bhd. (SRM) recruited and trained twenty-five female interviewers for this survey. They came from all parts of Peninsular Malaysia and were selected on the basis of educational qualifications and aptitude. Over 600 applications were received; 200 women were interviewed; 27 were selected for training; and 25 qualified to work on the project. Five of these became office editors and coders after they had received the full training and some field experience. The team of 20 field interviewers consisted of 10 Malays, 7 Chinese, and 3 Indians. The Chinese interviewers were selected for their ability to read Chinese and their knowledge of the main Chinese dialects in Malaysia (mainly Cantonese and Hokkien, but also Teochew, Khek, and Mandarin).

The interviewers underwent an intensive six-week training program,* after which the questionnaires were translated into the vernacular language and further briefings, class practice, and trial interviews were carried out. Independent back translations were obtained, and the instruments were finally submitted to full-scale field trials.

*

The program covered an introduction to basic interviewing techniques, map-reading skills, DU and respondent selection criteria, and questionnaire recording and checking procedures. Subsequently, the trainees were briefed on all sections of the questionnaires and began a systematic program of class observation and practice interviews.

VI. SURVEY CONTROL

The survey was controlled by a senior research executive at SRM under the supervision of two research directors. The project group consisted of a research executive, data processing executive, fieldwork executive, and community executive.

The research executive supervised typing, translating, printing, collating, and dispatching the questionnaires and forms. The task also involved maintaining a daily link with the field and supervising general office administration procedures.

The data processing executive was in charge of checking, editing, and coding the questionnaires as well as the punching, verifying, and computer editing of the data cards. Finally, he transferred all data to tape for dispatch to The Rand Corporation and rectified errors that had been subsequently identified.

The fieldwork executive was in charge of the three interviewing teams, which operated some distance apart. He controlled logistics, kept schedules, and ensured that team compositions answered the local language requirements. He was also responsible for back-checking and rectifying errors identified at the office-editing stage. He was backed up by three field supervisors who organized the interviewing on a day-to-day basis, assisted the interviewers in respondent selection, helped in obtaining cooperation from respondents, witnessed and checked the interviews, organized appointments, and completed daily records of interviewing. They also maintained the correct interval between interviews.

The community executive obtained information on the PSUs at the community level. When possible this information was collected in the PSUs; otherwise, it was taken from central files. In the PSUs, interviews were conducted with personnel from Government hospitals, clinics, schools, and district offices, and with community leaders. Collating the data was difficult because many PSUs are not self-

contained geographical entities--they may form part of a community, or may be made up of several smaller communities that are not homogeneous.*

Motivating the respondents was important. Small gifts of household and toiletry items were presented to them in the second and third rounds. In the first round, they were given a letter of introduction which told about the gift scheme, and about the general purpose of the survey. The supervisors were responsible for assisting the interviewers in obtaining a strong rapport with each household, and an effort was made to give the same interviewer the same household in all three rounds.

The field work began August 23, 1976, and was completed in August 1977. Editing, coding, punching, and checking the data continued until the end of January 1978.

*The sample PSUs are described in Fahmi Omar, *The Malaysian Family Life Survey: Appendix D, Descriptions of Sample Communities*, The Rand Corporation, R-2351/4-AID, March 1978.

VII. DATA PREPARATION

To check for logical consistency across the instruments, the same coder was used to edit all instruments from one household case. In the second and third rounds, cross-checks were made with the previous instruments for consistency and completeness.

A full codebook was drawn up for each instrument.* Punching was subjected to 100 percent verification, and computer programs were developed by SRM in Kuala Lumpur for logic and range checks and for sequence checks. After corrections and a final sequence check, the data were transferred to tape for dispatch to The Rand Corporation. Additional data checks, many involving cross-card and cross-questionnaire comparisons, were made at Rand. SRM then corrected errors and discrepancies.

*The Round One codes and checking procedures are detailed in Terry Fain and Tan Poh Kheong, *The Malaysian Family Life Survey: Appendix B, Round One Codebook*, The Rand Corporation, R-2351/2-AID, March 1978.

VIII. SUMMARY OF INITIAL RESEARCH FINDINGS

CONTRACEPTING, BREASTFEEDING, AND BIRTHSPACING^{*}

The retrospective and community data from the survey^{**} were used to investigate patterns and determinants of breastfeeding, contracepting, and birthspacing in Peninsular Malaysia. The incidence and the length of breastfeeding have been decreasing since World War II, and the use of modern contraceptives has increased rapidly since the early 1960s. Nevertheless, the proportion of closed birth intervals not protected by breastfeeding or other contraceptive practice has steadily increased, resulting in a fairly general decline in the average length of closed birth intervals. Although additional analysis of open birth intervals is required, this trend has probably tended to keep fertility rates from falling rapidly, particularly among younger women, and infant mortality rates from falling as rapidly as they might have otherwise.[†]

Moving beneath these trends, we estimated a regression model of the basic behavioral and biological relationships that connect birthspacing to its proximate determinants and to some of its more indirect causes at the community and program level. Relationships found between length of postpartum amenorrhea and its determinants are very close to estimates from a number of prospective surveys and clinical

^{*}This research is reported in detail in William P. Butz and Julie DaVanzo, *Contracepting, Breastfeeding and Birthspacing in Peninsular Malaysia: A Model of Decisionmaking Subject to Economic and Biological Constraints*, The Rand Corporation, R-2352-AID, forthcoming.

^{**}The retrospective data were prepared for analysis using a computer program described in Iva MacLennan, *RETRO: A Computer Program for Processing Life History Data*, The Rand Corporation, R-2363-AID/RF, March 1978.

[†]Our estimates indicate that a baby born at the close of a short birth interval has a significantly lower chance of surviving its first year.

studies. Length of full breastfeeding has the strongest influence, followed by length of partial (or supplemented) breastfeeding. Variables associated with the mother's nutritional status also have significant coefficient estimates.

The strongest estimated influences on breastfeeding incidence and duration are variables reflecting the mother's work experience prior to the child's birth and the availability in the community of substitutes for breastfeeding--infant foods and modern contraceptives. And there is the intriguing suggestion that proximity to a family planning clinic encourages breastfeeding, although not nearly as strongly as proximity to privately sold contraceptives discourages it.

In its capacity to delay the next birth, unsupplemented lactation is considerably less effective per month of use than the IUD, pill, and safe time (rhythm) methods, on a par with abstinence, and more effective than folk methods. Use of all these methods, including folk methods, is significantly associated with longer closed birth intervals in this sample. Moreover, there is a suggestion that use of modern contraceptives interferes with the role of lactation in extending postpartum amenorrhea.

As in the case of breastfeeding, contraceptive use responds significantly to variations in the community supply of modern contraceptives. The supply of infant foods also has a positive influence, as our model predicts. Women with more education and more wealth are much more likely to contracept and to do so with modern methods.

Infant mortality regressions show a strong salutary influence of both breastfeeding and the availability in the community of commercial infant foods. Infants with wealthier parents, better sanitary conditions in the home, and more highly educated mothers have significantly higher survival probability, as do those born near a doctor's office or hospital. Larger birth weight is significantly associated with higher survival probability.

Finally, our attempt to explain sample variations in birthweight shows that children born in a community near a nurse or medical clinic tend to weigh more. Proximity to a doctor or hospital has no measurable effect. Also, babies born at the close of a short birth interval tend to weigh less at birth.

The picture that emerges from these estimates, although incomplete, is one of systematic biological mechanisms and behavioral responses, both capable of being set in motion by community and program characteristics. In particular, declines in breastfeeding and increases in modern contraceptive use are associated (in these data) with the increasing cost of women's time at home and with the growing availability of modern contraceptives and infant foods, all of which have been part of the Malaysian development process.

Considering the inherent limitations of retrospective life history surveys, these initial analyses have pushed the data very hard, although only scratching the surface of what they have to offer. The estimates closely resemble results from prospective studies in a number of countries and are generally consistent with expectations from a model not specific at all to the Malaysian setting, suggesting that our methodology, and to some extent the resulting estimates, have wide applicability.

COMPATIBILITY OF CHILD CARE WITH
MARKET AND NONMARKET ACTIVITIES*

Using data primarily from the Round One Female Time budget questionnaire, we investigated household detail for time devoted to various housework activities, intrahousehold allocation of time to these activities, and the compatibility of these activities and various market activities with child care. We find that agricultural activities appear to be less compatible with child care than sales occupations or production occupations (mostly weaving, food and beverage

* This research is reported in Julie DaVanzo and Donald L. P. Lee, *The Compatibility of Child Care with Labor Force Participation and Nonmarket Activities: Preliminary Evidence from Malaysian Time Budget Data*, The Rand Corporation, P-6126, forthcoming.

processing, and dressmaking). Nearly 50 percent of women in sales or production occupations who have children aged 10 or less take some of these children with them when they work, as compared to 24 percent of such women in agricultural activities and 22 percent in service activities. Few women in other market occupations take their children with them when they work. Women who take their children with them generally spend less time in market activities and more time in nonmarket activities compared to women with similarly aged children not accompanying them. Women who take their children along when they perform out-of-home nonmarket activities may do so because of fewer available substitutes for the mother's time in the activity in question or in child care.

The greater the number of hours the wife works outside the home, the less she works in the home, and the more help she receives from husbands, children, and others (including nonhousehold members). Husbands also help more in families that include infants. In absolute terms, child care is the activity that loses most of the mother's attention when she increases the number of hours she works outside her home. In relative terms, child care and cooking exhibit the greatest reductions.

Household size and age composition are the most important determinants of the number of hours the household as a whole spends in nonmarket production. Although other family members help in large families and the wife's share of total hours is less in such instances, the number of hours she devotes to nonmarket production is generally positively related to family size. This suggests that higher fertility increases her obligations at home and reduces the number of hours she can participate in the labor force.

IX. FINAL COMMENTS

Several broad conclusions can be drawn from this survey project:

- o Although the survey was extraordinarily complex, it was successfully completed and the data were cleaned and organized for general use. We believe that similar surveys can be conducted in other less developed countries. The survey documentation that this project has produced should be helpful in this regard.
- o Initial analyses of these data show that comprehensive retrospective life history surveys and detailed time use surveys--the most innovative and risky parts of the project--can produce reliable data that support detailed statistical analyses of family behavior in less developed countries.
- o These initial analyses document the large changes that have occurred in contracepting, breastfeeding, and birthspacing in Peninsular Malaysia since World War II. More importantly, the analyses yield empirical evidence about the roles of particular community factors and public programs in contributing to these changes. Specifically, we provide preliminary estimates of the effects of the community demand for female labor, the private supplies of contraceptives and infant foods, and the proximity of public family planning clinics. Continuing analysis of these phenomena should provide detailed information about the direct and indirect impact of other community characteristics and public programs.