



MotherCare™

**TECHNICAL ASSISTANCE TO THE UNIVERSITY
OF INDONESIA CHILD SURVIVAL INSTITUTE:
THE INDRAMAYU PROJECT
MOTHERCARE INITIATIVE**

OCTOBER 1-9, 1989

James F. Phillips, Population Council

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TRIP REPORT:

**TECHNICAL ASSISTANCE TO THE UNIVERSITY OF
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I. GOALS AND PURPOSES OF THE CONSULTANCY

The Center for Child Survival, University of Indonesia has launched a project entitled "A Project of Family Planning and Child Survival Research." The design of this project calls for prospective monitoring of demographic dynamics. In a recent proposal to John Snow, Incorporated, the CCS has proposed a program of research through the MotherCare Project that will utilize the family planning and child survival research system to investigate the determinants of maternal health and perinatal survival.

Both initiatives propose to make extensive use of the methods for longitudinal data management that have been developed at the International Centre for Diarrhoeal Disease Research, Bangladesh. This consultancy was undertaken to review plans and progress in research systems development, with particular reference to data management activities. The data systems developed by the CCS may be generally useful in MotherCare projects to be fielded elsewhere.

This scope of work aims to develop the CCS research program as a prototype system that can be used more generally for neonatal survival and MotherCare research projects.

II. BRIEF OVERVIEW OF PROGRESS

A. Project Achievements in Establishing Field Research

Work on the BKKBN/USAID funded component of the Indramayu Project is in its sixth month. This project aims to research the relationship between fertility and child survival. The MotherCare initiative is essentially an add-on to this previously funded project. There are six stages of research systems development:

1. **Research planning.** Two proposals have been prepared: "A Project Proposal of Family Planning and Child Survival Research" (October, 1988) and "The Indramayu Health and Family Planning Prospective Survey: A Proposal for Maternal and Neonatal Health Modules." (August, 1989) Implicit in these initiatives, but not documented at present, is an intervention design. The Indramayu Project aims to test feasible interventions for improving maternal health and child survival and to measure the impact of a set of interventions on maternal and child morbidity and infant and child mortality. The MotherCare proposal is still in draft form, and will be revised and resubmitted in response to JSI/PC comments on the August draft.

2. **Site identification.** Using existing national survey data, census data, and archival health and family planning data, the CCS identified candidate sites where fertility and mortality are high, where urban influences are minimal, where health services are typical of the country, and where there has been no previous special project activity. These candidate sites and criteria for selection of study areas were reviewed by a CCS/GOI consultative group to ensure that key Government units were involved in the project planning process. The aim was to identify population laboratory sites that

could represent a credible area for policy relevant health services research. The selection of Indramayu and a matched comparison area has been a major research and government liaison activity of the CCS in recent months.

Exceptional care has been exercised in this site selection process. In researching the appropriate choice of a comparison area care has been taken to insure that areas are matched for health services, demographic characteristics, economic conditions, and ecological characteristics. The comparison area is not contiguous to the treatment area, thereby minimizing possible effects of contamination across treatment boundaries.

3. **Sample design and listing.** The appropriate design for a sample is implicit in the substantive goals of a project. The criteria for sample design are unconventional, and the sample design will constrain research from this project.¹ It is apparent, nonetheless, that the sample design has been carefully implemented. By the end of September, listing of the study area has been completed, mapping of sample areas is complete, and selection of households for a baseline survey has been finalized.

4. **The baseline survey.** An early decision has been taken to conduct a panel study involving the longitudinal observation of households. The design aims to ensure that a complete and representative sample of mothers and children will be identified, and followed prospectively. The baseline survey defines the study population and represents the initial entries into a database that will be updated over time (to include demographic dynamics and events during pregnancy).

A key set of covariates for research concerns the role of social and economic status indicators. An extensive questionnaire has been developed, tested, and implemented as a component of the baseline survey.

Interviewers have been recruited, trained, and assigned to study areas. A system of field supervision has been devised, field offices have been established, and liaison work in connection with the survey has been completed.

Work commenced on this survey in October, and plans call for completion of field work by mid-December. Forms to be used for collecting longitudinal data on demographic dynamics have been developed and tested. A plan has been developed for extracting data forms from the baseline survey database for use in the prospective arm of the study. Software for this application is under development.

Data processing for the baseline survey includes on-line editing and error trapping. Basic tabulation plans for the survey have been finalized.

Other modules of information are contemplated, to be fielded in connection with the longitudinal component of the study. Thus the current survey is viewed as the initial baseline in a series of such surveys focusing

¹ This will be discussed further, below.

on such issues as health behavior, birth practices, service exchanges, baseline health status, and the like.

5. The "core" longitudinal system. CCS plans call for the continuous monitoring of demographic dynamics, the identification of pregnancies, and special studies of pregnancy and perinatal events. The "core" of this operation is a simple to use system of recording demographic events to households --the skeleton of a more general purpose database for MotherCare research. This system monitors person-days of observation of members of the sample, household relationships, demographic events, the onset and termination of pregnancy, and key household characteristics.

Since baseline data for this system is now being collected that will change with time, the prospective arm of the Indramayu Project has already begun. Nonetheless, planning for the longitudinal data management operation is rudimentary at present. Finalizing this system should be an urgent priority so that longitudinal data can be processed as they are being collected.

We developed detailed specifications for field operations that can be used to direct data system development. A prototype field manual for the "core" system is attached (Annex A). Work has begun on a field trial of this manual.

6. The MotherCare module. There is a plan to generate a "sticker" whenever a suspected pregnancy is reported in the SRS core system. This will be affixed to a MotherCare module for the pregnancy and neonatal period. Whereas other aspects of the Indramayu system are routine updates of a longitudinal system, the MotherCare module will be a batch of data, to be compiled over time by an interviewer, and processed when the data set on a pregnancy is complete. The batch of data will be edited as a batch, but linked to the Indramayu database as a table.

Work on this subsystem is in the discussion stage. An aim of the project is to develop and finalize a component system by April 1, 1990.

B. Progress in Institutional Development

The CCS is a relatively new center for mortality research. Established in 1987 as a unit of the University of Indonesia School of Public Health, it has already established advanced research capabilities, to include data processing equipment and personnel, field research management structures, teaching and staff development plans, a publication program, and an administrative unit.

JSI support for research at the CCS would therefore involve incremental research resources and development assistance to an established institution. A major constraint to be addressed is the success of the CCS in launching initiatives and attracting donor support: Some 31 projects exist, although most relate to a single source of support --the PRICOR Project of the University Research Corporation. A serious consequence of the success of the

CCS is that the Center has more commitments than it can honor. Two new doctoral level research scientists have joined the staff, but new initiatives such as MotherCare, should fund the CCS to recruit critically needed staff for this project.

C. Summary

The Indramayu Project, in summary, has been extensively developed over the past few months. Its design is oriented to multiple research needs and objectives, reflecting funding from the Government of Indonesia for work in family planning and child survival. The challenge to the MotherCare Project, and to CCS investigators, is to design MotherCare research and interventions that are compatible with the broader aims of the CCS and yet consistent with the specific purposes of the MotherCare Project. Given the design of the field operation, an intervention study is indicated. Intervention experiments are a new activity, requiring a new capability at the CCS.

Given the impressive achievements at the CCS in establishing longitudinal mortality research systems in 1989, the Indramayu Project is likely to be a valuable resource for MotherCare work. This report comments on the more general scheme for data management, and the challenges ahead for utilizing this system for MotherCare research.

III. THE DRAFT MOTHERCARE PROPOSAL OF AUGUST, 1989

A. Proposal Review

The proposal submitted to JSI had four deficiencies that became the focus of much discussion:

1. The proposal fails to specify hypotheses and analytical aims in a way that clarifies why data are being collected and what will be done with them. General themes are spelled out, but sample sizes, research instruments, and operational plans cannot be evaluated in the absence of basic research planning. This limitation of the proposal underlies all other problems that we encountered.

The most serious consequence of the problems of linking operational hypotheses to project design concerns the sample. A dispersed sample with more clusters would have permitted assessment of maternal mortality at no incremental cost to the project.²

As it is currently written, the MotherCare proposal represents a data collection exercise without clearly articulated hypotheses, and little analytical link of aims and purposes of the MotherCare Project with data collection instruments. This is largely a problem with documentation rather

² We should note, parenthetically, that MotherCare Projects do not require maternal mortality assessment.

than a fundamental institutional problem: Discussions with CCS staff indicate that such plans are at an advanced stage of formulation. In the recommendations below, we will focus on issues that were discussed, but not adequately documented in proposals and plans.

2. The proposal does not specify an intervention. While it is argued by CCS staff that so little is known about the nature of risks to mothers or services available to rural women, that interventions cannot be identified at this time, there is a need for a strategy of research and action that would identify problems and feasible interventions for trial. In the absence of a clear link to health service policies and operations, the proposal appears too academic and too data driven. Again, however, much has been done at the CCS to reflect on the problem of improving maternal health services, and on alternative strategies for diagnostic research.

3. The lack of clarity about how the CCS is organized and how MotherCare activities relate to other activities of the Center. The organizational design of CCS staff engaged in the project is unclear and the overall delineation of roles within the CCS is not adequately specified. It is not clear from the proposal what JSI is being asked to support, and what is already funded through the USAID/BKKBN grant.

4. Detailed task planning has followed, rather than preceded data collection. Data collection has already begun, but insufficient attention has been paid to data management plans, data documentation, and analysis priorities. This has led to delays in computer software development and to the premature collection of survey data. Priority has been consigned to the collection of cross-sectional survey data on SES, when such data could presumably be collected at any time in the future. Baseline data collection commences the longitudinal arm of the study, but planning for longitudinal data collection, management, and analysis has not begun.

In the course of our review, it became apparent that these concerns arise because of deficiencies in project proposals and written plans. It is evident in discussions that much more planning of project directions has been undertaken than is apparent in documents. We have therefore encouraged the CCS to document these plans in a brief proposal to JSI, to document project organizational structure to clarify the delineation of roles and budget allocations, and to detail data management plans so that computer assistance can be efficient and productive.

B. Hypotheses and Analytical Aims

The notes that follow lay out examples of undocumented hypotheses and research plans that were discussed. Once such plans are documented, they should guide the data collection and data management process.

Several key hypotheses were discussed in the course of our field visit. The JSI proposal would be strengthened if such hypotheses were specified together with programmatic sequelae and possible interventions. Some illustrative examples of research discussed, but not documented are:

1. Hypothesis (1): There is a relationship between maternal nutritional status and birth-weight. This, in turn, explains variance in neonatal mortality.

Related program sequela: Nutrition education and intervention during pregnancy can improve nutritional status and birth weights.

Operations research hypothesis: Participation in Posyandu nutrition programs (or improved Posyandu programs) can improve maternal nutritional status.

Measurement requirements: Assess pre-pregnancy weight and weight gain in successive months of pregnancy, birth weights, and neonatal mortality rates. Record respondent participation in Posyandu meetings (by treatment and comparison areas).

Analyses:

Model (1a)

Dependent variable:

neonatal mortality odds

Independent variables:

weight gain

gestational change in maternal

weight/height squared

birth weight

Posyandu participation

Controls:

Pre-pregnancy weight/height squared

SES

Gestational Age

Parity

Model (1b)

Dependent Variable:

birth weight

Independent Variables:

gestational change in maternal

weight/height squared

Posyandu participation

Controls:

Pre-pregnancy weight/height squared

SES

Gestational Age

Parity

Sex

Model (1c)

Dependent Variable:

gestational change in maternal

weight/height squared

Independent Variable:

Posyandu participation

Controls:

Pre-pregnancy weight/height squared

SES

Gestational Age

Parity

Sex

Other analyses could be anticipated. Once analyses are specified in this fashion, data collection needs are clarified. To illustrate this, consider further MotherCare studies that could be pursued:

2. Hypothesis (2): Maternal anemia affects neonatal survival.

Program hypothesis: Iron folate distribution during pregnancy can improve nutritional status and birth weights.

Operations research hypothesis: Participation in Posyandu nutrition programs (or improved Posyandu programs) can reduce the incidence of maternal anemia.

Measurement: Hemoglobin in successive months of pregnancy, birth weights, and neonatal mortality rates. Record respondent participation in Posyandu meetings (by treatment and comparison areas). Record respondent recall of iron folate use or possession of a tablet package.

Analyses:

Model (2a)

Dependent variable:

neonatal mortality odds

Independent variables:

gestational change in maternal weight/height squared

birth weight

Posyandu participation

hemoglobin

Controls:

Pre-pregnancy hemoglobin

SES

Gestational Age

Parity

Sex

Model (2b)

Dependent Variable:

birth weight

Independent Variables:

hemoglobin

gestational change in maternal
weight/height squared

Posyandu participation

Controls:

Pre-pregnancy hemoglobin

Pre-pregnancy weight/height squared

SES

Gestational Age

Parity

Sex

Model (2c)

Dependent variable:

Hemoglobin at month x in pregnancy

Independent variables:

iron folate use

Posyandu participation

Controls:

Pre-pregnancy hemoglobin

Pre-pregnancy weight/height squared

SES

Age

Parity

Similar hypotheses were discussed for the role of tetanus vaccine, antenatal screening, and other issues related to maternal health care. All such hypotheses have implications for the collection of data, and should be specified in documentation. This type of research planning should precede planning of the MotherCare module.

Data that are unconnected to hypotheses or analysis plans should not be collected.

Note that MotherCare analyses discussed at the CCS imply that baseline mother information will be available on hemoglobin, height, weight, and possibly other variables such as Posyandu participation or health care systems utilization should be recorded. That is, one round of the longitudinal data system should be devoted to the collection of information that are to serve as controls for analyses of events during pregnancy. This baseline MotherCare module is not yet designed, and should precede the collection of longitudinal data on events during pregnancy.

C. The Intervention

So little is known about the determinants of maternal health and neonatal survival that it is difficult to design feasible interventions. Moreover, there is little systematic investigation of what services are provided to women, or even what the Government of Indonesia aims to provide. For this reason, no intervention is specified in the CCS proposal.

In the absence of an intervention, however, the study design appears to be overly academic, and lacking the practical applied focus that is required in the MotherCare framework, and evident in discussions of this initiative at the CCS.

We therefore recommend that the CCS document plans for developing the intervention as a first phase of the project, and acknowledge that the intervention phase cannot be specified at this time because of gaps in scientific knowledge.

Two broad avenues of research are discussed at CCS, but not documented:

1. There is a need for basic diagnostic research on the indicators of maternal health and predictors of neonatal survival.

2. There is a need for basic diagnostic operations research on the participation of women in the Posyandu system and the coverage of primary health care.

Once a systematic program of diagnostic research on these two broad areas is conducted, an intervention strategy can be devised. This general plan of action should be incorporated in the CCS proposal.

D. Research Task Planning

1. **The household cohort design.**

There have been delays in the preparation of software owing to changes in specifications and other project planning problems. There is a plan to monitor households as the basic unit of observation, and this plan provides the central rationale for JSI support for the CCS through the consultancy services of David Leon.

The "household cohort design," is a useful strategy, and a strong scientific case can be made for it. This technical rationale for this critical element of the Indramayu design is not justified in the proposal, however. This, in turn, will lead to criticism that the CCS is collecting social and demographic data that are extraneous to the MotherCare project. It may be argued, furthermore, that these data will become a distraction rather than a resource, and burden the CCS with a deluge of information at a time when the Center needs to be producing scientific results.

Assuming that the "household cohort design" is justifiable, great care must be exercised in deciding what data is essential, and what data "would be nice to have." Data that are merely nice to have, should not be collected.

Prospective data are, by definition, voluminous. Parsimony is a virtue in all such systems.

2. An argument for the "household cohort design".

The collection of data on mothers during pregnancy implies that pregnancies will be detected and a system of data collection pursued that will deal with the following difficult issues:

a. Careful definition of the risk set is required, so that pregnancies under study represent some representative sample of pregnancies in a study population. Even minor lapses in such definitions in the course of surveillance can lead to serious study biases, since mobility during pregnancy and following delivery is an important characteristic of Javanese traditions associated with childbearing. Detecting pregnancies, following them, and relating such events to a risk set is an important technical challenge that is best pursued in practical field situations by training workers to monitor simple concepts that they can understand -- the household, and who in the household is present and at risk.

b. Analyses require extensive cross-referencing of information on households with data on women. The storage and retrieval of household data represents a conventional way of storing and retrieving information that can be readily understood by interviewers and data managers. Attempting to short-cut the household to focus on particular members risks linkage errors and other problems.

c. Use of the Indramayu database permits MotherCare add-ons to more general research activities. The cost of establishing a system for tracking pregnancies would be exceedingly high. The cost of adding a module to a system for following mothers and children is not. The Indramayu design represents a model for using a mortality research system for the specific aims of the MotherCare Project.

3. Specific "Sample Registration System" task planning needs.

The system to be used by the CCS for data collection and management represents an adaptation of the Bangladesh Sample Registration System (SRS). An overview of this system has been documented elsewhere.³ The following comments assume familiarity with the SRS:

a. There is an urgent need to document the final procedure for the Household Record Book. Field work will begin in October for baseline data

³ See the paper by J.F. Phillips, Khorshed Alam Mozumder, David Leon, and Michael Koenig (1988) entitled: "The application of microcomputer data-base technology to longitudinal studies of survival: Lessons from a field study in Bangladesh," prepared for the seminar "Community-based Health Research in Mexico: A proposal for the initial stage (A regional seminar)," National Institute of Public Health, Mexico (October 25-28).

collection. This will launch the longitudinal system. At this point, however, the recording system for the longitudinal arm has not been finalized. The software for preparing this register must be finalized soon so that the books will be ready by January.

For household registers to be compiled, printed, distributed to workers, and placed in use by January 1 requires extensive computer systems development. Systems development, in turn, requires the following information urgently:

-- Detailed baseline survey data documentation:

Detailed information on the definition of households (who is a member and who is not) relationships within households to be defined by the SRS with convenient Bahasa codes for data recording and display,

Information about the fields required for names (number of bytes),

The structure of household codes for permanent identification of households and members,

The layout of household information, such as the content of the stub of the register, the Bahasa Language codes to be printed, and the like.

-- There is an urgent need to document procedures for the longitudinal component of the SRS.

Data from baseline surveys to be maintained in the SRS database. Some information is to be used for SES index preparation, and is not required for analyses. Consideration should be given to scaling and data reduction procedures to achieve this.

-- Interviewer instructions must be documented, but the immediate need is for information that allows for the preparation of the longitudinal arm of this study.

-- The basic specification for the longitudinal component of the SRS are undocumented.

The Household Record Book is a draft document. This must be finalized. The procedure for updating events is undocumented. It is insufficient to use the Bangladesh procedures. Bahasa codes must be developed and field procedures specified so that data entry software can be appropriately designed. Logic for the longitudinal arm of this project is complex, and computer methods are correspondingly complex to develop. In the absence of these specifications, work will be delayed. Longitudinal field work

cannot begin until this vital component of software development is completed.

--The interviewer manual for the longitudinal arm of the SRS is incomplete.

We have adapted a version for use in Indonesia from the Bangladesh version. This must be an indigenous operation, however, since many of the specifications will not be appropriate in Indonesia. External planning of interviewer instructions can have the unintended effect of weakening internal capacities to direct field operations.

b. There is a need to clarify and document the interventions to be tested in this study. Sample sizes, data design, computer operations, and the like are intended to answer questions. These questions are not clearly documented at the moment. This raises the possibility that study populations will be inadequate for the inferences desired, that the modules will not address critical questions, or that the entire SRS will be inappropriate technology for the CCS. Information discussions lend support to the view that the SRS is a critically needed technical resource for the CCS. For scientific integrity of work to be established, however, this argument must be established more formally than is now the case in the draft proposal.

c. There is a need to clarify the management structure for the MotherCare initiative of the CCS. The process of project planning and supervision appears to be overly centralized. A system of delegation of responsibility is needed whereby interventions and demographic research fall under team leaders who report to the project director. The SRS, in turn, has a field data component, a data management component, and a software development component. The field and data managers must be identified and assigned clearly defined roles for the documentation.

d. **The MotherCare Procedure.** The MotherCare procedure should consist of two batch mode systems for recording basic data about maternal health during pregnancy. This will involve a simple baseline assessment for all women, and a system for administering questions about maternal health during pregnancy. The questions to pregnant mothers should be asked monthly, and should address key questions about health and services during pregnancy.

A draft module could be most useful to the CCS if it were prepared as a component of the revised CCS proposal to JSI. This would permit time for expert comment and review prior to further consultant missions to Indonesia.

IV. NEXT STEPS

The CCS will be revising and resubmitting the MotherCare proposal to JSI. Along with this resubmission, there should be consideration of the following needs:

1. Incremental senior staff. Indramayu is a remote area, nearly 5 hours by road from Jakarta. Task planning for the intervention component of the project will be based in Indramayu, but professional staff visits to study areas will be intermittent. To develop a field based initiative with a sound intervention will require a full-time resident MCH expert in the Indramayu area. This person should be budgeted in the JSI proposal, and recruitment should begin.

Computer expertise will be required that is not presently available at the CCS. This expertise can be developed, however, if existing project staff are assigned to work situations where database management training can be administered. Consideration should be given to hiring a local consulting firm to manage the SRS on an interim basis, and train project staff in basic data management activities.

2. Data management needs. On this consultancy, we did not assess basic data management activities as planned. There should be a careful and comprehensive review of the flow of data from the field to the computers and to the field again. There should be a carefully designed system of data security and backup. There should also be a review of storage procedures, disk configurations, software needs, and other issues.

Mr. Leon should return to Jakarta to review this aspect of project development before data accumulate and problems develop. There may be no problem with current procedures, but extreme caution should be exercised given the extensive reliance on computers and data operations in this project.

3. Return consultancies.

a. David Leon, late 1989. Mr. Leon will be developing software for printing Household Record Books from the baseline survey database. He will also begin to develop the SRS longitudinal software when a completed field manual is available. There will be a need for him to visit Jakarta, install and demonstrate the Household Record Book printing software and review specifications from the manual with CCS staff. Logical checks, implicit in the manual, must be explicitly documented and agreed upon before a system can be developed.

b. J. Phillips, N. Sloan, and D. Leon early 1990. There will be a need to develop detailed plans for the MotherCare module. Much of the work can proceed, but a consultants mission on research plans, to be followed by a software development mission, would assist the CCS in finalizing plans for this work. All consultants missions should be timed to permit development of the MotherCare system by mid-April, 1990. At that date the CCS launches the second round of the SRS, and failure to complete planning will delay implementation by an additional 3 months.

**Annex B:
DRAFT SCOPE OF WORK**

**Technical Assistance to the Center for Child Survival,
University of Indonesia
November, 1989 - March, 1990**

David Leon

1. Aims and Objectives

The Center for Child Survival (CCS) has launched a project in Indramayu Kecamatan, West Java, to examine the relationship between family planning and child survival. A prospective demographic surveillance system is planned for that project that is modeled on the Bangladesh Sample Registration System (SRS). A scope of work has been undertaken to assist the CCS in using the SRS. A baseline survey has been launched that will define the population for longitudinal surveillance.

The CCS has proposed to utilize the SRS for monitoring events occurring during pregnancy, delivery, and the neonatal period. A proposal has been submitted to the John Snow, Incorporated MotherCare Project to support this activity.

The principal aim of this scope of work is to develop the SRS to a point where a MotherCare module can be added to the system and to develop an SRS procedure that can serve as a prototype for MotherCare projects in other countries.

2. Phase I: Preparation of Household Registers

The SRS is based on the concept of maintaining data in registers (as opposed to forms) so that field data procedures are analogous to database procedures. Software has been developed for entry of the baseline data on household relationships and the editing of the baseline survey.

Phase I will develop software for extracting household data from the baseline survey and printing household registers.

Phase I will address the question of how system support can be maintained in Jakarta. Consulting firms with database management staff will be visited and their capabilities reviewed.

A draft field manual has been prepared by the CCS which can serve as a basis for software development. There are issues to be clarified: logical edits and checks are unspecified and other key omissions will hamper software development in Phase II.

Phase I will entail ten days of work:

Work in Bangkok:

--Software preparation and testing: 4 days

Work in Jakarta (November, 1989):

--Travel 1 day

--Software installation and staff orientation 1 days

--Consulting firm review and assessment: 2 days

--Systems Planning for Phase II 2 days

10 days

3. Phase II: SRS Core Systems Development

The first round of the SRS may identify problems with the format of the Household Record Book. Time must be allotted to revising the format if this is required.

There must be a system for updating the database, printing errors, editing the database, and printing basic vital rates at the close of a round of interviewing.

This system will be developed in Bangkok by March 1, 1990.

The system will be developed in FOXBASE, and will undertake the following:

- Provide for on-line entry of demographic updates to the database,
- Provide for errors to be printed for supervisory action,
- Permit data correction and edits,
- Provide for routine printing of demographic rates.
- Provide for the printing of "stickers" for women who are suspected of being pregnant. These stickers will contain the information in the stub of the Household Record Book, for later use in the "MotherCare" procedure (Phase III).

Work will anticipate the need for a "MotherCare module" and involve a review of planning for this initiative. A prototype version of the field instrument will be reviewed. (If this instrument is not prepared on schedule, travel to Jakarta will be delayed.)

Work will involve the following:

Bangkok:

Software preparation:	20 days
Revision of the Household Record Book	1

Jakarta (late February):

Travel	2 days
Software installation:	2 days
Systems Planning (for Phase III)	4 days

29 days

4. Phase III: The MotherCare Procedure

There will be a batch of data collected for each SRS pregnancy. This will be maintained as a batch of data to be manually updated for events during pregnancy, delivery, and the neonatal period. When the cycle of data collection is complete, batches of pregnancies will be processed and stored as a table of the SRS. Procedures for this are not, as yet, developed at the CCS. The following tasks are nonetheless anticipated:

- A batch data entry and checking program will be needed.
- A program for merging data and reporting inconsistencies will be required.
- A program for reporting MotherCare rates will be used for routine monitoring.

This phase will require about 20 days of systems development work, and travel to Jakarta (March, 1990) for 4 days.

Time must also be allotted to systems revision.⁴

5. Phase IV: The Mothers and Children Procedures⁵

The MotherCare procedures are aimed at ascertaining the preventable sources of morbidity and mortality for mothers and newborn children. When interventions are developed for the Indramayu Project, they will serve as the dependent variables for analyses:

Two SRS components are envisioned, each comprising batches of data:

⁴ If specifications are carefully documented, and requests are not revised, 39 days should be adequate for preparing the core SRS and the MotherCare module.

⁵ Funding for this Phase is not yet identified, and will not be provided by the Mothercare Project.

1. Baseline assessment of indicators of maternal health.

In a cross-sectional survey of all currently married women of reproductive age, there will be an assessment of hypothesized predictors of maternal health and neonatal survival (weight and height). This will be done only once.

Systems development assistance will be required for the following tasks:

- An on-line data entry and editing procedure will be required,
- A procedure for reporting errors to supervisors will be incorporated in the data-entry module,
- Provision for incorporating the module into the SRS database will be required.

2. Assessment of the indicators of maternal health in the course of pregnancy.

In a special module administered to pregnant women, there will be a monthly assessment of the one indicator (weight) along with point prevalence assessments of fever, diarrhoea, cough, headache, and jaundice. Birth-weight, length, assessment of gestational age and other data on neonates will be required, plus participation in Posyandu and iron/folate consumption.

Systems development assistance will be required for the following tasks:

- An on-line data entry and editing procedure will be required,
- A procedure for reporting errors to supervisors will be incorporated in the data-entry module,
- Provision for incorporating the module into the SRS database will be required, and
- Provision for processing a batch of pregnancies and reporting key indicators will be required: change in weight, point prevalence rates, mean birth weights.

6. Phase V: Maternal and Child Health Modules (38 days)

BKKBN has supported the CCS to research issues related to fertility, child survival, and family planning. The CCS plans to add modules to the SRS which will generate data on contraceptive use dynamics, reproductive events, services to mothers and children, and other issues. The plan is to collect these data on a random sub-sample of the SRS. All women considered "eligible" for contraception will have an entry in a register that will resemble the Bangladesh "Record Keeping System" (RKS).

It will differ from the RKS in two respects:

--It will be run on a sample of 20% of the SRS currently married women of reproductive age,

--It will contain considerably less detail on events to mothers and children than is maintained in the Bangladesh system.

Developing the MCH procedure will require 30 days of systems development and two trips to Indonesia (8 days).