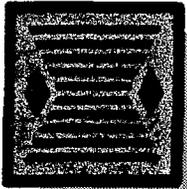


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**THE IMPACT OF FOOD AND CASH TRANSFERS
ON HEALTH AND NUTRITION:**

**AN EVALUATION OF THE BONOS (BMI) AND
PL 480 TITLE II MCH PROGRAMS IN
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Jere R. Behrman, Miguel Calderon, Sally Creliia and Magdalena Garcia**

September 18, 1995

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ACRONYMS

BMJF	Bono Mujer Jefe de Familia
BMI	Bono Materno Infantil
CARE	Cooperative for American Relief
CESAMO	Centro de Salud con Medico
CESAR	Centro de Salud Rural
CEDIN	Centros de Desarrollo Integral del Niño
CNC	Centros de Nutrición Comunitarios
CSB	Corn Soy Blend
FP	Family Planning
JNBS	Junta Nacional de Bienestar Social (National Social Welfare Board)
MCH	Maternal and Child Health
ME	Ministry of Education
MSP	Ministry of Health
ORT	Oral Rehydration Therapy
PAC	Programa de Alimentación Complementaria
PAMI	Programa de Alimentación Materno Infantil
PMA	Programa Mundial de Alimentos (WFP)
PRAF	Programa de Asignación Familiar
RDA	Recommended Daily Allowance
SFB	Soy Fortified Bulgur
WFP	World Food Program

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1. SUMMARY

This report presents the results of a study on the impact of food and cash transfer programs on poverty, health services and food consumption in Honduras. The following programs were evaluated: 1) Bono Materno Infantil program (BMI/PRAF), which consists of monthly cash transfers (coupons or "bonos") through health centers; 2) Programa de Alimentación Complementaria (PAC) which is an on-site, daily feeding program at community-based nutrition centers; and 3) Programa de Alimentación Materno Infantil (PAMI), a monthly take-home food distribution program. The purpose of the report is to provide a basis for discussions on improving the cost-effectiveness of these programs.

The main source of data used to draw inferences about program effectiveness is a survey of 1418 households participating in the study programs and a no-program group, in Western Honduras. A survey of 60 health centers and 20 community-based nutrition centers was also conducted. Multivariate analysis was used to control for differences in characteristics of individuals, households, communities and centers to determine program impacts. Targeting and coverage issues are explored through analysis of data from the national household survey on income, expenditures, consumption and nutritional status conducted in 1993/94 (USAID/ADAJ).

The results show:

1. LIMITED OVERALL COVERAGE: The three MCH programs together covered a small proportion of households experiencing poverty and children suffering malnutrition. We estimate that at 1993 beneficiary levels, the combined programs had the capacity to cover less than 15 percent of the households in need, if the programs had been perfectly targeted to the poor and there was no program overlap. However, data from the national household survey of 1993/94 that takes into account program overlap, shows less than ten percent of all households participated in one or more MCH program.

2. WELL-TARGETED: All food and cash transfer programs appeared to be successfully targeted to the more needy segments of the population, rather than to higher income groups in the country. This is in marked contrast to the availability of public services in Honduras. For example, education, electricity and health, are either skewed in favor of the better-off (education, electricity) or equally distributed (health). Both the bonos programs (BMI and BMJF) and merienda escolar (school feeding) are the best targeted of all transfer programs reviewed. In addition to achieving household-level targeting by income, the bonos (BMI) program reaches households with malnourished children. PAMI and PAC (food program) households also showed a higher prevalence of malnourished children than no program households.

3. VARIED BENEFITS BY PROGRAM WITH SMALL BUT POSSIBLY IMPORTANT EFFECT ON RESOURCES OF POORER HOUSEHOLDS: The annual value of program benefits transferred averaged 170 lempiras per household in the PAMI program, 300 lempiras per household in the BMI program and 560 per household in the PAC program. The value of benefits relative to all participant household incomes were: 2 percent for PAMI, 4 percent for BMI and 7 percent for the PAC program. For the lowest quintile, the benefits were in the range of 3 percent of household income from PAMI, 5 percent for BMI and 10 percent for PAC.

4. HEALTH SERVICES UTILIZATION INDUCED BY FOOD PROGRAMS: Participation in the PAMI (take-home food) program was significantly associated with the number of preventive health visits made for maternal and child health services to CESARs and CESAMOs. The bonos program of cash transfers showed no significant relation. Provision of food rather than cash, therefore, seems to have induced stronger links with preventative health services.

5. NO EVIDENCE OF NEGATIVE EFFECTS ON QUALITY OF HEALTH CENTER SERVICES DUE TO PROGRAM ADMINISTRATION: The quality of services provided by health centers was assessed through observations of client-provider interactions, and use of check lists developed for each of the following types of visits: prenatal care, growth monitoring, diarrhea case management and ARI case management. There was no evidence that the quality of services provided by health centers implementing the BMI and PAMI programs was lower than in non-program centers.

6. NEED FOR IMPROVED EDUCATION GENERALLY AT HEALTH CENTERS: The results of the observations of interactions between providers and clients for each type of visit identified a number of areas for strengthening in health centers, both those participating in the food programs and those not participating. In general, there was insufficient attention to child feeding education and counselling mothers on various aspects of prevention. The disturbing finding from a KAP survey of mothers on questions concerning maternal/child health and infant feeding is that the vast majority of mothers from all groups are not aware of, or not practicing, the most critical maternal health and child survival actions that they need to take. Family planning services and education were seriously deficient.

7. LIMITED MATERNAL AWARENESS AND PRACTICE OF CRITICAL MATERNAL/CHILD HEALTH PRACTICES, THOUGH SOME EVIDENCE OF POSITIVE PROGRAM IMPACT: Mothers participating in PAMI had higher knowledge, awareness, and practices (KAP) scores. Bonos (BMI) participants also had higher scores than no-program mothers. The results are reassuring in that although bonos program participants did not demonstrate increased health center visits, the first step in the pathway to improved utilization may be taking place. Although the improvements attributable to programs were significant statistically, they are small in relation to desired objectives.

8. ALMOST HALF OF HOUSEHOLDS BELOW RECOMMENDED CALORIE CONSUMPTION AND LARGER DEFICIENCIES OF VITAMIN A, THOUGH NOT OF PROTEIN: On average, calorie consumption was 2860 \pm 1020 per adult equivalent per day (compared with a recommended level of 2800 per AE/day). However, this average masks important disparities among groups of households and within households. An estimated 30 percent of households did not consume even 80 percent of recommended calorie levels. Individual dietary intake data showed that pregnant women's food consumption is especially poor. Household protein consumption averaged 64 grams \pm 26 per AE/day, well above adequate levels. Average vitamin A consumption was extremely low, only 25 percent of recommended levels, and even lower among pregnant and lactating women. Strengthening broad-based micronutrient strategies are important given the severe shortage of vitamin A (and possibly other micronutrients) in Honduran diets found in this study.

9. FOOD PROGRAMS, BUT NOT CASH TRANSFERS, HAVE SIGNIFICANT POSITIVE EFFECTS ON AVERAGE HOUSEHOLD CALORIE CONSUMPTION AND POSSIBLY ON PROTEIN CONSUMPTION: PAMI and PAC have positive and significant effects on caloric consumption of households, controlling for the other variables. Each household in the PAMI or PAC, was consuming an estimated 250 to 350 more calories per AE than the no program group. Impacts on protein intakes per household AE were also positive and significant for the PAMI program. The bonos program showed no significant difference from the no program group. These results control for other factors influencing household caloric and protein adequacy including: income, household size and composition (larger households and those headed by women tend to consume fewer calories), seasonality (food scarcity was associated with lower calorie adequacy and rainy season with higher calorie adequacy), and distance from food market (lower adequacy).

10. FOOD PROGRAMS, BUT NOT THE CASH TRANSFERS, ALSO HAVE SIGNIFICANT POSITIVE EFFECT ON CALORIE AND PROTEIN CONSUMPTION OF ADOLESCENT GIRLS AND WOMEN: When intakes of adolescent girls and women were examined, both food distribution programs (PAC and PAMI) showed positive and significant effects on calorie consumption - 200 per person in PAMI and 300 per person in PAC - after taking into account other individual, household, and community differences in the study groups. The food programs also showed a positive and significant effect on protein consumption of adolescent girls and women relative to their recommended levels of intake.

11. CHILD CONSUMPTION OF PROTEINS WAS INCREASED BY ALL PROGRAMS, OF CALORIES WAS INCREASED BY THE FOOD PROGRAMS, AND VITAMIN A CONSUMPTION WAS INCREASED BY THE PAC PROGRAM: Both food programs (PAC and PAMI) have positive and significant effects on calorie consumption of children relative to their recommended levels of intake. The magnitude of the effect was approximately an additional 170 calories per day for the PAMI group, and approximately 185 additional calories for the lactarios group as compared with the no program group. The bonos program showed no significant difference from the no program group. Protein consumption by children was significantly higher in all programs, including bonos BMI: 5

grams in the PAC program, 4 grams in PAMI, and 3.5 grams higher in the BMI group. The PAC program showed a positive and highly significant effect on vitamin A consumption of children.

12. NEED FOR IMPROVED HEALTH SERVICES AND INTEGRATED FAMILY PLANNING SERVICES:

The findings suggest the need to strengthen the quality of health services provided by CESARs and CESAMOs. The lack of family planning services provided through CESARs and CESAMOs is a particularly serious gap with broad implications. All the outcomes examined in this study through multivariate analyses, pointed to the detrimental effect of large family size in Honduras, after controlling for other factors. Improved family planning services could improve welfare significantly if there are unwanted births that place unintended pressure on household resources.

13. INFRASTRUCTURE DEVELOPMENT IN RURAL AREAS ASSOCIATED WITH WIDESPREAD BENEFITS:

The importance of infrastructure development in remote rural areas is considerable and pervasive. In almost every analysis undertaken in this study, one or another of the following variables were found to play a critical role, after controlling for other factors: whether or not the community was connected by paved roads, had electricity, piped water and sewer systems, and access to food markets.

In conclusion, the PAMI program has significant positive impacts on health services utilization and food consumption by households, women and children. The PAC program has significant positive effects on food consumption. The BMI program showed little evidence of these impacts. It appears to function more successfully as a means of cash transfer than as a means of improving maternal and child health, based on the outcomes included in this study. However, with more consistent (uninterrupted) implementation and stronger emphasis on accompanying services, in particular, education on maternal and child health and health services, the BMI has the potential to make a difference with regard to child and maternal health, given that it is successful in reaching the poorest households.

2. INTRODUCTION

Honduras is one of the poorest countries in the Western Hemisphere, with an estimated population of 5.3 million in 1993 (World Development Report, 1995). Extreme poverty affects over 50% of the population and nearly 80% of the rural population, which constitutes 57% of the total. The national economy at US\$600 per capita GNP, lags behind all but Haiti, Guyana and Nicaragua in the region. In recent years, economic stabilization and adjustment programs are reported to have increased income earning opportunities in agricultural and export-oriented activities, but increased hardships for net consumers of food in rural areas and for urban dwellers. According to the national household survey of 1993/94 (Preliminary Tables, Feb. 1995, USAID/IMPACT), more than half of all Honduran households - both urban and rural - consume less than 75% of recommended caloric needs. In rural areas almost half of all children under five (45%) are stunted; nationally, some 40% of all children under five years are stunted.

In response to this situation, USAID has provided food commodities (PL 480 Title II) under its MCH programs implemented through rural health centers and community-based nutrition centers for over three decades. The programs are called Programa de Alimentación Materno Infantil (PAMI) in which take-home commodities are provided monthly from health centers, and Programa de Alimentación Complementaria (PAC) in which daily feeding is provided on-site to selected children and mothers. In 1990, the World Bank and other donors including USAID, assisted the Government of Honduras in initiating a cash transfer or coupon program (bonos) implemented through health centers - the Bono Materno Infantil (BMI) program. A special entity, "Programa de Asignación Familiar" (PRAF), was formed to administer this program. The objectives of the bonos program are to subsidize the incomes of the poorest segments of the population, and to provide a safety net against food insecurity, and control malnutrition during a period of economic adjustment in the country. Other bonos and food distribution programs are implemented through primary schools, and a separate series of reports deal with the assessment of school-based programs (Rogers et al 1995, Phillips et al 1995).

The presence of both food distribution and bonos programs, in similar communities concurrently, provided an opportunity to assess the relative costs and effectiveness of cash versus food subsidies in terms of poverty alleviation, food consumption and increased utilization of health services. The LAC HNS project therefore agreed to include this as part of a broader effort to document the costs and effectiveness of nutrition activities in the region.

USAID was asked by GOH and other donors to monetize food commodities and support the expansion of the bonos programs instead of food distribution. This was the policy relevance of the study initially. Most recently (May 1995), USAID's primary implementing agency of Title II food programs in Honduras - CARE - has proposed a restructuring of its own portfolio. This includes shutting down MCH (health center- and lactarios-based) food distribution in 7 out of 10 departments where they now operate, and instead, concentrating

on the 3 most impoverished departments with the majority of food and monetized food used for Food For Work projects to build infrastructure. Upon USAID's urging, CARE has agreed to reconsider this decision in light of the results emerging from this study. It is hoped that a comparison of the costs and effectiveness of the programs would assist GOH, USAID and CARE in these decisions. This report provides information on the effectiveness of the programs. The cost estimates of each program are reported in a companion volume (Fiedler ET AL, 1995).

In terms of the broader relevance of this study, the World Bank is promoting expansion of bonos-type transfer programs in other Latin American and Caribbean countries, and would like to demonstrate its cost-effectiveness based on the Honduran experience. Globally, USAID's Title II programs have been among the least well evaluated and costed programs, and methods of assessment used in this study are of interest to others in developing their own evaluations.

Also, food and monetary resources (dollar and local currency funds) for USAID and for Ministries of Health are declining rapidly. An important concern of USAID missions worldwide, is whether and in what form food aid should be continued. Comparative evaluations of different types of food distribution programs and alternatives to food distribution are therefore of interest.

The report reviews the coverage and targeting of each of the three MCH programs: bonos (BMI), PAMI (take-home distribution through health centers), and PAC (on-site feeding at community-based nutrition centers). It presents estimates of impacts on the following health and nutrition indicators: number of visits for preventive maternal and child health care by households participating in each program; quality of health services at participating health centers, and the adequacy of calorie, protein and vitamin A consumption of households, women and children.

3. METHODOLOGY

The study is a cross-sectional comparison of MCH programs. It is not an experimental study in that households were not assigned at random to program groups. Rather, comparisons are made of randomly selected households and individuals who participate in each program. A control group of households residing in areas where health centers do not distribute any benefits are included as a fourth group. A simplified illustration of the study's conceptual framework is in Figure 1 and a map showing the study areas is in Figure 2. Multivariate analyses were conducted to control for dissimilar characteristics of participants in each program or non-program group. Lists of variables at the individual, household, health center/lactario, and community levels used for each type of outcome are in Annex A.

3.1 CONCEPTUAL FRAMEWORK AND OVERVIEW

The study is designed to elucidate the nature and magnitude of impacts of transfers of cash and food on household behaviors related to food, nutrition and health. The conceptual framework is based on existing literature on the behavior of households with respect to health and nutrition (Pinstrup-Anderson 1993, Behrman and Deolalikar 1988, Rogers 1993, Kennedy and Alderman 1987, Mora et al 1990, Anderson 1981, CARE 1994) and evaluations of the bono program in Honduras (Bitran and Heinig 1992, INCAP/PAHO 1993, Nervi 1993). In summary, the nature and magnitude of effects and cost-effectiveness of programs depend upon their design, implementation, and on household response. Institutions and agencies may deliver services and distribute subsidies but it is the household that decides whether and how to take advantage of them. Decisions about time and budget allocations are made by households to get the most benefit out of available resources. This includes decisions about whether to participate in programs, how to distribute resources among individual family members, and how to convert resources from one form to another, or to alter their end use. Even "well-designed" programs can fail to have positive effects if the political, social and economic constraints as perceived by households are not taken into account. This study emphasizes program impacts at the household level and assesses different behaviors expected to result from program participation. Specifically, household behaviors related to the use of health services and food consumption of households and individuals within households are the focus of the assessment.

The relationships among program participation and intended impacts on household behavior, and factors affecting both of these are summarized in Figure 1. In the health centers-based programs, the selected households with children and/or pregnant or lactating women are expected to collect their bonos or food commodities monthly from health centers and are informed about practices they need to comply with in order to continue receiving benefits. The additional resources provided as food or funds, and conditions placed on participation are expected to increase the knowledge, attitudes and practices (KAP) of the households with respect to health and nutrition. As a result, the use of preventive health services is expected to increase, child feeding practices are expected to improve, and food consumption by young children and women of reproductive age is expected to improve.

The programs are structured with the intention of influencing household behaviors regarding how resources are allocated among competing priorities, and among individual family members. For example, bonos are distributed at health centers to encourage frequent visits for preventive health care; food distributed in the PAMI program at health centers is intended to encourage increased food consumption; and in the lactarios program, feeding selected groups (young children and pregnant or nursing women) is intended to selectively increase the food consumption of these individual family members.

The programs are intended to reach poor households. Targeting is accomplished through locating the programs in areas with a high concentration of poor households (BMI, PAMI, PAC). In addition, selection of particular households is based on eligibility criteria including

presence of pregnant or nursing woman or child under age five (BMI program) or under six (PAC) and presence of a malnourished child (PAMI, PAC and frequently, BMI).

The effectiveness of programs depends to a large extent on whether they are successful in alleviating critical household constraints in practicing the desired behaviors. For example, if food is scarce, the amount given to young children at nutrition centers may be withheld from that child at home and redistributed to other family members, resulting in no net increases in nutrient intakes for the targeted child. Similarly, if there is a heavy demand on women's time, increasing the requirements for frequent visits to health facilities may not be successful if women have to spend substantial amounts of time to comply. Program implementers may view the programs (as providers of "free" benefits) differently from participant households who may incur costs in forms of wages or home production foregone, cash for transport, contributions required from participants and others. Thus the value of the benefits to the household may be less than the value assumed by implementers. The results may be either lower participation or a smaller than anticipated effect on food consumption or use of health services. The social and political costs of participating in a visibly targeted program, and perceived unreliability over time of their real benefits can further lead to reduced participation and thus to lack of program success. These factors are identified and some are addressed in this study.

Because the desired program outcomes can be influenced by other factors (household and community characteristics, for example), differences among groups of households may result in erroneous conclusions if it is assumed that these differences are due to program effects. Since the design of the study is not based on random assignment to program groups, we have attempted to control for differences in household (as well as individual, community and program site) characteristics through multi-variate analysis with a large number of controls for individual, household and community characteristics. This procedure controls for observed differences, but it is possible that other (unobserved) differences remain which are not correlated with the observed difference and we could not control.

The primary focus of this study is health services use and food consumption behavior of households and of children and mothers within those households. In addition, there has been a widespread concern that health center based programs tend to burden health staff and that supplies are inadequate to cope with the increased volume of visits due to new benefits being provided. The concern is that quality suffers and undermines the benefits of more visits. This is addressed through an analysis of program effects on health services quality for the two health center-based programs (PAMI and BMI).

3.2 SAMPLE AND DATA COLLECTION

The study consists of several separate surveys conducted at health centers, community-based nutrition centers (lactarios, CEDINs, CNCs), households and communities. **Table 1** summarizes information on the surveys conducted and type of information obtained. Details of the organization of pre-tests and training, pilot surveys, substitutions in the original

samples and sampling methods, field work and logistics, data management and data quality control procedures used are described in Magnani (1994), Tatian (1994) and Garcia and Montoya (1995). Description of transformations for estimating caloric and nutrient values of foods consumed are in Ohri-Vachaspati (1995).

In general, random sampling principles were followed at each stage. Substitutions were less than 10 percent. Samples sizes were over 95 percent of targets. Rotation of interviewers and supervisors across program groups, and concurrent data collection across seasons and program groups was followed to prevent confounding due to interviewer bias and seasonal differences. The main problems encountered during field work were: unpassable roads especially in the rainy season, lower than expected volume of health center clients; health centers not functioning on visit days due to strikes/training/campaigns; and difficulty in finding the mothers of focus children. The fieldwork was delayed by 6 months when the bonos program was suspended in early 1994.

3.2.1 Survey of Health Centers and Community-Based Nutrition Centers

SAMPLE: Lists of government health centers and community-based nutrition centers (lactarios) located in Choluteca, Copan, El Paraiso, Intibuca, La Paz, Lempira, Ocotepeque and Santa Barbara departamentos (states) were drawn up. From these, centers located in municipalities rated as "mal", "muy mal" and "deficiente" - based on poverty indicators developed by the Honduran fund for social investments (FHIS) in 1992 - were selected as the sampling universe.

Health centers and lactarios participating in other (non-CARE or non-bonos) programs were excluded from the sample frame. This was done to remain consistent with the costing study which was limited to the PRAF/bonos program and CARE's food distribution programs through health centers and lactarios. The health centers and lactarios were then organized into the following groups:

- Health centers where the food distribution (PAMI) is implemented
- Health centers with the coupon (BMI) program
- Health centers with neither the food nor the coupon program
- Lactarios/CNCs/CEDINs where the PAC program is implemented

From each list, 20 centers were randomly selected. The final sample of health centers is shown by Health Region and Area in Table 2. The sample including lactarios is shown in Table 3 broken down by department. Out of a total of 877 health centers and 1,100 lactarios/CNCs/CEDINs in the country, 60 health centers and 19 lactarios were included in the sample.

DATA COLLECTION: The survey team for the study of health centers and lactarios consisted of three supervisor-level staff. Four data collection instruments were used: 1) a form to record historic trends on number of visits extracted from health center records and

infrastructure/inventory data, 2) a questionnaire administered to staff and directors of health centers or lactarios, 3) a set of observation records (one for each of the following: prenatal care, growth monitoring, family planning, diarrhea, ARI), and 4) a patient satisfaction exit interview questionnaire. The last two were implemented only at health centers. On average, data collection took four days at each health center in two rounds (July-November 1994 and in January-April 1995). Each lactario took considerably less time (one-half day) and was visited only once (July-November 1994) mainly because no direct observations were conducted nor were client satisfaction interviews held. A series of questions on program costs at the center level were also included in the questionnaires, and results of this are reported in the cost study report (Fiedler, 1995).

3.2.2 Household Survey

SAMPLE: Lists of program participants (individual children and mothers enrolled in the program) were drawn up in each randomly selected center. In the control (no program) health centers, the sample frame consisted of lists of households with children under 5 years of age, used for immunization programs. The participants were grouped by community. Communities were selected randomly, followed by random selection of households within communities. A fixed number of 18 individuals (mothers or children) were selected per health center; these were selected from each community in proportion to the total number of beneficiaries per community. If two individuals from the same household were selected, another participant was selected until 18 households were identified. The individual program participants selected constitute the "focus" mother or child. Each focus child's mother is considered a focus mother for the KAP survey, and each focus mother's child under 5 years is considered the "focus" child for the collection of anthropometric and morbidity data. Table 4 shows the final sample of households by department in each program group.

DATA COLLECTION: The data collection instruments consisted of several modules: 1) household characteristics; 2) expenditures; 3) three days of 24-hour recall of dietary intakes for the household, one mother, and two children (up to the age of 9 years, at least one of whom was below 5 years); 4) food prices paid; 5) use of health services; 6) knowledge and practices on health, child feeding, and intrahousehold food allocation; 7) height, weight measurements and 15-day morbidity recall for all children 0-59 months; 8) household use and preference for bonos and rations; and 9) a fertility and contraceptive use module that was developed by and will be analyzed by Magnani et al at Tulane University later. Four teams initially and later six teams of one supervisor and four to five interviewers each were used. Data collection was completed between July and December 1994.

3.2.3 Community-Level Surveys

The communities of which participants were residents, were selected for community level data collection. Three instruments were used: 1) a health and family planning services availability module; 2) infrastructure recording form; and 3) food prices record. Supervisors of the household survey teams collected these data.

3.3 DATA MANAGEMENT AND ANALYSIS

Questionnaires were first reviewed, corrected and completed in the field by supervisors. After every 2 weeks of data collection, field teams spent a day in Tegucigalpa checking questionnaires for use of correct units and codes. The questionnaires went through another screening by an independent team of reviewers who were trained with the field data collection teams. After they were cleared for data entry, the data were entered in SPSS or COBOL. Data on selected variables were screened and problems resolved with interviewers. Descriptive tables were prepared and multiple regression models were analyzed using SPSS for Windows. The following effects or outcomes of the programs were estimated using multiple regression models:

- Number of visits for pre- and post-natal services, for growth monitoring and vaccinations for children, and combined preventive health care visits.
- Household food consumption (calories per adult equivalent, protein per adult equivalent).
- Women's and children's food consumption (caloric adequacy, protein adequacy, and vitamin A adequacy).

Details of exposure and outcome variables and results are provided in the following sections.

4. PROGRAM DESCRIPTIONS

Beneficiaries in all three programs are selected for their poverty and risk of malnutrition. All programs are oriented to benefitting directly disadvantaged groups whose special needs are not adequately met through regular sectoral policies and programs. Though similar in their objectives, the three programs function in different ways.

4.1 OVERVIEW

Figure 3 shows the number of beneficiaries in each program. The bonos program, though it started much later than the food programs, was almost as large as the two food programs combined in 1993. The bonos program does not limit the use of coupons to food. Bonos are distributed through primary schools and health centers. The program is administered through a specially formed government entity - PRAF - that receives funds from national and international sources. The food distribution programs are administered by CARE through schools and health centers as well, and in addition through community-based nutrition centers. The value of food commodities shipped to Honduras in 1993 is estimated to be US \$4.2 million. This is less than 2 percent of the commodities shipped worldwide under PL 480 Title II. Food commodities are shipped from the United States to Honduras for direct distribution. Other programs, such as World Food Program's food distribution through health centers is smaller in number of beneficiaries, ARE not included in this study.

The food distribution programs have been implemented since the 1950's and 1960's in Honduras. The chief delivery systems and counterparts for the food programs are the Ministry of Health's network of rural health centers and the JNBS (Junta Nacional Bienestar Social) network of approximately 1,100 community based nutrition centers (lactarios, CNCs, CEDINs).

The bono program, administered centrally through PRAF, complements the staff of Ministry of Health's area-level and health center level staff in distributing and supervising the bonos. The bono program began with one distribution to approximately 8,000 beneficiaries in December 1990, expanded to 50,000 and 55,000 beneficiaries in 1991 and 1992 respectively, and again expanded to 117,000 - 108,000 in 1993 and 1994, respectively. It is much newer than the food programs. Unlike the food programs that have remained stable and uninterrupted, the bonos program was suspended due to budget concerns when the newly elected current administration came to office in early 1994. The program did not resume until May 1994. This interruption may make evaluation more difficult because participants in the program in the second half of 1994 when the household data were collected may have had doubts about the permanence of the program and therefore behaved differently than they would have had they thought that the program was stable.

While the quantities and mix of food rations have remained constant, and thus their value has been maintained in the face of price inflation, the purchasing power of the 20 lempira bono declined considerably during 1990-1994. See changes in consumer prices during 1990-95 in Figure 4. In early 1995, the value of bonos were increased to 30 lempiras.

Unlike the two health center-based programs, the lactarios program requires daily visits to the centers by enrolled children and women to consume the food, which is cooked daily. Based on the nutritional status of the child, each beneficiary receives one to several meals and snacks per day. The location of these centers is in more remote areas and includes small communities, unlike health centers that are more centrally located and accessible to a larger catchment area. The catchment area for each lactario is smaller than that of the monthly distribution programs (rations and bonos) implemented from health centers. The on-site feeding program at community-based centers, functions with considerably greater community involvement than the health center based programs, and also has greater variability in implementation and quality than health center programs. In addition to growth monitoring and talks about health and nutrition to mothers, some of the community-based nutrition centers provide preschool education.

While 1994 may to some extent be considered part of the start-up phase for the bonos programs (in part because of the disruption in late 1993 and restart in 1994), 1993/94 can be considered part of the phasing over stage for CARE food programs. For several years, CARE has been preparing to hand over management responsibilities for all food distribution programs (except food-for-work) to government counterparts. During 1993 CARE provided considerable training to counterpart agencies in management of food distribution programs. This included several workshops and training courses on a range of topics including

estimation of commodity needs, preparation of plans, monitoring, record keeping and commodity storage.

More details of the functioning of each program are provided in Annex B. The following sections (4.2, 4.3 and 4.4) compare the characteristics of sampled households, communities and centers participating in the three programs.

4.2 PROGRAM PARTICIPATION

Household interviews showed that 94 percent of the bonos group was enrolled in the program in 1993, prior to the disruption that occurred in early 1994. In 1993 and 1994, the bonos recipients attended an average of 3.5 distributions each. In the six months preceding the interviews, over 70 percent of the households had attended at least 2 bonos distributions. On average each family had 1.5 beneficiaries.

In the PAMI (take-home) program, households were participants on average for 15 months, and at the last distribution, had received 3.4 lbs of rice, 3.3 lbs of beans and 2.7 lbs of corn.

This amount suggests an average of 2 beneficiaries per household. On average each household attended 78 percent of the monthly distributions.

In the PAC (on-site) feeding program, families were participating on average for 17 months, and each family had an average of 2.1 beneficiaries. The centers were providing services on 272 days per year. On average, beneficiaries attended on 75 percent of the days the center was open. The range of foods prepared in 1993 comprised rice, beans, corn soy blend, milk powder, vegetable oil, sugar, wheat and other foods. Some of these ingredients were purchased or donated by beneficiary families or community workers at the centers.

Figure 5 summarizes the annual value of benefits received per household in each MCH program.

4.3 PARTICIPANT CHARACTERISTICS

The characteristics of participants selected at random from each program and a non-program group selected from a comparable rural area, are shown in Table 5. The profiles are typical of low income rural households in Honduras.

All four groups were similar with respect to number of persons in the family (6.7 ± 2.6), number of women of reproductive age in the family (1.5 ± 0.9), number of children below 5 years of age (1.7 ± 0.8), education of the fathers and mothers (both around 2.4 years), electricity in the home (12%), and proportion with cultivable land over 5 manzanas (2.8%). There were significant differences ($p \leq 0.05$) in the ownership of possessions such as radio, television, bicycles, cars and animals, with bonos recipients lower on each indicator. There were significant differences in the proportion of female headed households, although in all cases this varied from 10 percent to 16 percent. An estimated ten percent of the households

participated in other programs. In addition, approximately 27 percent of all households received bonos from primary schools, but only 5.3 percent of households receiving the bonos from health centers (BMI), also received school bonos (BMJF). According to government policy, the two bonos programs were implemented in separate geographic areas to minimize dual program participation.

Household characteristics were used as control variables to estimate the net impact of the programs. This is described in more detail in Annex A and in the results section below.

4.4 COMMUNITY AND CENTER CHARACTERISTICS

As shown in Table 6, all communities in the study were remote and in under-developed areas. The nearest health facilities were an hour to two hours away. In the health center-based programs over (PAMI and bonos) half were accessible only on foot. Paved roads reached communities where only 10 percent of the households were located. Half the communities had piped water and 13 percent were electrified. In over a third, pit latrines were the common waste disposal method.

The proportion of health centers which were CESAMOs was larger in the bonos group than in the other groups (17/20 versus 3/20 for PAMI and 2/20 for no program group). The population served by an individual CESAMO is approximately twice as large as that served by a CESAR, and CESAMOs are staffed by doctors, as compared with only nurses and auxiliaries at CESARs. On average, each CESAMO in the sample served 6,500 persons, and each CESAR serviced approximately 3,500 persons in the designated catchment area. On average, there was with one doctor or nurse per 2,000 persons. More than sixty percent of both types of health centers were constructed over 20 years ago.

During the past few years, primary health care services have evolved to provide comprehensive preventive care when a child or mother visits. There are no fixed days for only immunizations or only growth monitoring etc. Annex C provides more details of the functioning of the health centers and results of the impact analysis for health services utilization.

5. RESULTS: COVERAGE AND TARGETING

Key concerns in cash transfer programs - whether in the form of food or cash - relate to whether the benefits actually reach the neediest segments of the population, and if they do, whether programs cover a meaningful proportion of the groups in need (Grosh 1994, Subbarao, Braithewaite and Jalan, 1995). In Honduras, bonos and food programs are designed to fill income and food availability gaps, and to encourage greater participation in primary education and preventive health services. The implicit assumption is that certain segments of the population do not achieve satisfactory consumption levels for key goods and services which contribute to health and well-being, and inadequate consumption pushes them farther away from breaking down the barriers to full economic participation. These

programs are largely funded by public resources - though the food programs have a significant private share (see Fiedler 1995 for MCH programs and Phillips ET AL 1995 for school-based transfer programs). Assuring that the benefits reach the most disadvantaged is a high priority, both to reducing the need for such programs in the future and to ensure the best use of scarce public funds.

The distribution of beneficiaries of each program across income quartiles provides an indication of who enjoys the benefits of the programs. Since child nutritional status is an excellent combined indicator of well-being and productive capability of individuals, households and communities and is determined by a variety of key household and community characteristics, and the programs often employ this indicator for targeting purposes, child nutritional status among the program groups is also examined in this report. Coverage achieved by the programs included in this study is compared with coverage by other public services. Coverage is defined as the proportion of households in the country participating in the transfer programs or receiving the benefits of public services.

To explore these issues, we used two data bases:

1. National household survey - Estudio de Indicadores Socioeconomicos - of 1993-94, to examine on a national level, who the beneficiaries of the different programs are. This survey was conducted on 2700 households, selected randomly from all households grouped into three rural and three urban strata, and includes data on current program participation as well as nutritional status of children, expenditures, education/schooling, and food consumption (household, not individual).
2. The cost-effectiveness MCH study surveys were located in the rural, Western half of the country. An area-based representative sample was not used to select households. A random sample of approximately 350 participant households were identified from each MCH program, and 350 with no program.

The results are presented under the following sections:

- 5.1 Coverage
- 5.2 Targeting by household characteristics
- 5.3 Targeting by child nutritional status

5.1 COVERAGE

We first explore a hypothetical scenario in which there is no program overlap among MCH programs and targeting is perfect in terms of reaching only those below the poverty line or only malnourished children. This shows that relative to the magnitude of the problems of poverty and childhood malnutrition, the three MCH programs taken together cover a small proportion of households and children. In 1993 all three programs combined reached 213,500 children and women, assuming no overlap. For example, assuming 2 beneficiaries per household (from our household survey), this means there are 106,750 (213,405/2)

households covered by the program. According to the 1993/94 household survey of expenditures and nutrition, this figure represents less than 15 percent of all households below the poverty line nationally. Similarly, if 2/3 of the beneficiaries are children under five, 143,000 children would be covered by the programs (213,500*.67), and this represents less than 20 percent of all stunted children and less than 40 percent of all underweight children in the country.

Data on program participation of the MCH and school programs, from the national household survey of 1993/94, are presented in Figure 6. Sixty-four percent of all households in the country did not participate in any MCH or school programs. Households that received only food rations from health centers (from CARE or World Food Program) consisted of 2.6 percent of households nationally, but an additional 1.7 percent received food rations from health centers in addition to participating in another program. The BMI-only households comprised 2 percent of households nationwide, and an additional 2.8 percent received BMI bonos and participated in other programs. In all, taking into account program overlap, less than ten percent of households nationally, participated in one or more MCH program.

National household survey data from 1993/94 in Figure 7 allows us to compare the national coverage of MCH and school-based food and bonos programs with coverage of public services in Honduras.

Health infrastructure, as measured by access to piped water, latrines and to a health center/hospital within one hour from the home, appears to have achieved the highest coverage of all the services compared, with 70 to 75 percent of all households nationwide provided access. Around 60 percent of even the lowest quartile enjoyed access to these services. Nationally, electricity achieved the next best coverage with almost half the households having electricity in their homes; however, only 16 percent of the lowest quartile had electricity. This is partly due to the fact that the poor are disproportionately rural. The merienda escolar (school feeding) program has an impressive coverage of around 30 percent, and almost one-half the lowest quartile of households participate in the program. Both bonos programs combined reached only 15 percent of the national population in 1993, although a third of the households in the lowest quartile were participating. The coverage of the MCH food programs reach an insignificant proportion of the national population or any income quartile.

5.2 TARGETING BY HOUSEHOLD CHARACTERISTICS

The bonos and food programs are successfully targeted, and reach poor households more frequently than higher income households, unlike the distribution of public services such as electricity, education and health care. In particular, electricity and education are skewed towards benefiting the upper quartiles more than the lower quartiles. Health infrastructure is equitably distributed across income groups, with only a slight tendency to favor the economically better-off. Among the transfer programs, bonos programs are better targeted

than MCH food programs, and merienda escolar is intermediate between bonos and MCH food programs. Between the two delivery systems for bonos, the school-based program is better targeted than the health center-based program. The merienda escolar program is well-targeted - better than the health-center based bonos program.

In Table 5, similar information was provided for the households in the study areas located in rural Western Honduras. Differences across study groups are less striking, as the selection of all groups was limited by design to poor areas. Nevertheless, annual expenditures per adult equivalent were lowest in the bonos households, and this group had the lowest proportion of households with possessions such as radio, television, bicycle, animals, and refrigerator ($p < 0.05$).

When the study households were allocated to expenditure quartiles based on national expenditure levels (developed from the 1993/94 household survey), the bonos group had relatively more households in the lowest two quartiles (58 percent), followed by the PAMI group (54 percent), PAC (52 percent) and the no program group (48 percent).

5.3 TARGETING BY CHILD NUTRITIONAL STATUS

The cross-sectional nature of the study design makes it difficult to draw definitive conclusions regarding targeting based on nutritional status, because the impact of program participation on nutritional status may confound the success of program targeting. This is of particular concern for the lactarios program, which provides intensive feeding for the most malnourished children. With this caveat in mind, the results are nevertheless indicative of the relative success of targeting.

Table 8, based on the national household survey of 1993/94, shows the proportion of malnourished children in the bonos versus non-bonos groups. The data suggest that nationally and in urban areas in particular, the bonos program is targeted to households with malnourished children. There is still potential to improve targeting further, however.

Table 9 summarizes data from the MCH study conducted in rural Western Honduras, in which three indicators of nutritional status were measured: height, weight, and weight to height ratios. All indicators showed that the bonos and food programs had successfully targeted their programs to the relatively more malnourished. This is consistent with the results of the targeting analyses when household income is used as an indicator, in section 5.1 above. The proportion of children falling below -2 Z scores in the bonos group was significantly greater than the other groups, and the food programs were intermediate between bonos and no program children for height and weight measures ($p < 0.05$). The bonos (BMI) program appears to be reaching more households with malnourished children. It is important to note that the better nutritional status in the food programs may be related to program impacts.

Relative to national prevalence data from 1993/94 (Estudio de Indicadores Socioeconomicos), the MCH study population showed slightly higher levels of short-term nutritional deficits based on more children with low weight/age (27 vs 21 percent) and weight/height (19 vs 14 percent). Among program groups, children in households receiving the bonos were significantly more malnourished in terms of stunting and underweight. This appears to be an indication of good targeting accomplished by the bonos program. The age and sex differences in the combined groups showed that the age group of 12 to 36 months had highest levels of deficits especially in weight/age and weight/height compared with children under 12 months of age or over 36 months. Height deficits persisted in older age groups studied, however, and over half of all children were stunted through 60 months of age¹.

Results of the multivariate analysis are as follows:

Program Participation: In the combined models (ages 6 to 35 months), with all program participants and non-participants included, bonos and PAMI participation was associated with significantly lower weight for age ($p \leq 0.05$) and marginally with lower weight for height ($p \leq .09$). The reverse was true of the PAC program, where, the associations were positive. This suggests that either the PAC program was targeted only at the household level and not to malnourished children within households, or the program had significant positive impacts on nutritional status.

When program groups were separated and the duration of participation within each program was the exposure variable used, there was no consistent pattern of associations between nutritional status of children and program participation.

Other Factors Associated With Nutritional Status: For all three nutritional status indices, household income and sometimes the possessions index was positively associated with better nutritional status. All three indices of nutritional status showed a decline with the child's age. Other important factors in assuring good nutritional status, though not as consistently associated with all indices include: presence of a good waste disposal system, young age of mothers, nearness to the food market, distance from health center, and concentration of health services in the community.

The analysis shows that bonos and PAMI program participants had higher malnutrition levels than PAC or the no-program group of children, indicating that these programs had successfully targeted their programs towards the more malnourished children, even after

¹When comparison were made of girls versus boys, within different age groups, some interesting differences emerged. Among the under 12 month age group and 12 to 36 month age groups, more girls were adequately nourished than boys for all indicators of nutritional status. By the fourth and fifth years of life, girls had declined to the nutritional levels of boys and showed equally high levels of stunting and underweight.

controlling for many differences in household and community characteristics and the effects of the programs.

In summary, all food and cash transfer programs are targeted to the relatively more needy segments of the population. This is in marked contrast to the availability of services such as education, electricity and health. Both bonos programs (BMI and BMJF) and merienda escolar (school feeding) are the best targeted of the programs reviewed. Coverage of all transfer programs is low relative to need.

6. RESULTS: IMPACT ON HEALTH SERVICES UTILIZATION

Evaluation of program impacts on health services use and quality are presented in this section for bonos (BMI) and PAMI programs. Increasing utilization of health services is a major objective of both programs. The community-based, on-site feeding program (PAC) is not intended to increase participation at health centers directly, and is not included in this comparison. However, knowledge and practices related to maternal and child health and feeding practices are presented for all three programs. The following components are included in this section:

- 6.1 Number of visits reported for preventive maternal and child health care as an indication of health services utilization; measured through household surveys.
- 6.2 Quality of health services as measured through exit interviews with mothers and observed interactions between clients and providers at CESARs and CESAMOs.
- 6.3 Knowledge and practices of mothers measured through household surveys.

The number of visits data are from a survey of 1076 households, approximately evenly distributed among the three study groups. The bonos participants had attended on average 2.3 bonos distributions in the six months preceding the survey. The lower than expected visits for bonos was mainly due to delayed start up of the bonos program in 1994. Ninety-four percent had been enrolled during 1993 prior to the disruption in the bonos program. The PAMI (rations) group, had attended 3.4 distributions in the previous six months. Some of the participants had been enrolled in the program for less than six months. Approximately 6 percent of all groups also participated in the PAC (on-site feeding) program. The average time taken per visit to the health centers was 4.2 hours for all groups combined, with the bonos group reporting an hour more than the PAMI group. The average distance from the nearest CESAR, CESAMO or hospital was approximately one hour, with the median distance for bonos families twice that of PAMI families (60 mins. vs 30 mins.). Almost 70 percent of communities had 1 to 5 sources of health care within 30 kilometers. Eighty-four or more percent of all households in the study that reported making at least one visit to a health facility for maternal or child health care, used a CESAR or CESAMO.

The study households reported a wide range of monetary expenditures for health. On average, household health expenditures were 2 percent of total annual household expenditures (median annual expenditures = 7400 lempiras). This is below national estimates from the 1993/1994 survey of consumption, income, expenditures, and nutrition, in which health expenditures averaged 3.3 percent for urban and 3.8 percent for rural areas. In the MCH study, expenditures on medicines were four times the expenditures on consultations.

The bonos program group received benefits from CESAMOs significantly more frequently than PAMI group, which received food rations from CESARs predominantly. Using a 15-day recall period, the study found that 22 percent of children under 60 months in all households (n=2429) during the study period of July to December 1994, had diarrhea, and 13 percent had diarrhea accompanied by mucus, bloody stools or vomiting. One-half of those who had diarrhea reported using ORS (litrosol). Thirty-one percent reported experiencing ARI symptoms. Visits to a CESAR or CESAMO for ARI symptoms (32%) was reported by twice as many children as for diarrhea accompanied bloody stools, mucus or vomiting (16%).

6.1 NUMBER OF HEALTH VISITS

The number of household visits for preventive services (such as prenatal and postnatal checkups, vaccinations for children or growth monitoring) is the indicator of health services utilization used to assess program impacts. In this section, we first present results of visits for maternal health, followed by results for children's health services and finally for combined visits for both maternal and child preventive services.

In each household, the mother of the focus child or focus mother herself, was asked to enumerate the number of visits made in the past six months to CESARs and CESAMOs for any of the following services: children's vaccination, growth monitoring, sickness of children, adult illness, prenatal checks, delivery, postpartum checks, family planning, collection of bonos, and collection of food rations. The number of visits for vaccinations and growth monitoring were added together to obtain an indicator of preventive child health visits made, and the number of prenatal, delivery and postpartum care visits were added together to obtain an indicator of maternal health care visits. The denominator for children's visits is the total number of children under five in the household, and for maternal health, the total number of girls/women in the 12 to 60 years age group. A combined indicator for preventive care visits was developed by adding children's and women's health visits, using as denominator the total number of children under five and women (12 to 60 years).

Results showed that during the 6 months preceding the study, a significantly higher proportion of households from the PAMI program group visited health centers for growth monitoring and prenatal checkups ($p \leq 0.05$). For all groups combined, the most common reason for visits to health facilities was sickness of children (66%) followed by vaccinations of children (59%), and growth monitoring (47%). Family planning and post-partum checkups visits during the 6 month period were noted by less than 10 percent of the

households. On average, each household made two visits to a CESAR or CESAMO during the six months for sickness of the child and growth monitoring, and 1.4 to 1.6 visits for vaccinations, prenatal checks and sick adults.

The program exposure variable used is whether or not the household is currently a participant in the rations program (measured as yes or no), and for bonos, whether the household received one, two or three or more bonos in the past 6 months. The bonos program interruption from November 1993 to May 1994 necessitated our investigating the impact of a stable bonos program by measuring the "Bonos3" (at least three visits in the past six months) as a separate category. The rations program has been operating at a stable level and consistently delivering food rations for several years. The magnitude of total program effects attributable to one year's operation of each program is based on "Bonos3" households only and on all current participants in the rations (PAMI) program. Additional exposure variables were constructed to explore the role of the value of benefits received and the duration of participation. Value of benefits was estimated by multiplying the number of beneficiary members of the household by the number of visits in the last six months for rations or bonos. For the PAMI group, this was again multiplied by the lempira value of rations (calculated using prices paid by the household for the type of food commodity received from the program), and for the bonos program it was multiplied by 20 lempiras (value of each bono).

6.1.1 VISITS FOR MATERNAL HEALTH SERVICES

Maternal and neonatal health have emerged as high priority concerns for Honduras, as infant mortality has declined and there is a better understanding of the importance of women's health. The incentive effects of food and bonos programs on ensuring that each woman obtains a minimum level of adequate care are important. The indicator used is the number of visits for prenatal and postnatal care made during the six months preceding the interview.

6.1.1.a Program Effects:

Participation: The PAMI take-home food distribution program has a positive and significant effect on the number of visits to health facilities for preventive maternal health services, controlling for the other variables in the model. See Table 10 (complete model results are shown in Annex C). In each household in the PAMI program (average number of women 1.5 per household), the additional number of visits to a health facility for maternal health services increased by 1.6 visits annually ($1.5 * 1.04$), as compared with households in neither program. The bonos program did not show any significant effect.

Value of Benefits: No significant relationship was found for either bonos or PAMI programs when the exposure variable was the value of food or bonos received from health centers in the past 6 months.

Duration of Participation: Duration of participation in either program did not show any significant relationship with number of preventive visits. However, when value of benefits and number of visits was controlled for, participation in 1993 in the bonos program had a significant negative effect on the number of visits. The visits decreased by 0.8 per woman per year ($p = 0.05$). The negative effect suggests a loss of credibility in the program health centers due to program cessation in 1993/94, which may have led to households making fewer visits.

6.1.1.b Other Factors Affecting Maternal Health Visits - Household Characteristics

Household Size and Composition: The number of pregnant women in the household significantly increased the number of visits ($p = 0.000$) by 2.2 per woman per year. Larger households tend to make fewer visits ($p = 0.08$), although the effect is relatively small.

6.1.1.c Other Factors Affecting Number of Visits - Community Characteristics:

Distance to Urban Area: Households in remote, rural communities make fewer visits ($p = 0.018$), however the magnitude of this impact was not large.

Infrastructure: Four community infrastructure variables were entered in the model, again to control for as many confounders as possible, of the program effect: piped water, electricity, drainage system and access to asphalt roads. In every model tested, one or the other infrastructure variable was found to be highly significant in predicting health services use. For example, in the model using program participation as the exposure variable, availability of piped water in the community increased household visits by 0.68 per year per mother ($p = 0.005$), and having a drainage system increased visits by 1.1 per woman per year ($p = .046$).

6.1.1.d Other Factors Affecting Number of Visits - Health Center Characteristics:

The older the health center, the fewer the number of visits made by the household ($p = 0.07$), though the magnitude of effect is small. Other attributes of centers such as CESAR vs CESAMO, number of rooms, ratio of doctors and nurses to population in the catchment area and the Health Region and Area were not significantly related to participation.

6.1.2 VISITS FOR CHILD HEALTH SERVICES

6.1.2.a Program Effects:

Participation: The PAMI program has large positive and significant effects increasing the number of visits to health facilities for child health services by 1.9 visits per child per year, controlling for the other variables in the model. See Table 11 (complete model results are shown in Appendix C). For each household in the PAMI

program (average number of 1.7 children under five per household), the additional number of visits to a health facility for child health services increased by 3.3 visits annually ($1.7 * 1.9$), as compared with households in neither program. The bonos program did not show any significant effect.

Value of Program Benefits: The PAMI food distribution program showed significant positive effects on the number of visits in the past six months ($p = 0.0006$), when the exposure variable was the value of food received from health centers in the past 6 months. The bonos program showed no effect.

Duration of Participation: The number of months that a household had participated in the program showed no additional effect beyond the value of benefits or frequency of visits in either program.

Frequency of Participation: After controlling for the value of benefits, and duration of participation, the number of visits made for collecting food rations by PAMI households was associated with an increased number of health center visits for child health services ($p = 0.020$). Number of visits per child increased by .45 per year. There was no significant effect of bonos visits.

6.1.2.b Other Factors Affecting Children's Health Visits - Household Characteristics

Household Size: Larger households made fewer visits to health centers for children's preventive care ($p = 0.024$). For each additional person in the household, visits declined by .14 per child per year.

Season: Two indicators of seasonality were tested: the number of rainy months in the past six months and number of food scarcity months in the past six months (based on food prices). "Scarcity months" were significantly and negatively related to number of visits ($p = 0.004$). For each additional food scarce month, the number of visits dropped by 0.81 per year child in the household. "Scarcity" months may have indicated limited availability of time and labor so that time for visits is expensive.

Participation in PAC (lactarios): Households in the PAC program used the health centers less frequently ($p = 0.039$). This may be due to the lactarios providing some health services for children in addition to growth monitoring, reducing the need for the family to visit a health center. Lactario participant visits were 1.26 visits less than non-participants per child per year.

6.1.2.c Other Factors Affecting Number of Visits - Community Characteristics:

Infrastructure: In all children's visits models tested, one or the other infrastructure variable was found to be highly significant in predicting health services use. For example, in the model using program participation as the exposure variable, the

availability of electricity in the community increased household visits by 1.06 per year per child ($p = 0.05$).

6.1.2.d Other Factors Affecting Number of Visits - Health Center Characteristics:

Distance of the health center from the nearest town decreased the number of visits ($p = 0.034$).

The time taken per visit to the health centers was not significantly associated with the number of visits. This may be due to a lack of variability among the households in which the time taken per visits ranged from a median of 3 hours for the no program group to 5 hours for the bonos group. It is also possible that these visits are combined with trips for other purposes so that the time costs are not the true additional time costs.

6.1.3 COMBINED MATERNAL AND CHILD HEALTH VISITS:

6.1.3.a Program Effects:

Participation: The results of the model show that the PAMI program has positive and significant effects on number of visits to health facilities for preventive maternal and child health services, controlling for the other variables in the model. See Table 12 (complete model results are shown in Appendix C). In each household in the PAMI program (average number of women 1.5 per household plus 1.7 children under five per household), the additional number of visits to a health facility for maternal and/or child health services increased by 4.9 visits annually ($1.5 + 1.7 = 3.2 * 1.5$), as compared with households in neither program. The bonos program did not show any significant effect.

Value of Benefits: As the value of rations received in the past 6 months increased in the PAMI program, so did the number of visits ($p = 0.007$). There was no significant effect of the total value of bonos received in the past 6 months.

Duration of Participation: The number of months a household had participated in the program was associated with an increase in the visits by households in the PAMI program of 0.13 visits per child or mother per month of participation ($p = 0.013$), after controlling for value of benefits received. The bonos program showed a significant negative effect of 0.83 fewer visits per child or mother ($p = 0.009$), after controlling for value of bonos received and number of visits. The variable used for bonos duration is whether the household was enrolled in 1993 or not. The negative effect, once again suggests a lack of credibility in the program health centers due to program cessation in 1993/94, which led to a loss of the potential incentive effect and thus to households making fewer visits.

6.1.3.b Other Factors Affecting Health Visits - Household Characteristics:

Household Size and Composition: Larger households tend to make fewer visits ($p < 0.0004$); the effect of one additional member is to reduce visits by .12 per child and mother per year. The number of pregnant women in the household, as expected, increased visits ($p = .001$).

Time Taken per Health Center Visit: Increasing the time taken per visit to the health center decreased number of visits ($p = 0.027$), with .07 fewer visits per child and woman per year for an additional hour of time taken.

Season: "Scarcity months" was significantly and negatively related to number of visits ($p = 0.001$). For each additional food scarce month, the number of visits dropped by 0.5 per year per child and woman in the household.

6.1.3.c Other Factors Affecting Number of Visits - Community Characteristics:

Distance to Urban Area: Households in remote, rural communities make fewer visits ($p = 0.07$). However the magnitude of impact was not large.

Infrastructure: In every model tested, one or the other infrastructure variable was found to be significant in predicting health services use. For example, in the model using program participation as the exposure variable, availability of piped water in the community increased household visits by 0.5 per year per mother and child ($p = 0.012$).

In summary, after controlling for a number of possible confounding factors at the household, community and health center levels, multivariate analysis shows a significant positive effect of participation in the PAMI program on the number of preventive health visits made for both maternal and child health services. The bonos program showed no significant effect. There was an indication of negative effects of program suspension in early 1994. The families that experienced this disruption tended to make fewer visits to health centers for preventive care. Among other factors playing an important role in determining health center use, were: community infrastructure (electricity, piped water), seasonality (food scarcity in the preceding six months), remoteness from urban areas, and household size.

6.2 IMPACT ON HEALTH CENTER QUALITY

The "quality" of health services can be characterized in several ways. For the purpose of this study, a key concern was the impact of the distribution programs on quality of attention given for each visitor to the centers. In attracting a larger volume of visits, it was hypothesized, the quality of services would suffer because there would be less staff time and medicines to serve all visitors. Health center staff expressed these concerns at the initiation of the bonos program, and again during interviews conducted for this study (see Annex B). However, until now there has not been an objective assessment of the relationship between

the programs offered and quality of services. A quality of health services index was developed using results of the satisfaction survey and observed interactions between health center staff and patients. The observed interactions were compared with checklists prepared for each type of patient, and the observer marked off the actions followed or not followed by the provider. Exit interviews asking about patient satisfaction were conducted over a period of approximately four days per center, and were limited to visitors for: sick child visits, well-baby visits, prenatal, postnatal and family planning services.

The index is an average of the % scores for client satisfaction (waiting time < median, satisfied or very satisfied, if she would recommend the health center to a friend, if health center staff were easily understood); and for each of the following observed interactions: diarrhea, ARI, prenatal, growth monitoring, family planning - all weighted equally.

The results of the client satisfaction assessment revealed that on three of the four components analyzed (waiting time less than median, would recommend center to someone else, and health care worker was easy to understand), the scores were significantly different among the groups, and the no program group had better scores. This suggests that the programs do appear to reduce the quality of each visit from the client's perspective.

The results of the observations of interactions between providers and patients for each type of visit showed that overall, more than half the desired checklist items (actions that the health center staff should have taken) were followed, as seen in the summary Table 13. See Annex C for details. A number of areas for strengthening case management of diarrhea patients were identified, chiefly the provision of education regarding infant feeding. An important item - whether the degree of dehydration was diagnosed and recorded - was omitted from this study, and should be added in future assessments. In growth monitoring, failure to undress the child, lack of child feeding education, and not conducting a dialogue with the mothers, are problems which signal areas for strengthening. Not teaching children's caretakers to observe risk signs of ARI were lacking in many cases; these are weaknesses in ARI case management. Three clear weaknesses in prenatal care were identified: family planning counselling, screening for clinical signs of anemia, and examination of breasts for breastfeeding mothers. Because of the few cases of family planning visits observed, it is difficult to conclude anything definitive. As seen in the summary Table 13, there are specific areas for improvement in all cases. In general, prenatal checks and growth monitoring appear to be performing closer to norms than diarrhea and ARI case management.

With respect to program groups, the bonos and PAMI program centers appear to be consistently performing better than the no program groups in preventive care and case management services that were measured in the study. PAMI centers had the highest scores consistently. However the differences across study groups were not statistically significant.

The increased volume of visits resulting from the incentive programs does not appear to be reducing the quality of services overall, although the clients in the non-program centers expressed greater satisfaction. To demonstrate the impact of the quality factor, the number of visits estimated in section 6.1 were adjusted for quality by multiplying each additional visit by the quality score of the center.

The models assessing the impact of program participation on health services use were re-run using the quality-adjusted visits, and the results were found to be similar to the previous results. The PAMI food distribution program was significantly more effective in the additional use of health services (quality-adjusted); as we noted above, bonos participants did not demonstrate any increased use of preventive health services. When the additional visits obtained in section 6.1 above were adjusted based on the difference in quality between each program and non-program group, the result of adjusting for quality was to increase the number of additional visits attributed to the PAMI program because the quality index was highest for the PAMI health centers. Table 14 summarizes the key findings from this analysis.

In summary, we found no evidence of a negative effect of either the bonos program or the PAMI program on quality of services. The observed interactions for case management and preventive care at each health center suggests that more desired actions were consistently being taken in the bonos, and particularly in the PAMI health centers, than in non-program centers, indicating better quality at the health centers with programs. This may be an effect of greater supervision from higher authorities in the PAMI and BMI programs or demand for better quality services from a better informed client population. In general, the quality scores suggest a need for improvements in actions taken by health care providers. On the other hand, client satisfaction was generally high across all groups. However, among program groups, satisfaction scores varied by program, and were consistently lower in both program groups.

6.3 KNOWLEDGE AND PRACTICES OF MOTHERS

As shown in the conceptual framework, an important step in the pathway of desired impacts of all three MCH programs on the health and nutrition of program participants is changes in their knowledge and practices related to maternal and child health and nutrition. All three programs: bonos and food distributed through health centers, and the daily feeding program at community-based nutrition centers are expected to provide nutrition education to women who bring their children or collect bonos or food. Conditions for participation in the health-center based programs include compliance with health norms (such as vaccinating children, bringing them for growth monitoring and attending prenatal checkups). In this section we examine the differences among study groups in mothers' knowledge regarding key messages related to child health and feeding, and practices (self-reported) regarding compliance with health norms.

Maternal and child health related knowledge and practices of mothers were assessed by administering a series of questions to focus mothers in the households. When a focus mother was not present another mother (pregnant, lactating or having a child under five years of age) was selected. The questions on knowledge were asked first, and were phrased in terms of "in your opinion, what should be done if..." or "what should you do if..."; investigators were trained not to prompt responses by reading the coding options. Questions regarding what she actually did were asked later, in terms of "what did you do..." during her last pregnancy (for prenatal and postnatal care) or for the youngest child (for child health practices). **Annex C.5 contains tables with responses to these questions.** A subset of the most key questions related to practices (actions taken regarding specific health care situations), and knowledge (what she believes should be done for specific maternal and child health and feeding decisions) are discussed below.

Table 15 summarizes the results of mothers responses to ten key knowledge questions. On four of the ten questions, the responses were significantly different across groups: three were on desirable feeding practices related to children who have diarrhea, and one on how often a newborn should be taken to a doctor or health center. In two of these, the PAMI group had the most frequent correct answers, in one it was the lactario group and in one, the bonos group. The most frequently missed responses were: how to increase breastmilk supply (1.1% correct responses), when to take the newborn for its first health checkup (5.3% correct responses), and increasing the quantity of food after a child has diarrhea (18.8% correct responses). Also needing improvement were: feeding a child frequently when it has diarrhea (51.3%), correct age at which feeding liquids other than breastmilk should be started (51.6%), and continuation of breastfeeding during diarrhea (64.4%). All study groups tended to miss the same questions.

Table 16 contains the results of responses of mothers to twelve key questions regarding maternal and child health practices. On six of the 12 questions, the proportions responding correctly were significantly different across program groups. In all but one (where the lactarios group had more correct responses), the PAMI had more correct responses. In general, all groups tended to get low scores on the same questions. The fewest correct responses were for: visit a health center if the child had diarrhea with mucus, bloody stools or vomiting (4.2%); visit a health center if the child has symptoms of ARI (7.1%), age at which newborn should be taken for its first checkup (10.8%); use of litrosol when the child has diarrhea (15.5%); and number of days postpartum at which a check up should be conducted (16.1%). Overall, fewer women answered correctly on practices than knowledge (37% versus 59% respectively).

The answers to practices and knowledge questions were summarized in an average KAP score which is the average number of correct answers per group. These were .46 (± 11) for the no program group, and .48 (± 12), .49 (± 11) and .50 (± 10) for the bonos, PAC and PAMI groups respectively. Using multivariate analysis to control for differences in mother's, household and community characteristics, the impact of program participation on average KAP scores was analyzed. The results are summarized in Table 17. Two of the

three programs - bonos and PAMI show significant positive effects. The PAC (lactarios) program did not show any significant effect. Among other factors playing an important role in determining mothers' knowledge and practices were: age of the mother (the younger the better the score), whether she was pregnant (negative effect), size of the community (the larger the better), distance of the community from an urban area (scores declined with distance), infrastructure (improved score), distance of the health center from urban area (lowered the score).

In summary, PAMI and bonos programs showed evidence of improving the mothers' knowledge/awareness and self-reported practices concerning maternal and child health and feeding. The results are reassuring in that although bonos program participants did not demonstrate increased health center visits, the first step in the pathway to improved utilization appears to have improved. The disturbing finding is that the vast majority of mothers from all groups are not aware of the most critical maternal health and child survival actions that they need to take. The improvements attributable to programs were significant statistically, but small in relation to desired objectives.

7. RESULTS: IMPACT ON FOOD CONSUMPTION

An important objective of all three programs - bonos, PAMI and PAC is protecting poor households from food insecurity (defined as not having access to adequate food to meet nutritional needs). In addition to household-wide benefits, the programs also target individuals within families, pregnant and lactating women, and children under the age of 5 (BMI and PAMI) or 6 years (PAC) at risk of malnutrition.

The bonos and take-home food distribution from health centers provide benefits for entire households but nutrition education and growth monitoring activities are expected to help divert more food resources to these high risk individuals. The PAC (lactarios) program conducts supervised feeding for mothers and children in the community. Ingredients used in this program are: rice, beans, corn-soy-blend, milk powder and vegetable oil. The community provides other ingredients such as sugar and condiments, fruits and vegetables, and others. The mean number of days that centers reported being open was 272 (median 306) days per year. In PAMI, the type of take home food includes rice, beans and corn. The families reported on average 5 members of the family sharing this food, which lasts approximately 2 weeks. Distribution is monthly.

The estimated duration of participation varied from 15 to 17 months per household for the food programs (PAMI and PAC programs respectively) to less than 12 months for bonos households; 94 percent of the bonos households had participated in the bonos program in 1993. A key question in this analysis is whether the additional resources provided to each household resulted in net improvements in food consumption, given the two forms of transfer (food and cash), alternate modes of food distribution (monthly take-home rations in PAMI versus daily feeding in PAC), and two different mixes of foods provided by PAMI and PAC. Differential impacts on households and individuals (mothers and children) are examined.

For estimating dietary intakes of households, three, non-consecutive 24-hour dietary recalls were conducted on each household in the sample. The sample consisted of 360 bonos recipient households randomly selected from health centers in the bonos program, 358 food ration recipient households randomly selected from health centers in the PAMI program, 338 households of lactarios participants randomly selected from lactarios in the PAC program, and 358 households randomly selected from households with children under five years of age from health centers not participating in any of the aforementioned programs. The 24-hour recall data included all food prepared in the household and consumed the previous day. Volumes or weights of cooked foods and ingredients were recorded and converted into grams per day. The calorie and protein values were calculated from Latin American food composition tables (INCAP), and averaged for the three days. Meals consumed by family members outside the home were imputed based on average consumption per adult equivalent, of members consuming that meal in the household.

For estimating dietary intakes of mothers and children, individual portion sizes consumed were obtained from three non-consecutive 24-hour recalls in each household, for one mother (pregnant, lactating, or having a child under five years of age) and two children (0 to 11 years of age). The food consumed at lactarios and schools was estimated from data obtained on recipes and volumes distributed per person from lactarios. Food composition tables used for converting commodities into calories, protein and vitamin A are from the Commodities Reference Guide (USAID/FFP).

Data on the adequacy of food consumption by program group is shown in Table 18. More detailed tables are in Annex D.1. On average, calorie consumption was 2860 ± 1020 per adult equivalent per day (compared with a recommended level of 2800 per AE/day). However, this average masks important disparities among groups of households and within households. An estimated 30 percent of households did not consume even 80 percent of the recommended caloric level. Individual dietary intake data showed that pregnant women's food consumption is especially poor. Protein consumption averaged 64 grams ± 26 per AE/day, well above adequate levels. Average vitamin A consumption was extremely low, only 24 percent of recommended levels, and even lower among pregnant and lactating women. Calorie and protein intakes were highly correlated, but vitamin A intake was neither correlated with calories nor protein intakes.

To determine the net impact of programs, differences in the characteristics of families, communities and health centers/lactarios was controlled for through multivariate analysis. The following groups of variables were used as controls in all dietary intake models: household size and composition; education of the female and male heads of the household, and father and mother of young children; income and wealth indicators; season in which the measurements were made; rainfall and food scarcity in the preceding six months; participation in other programs; infrastructure indicators of the communities; center characteristics. The children's and mothers models also include the child's and mother's ages, child's sex, and the pregnant/lactating status of the mother. The program exposure variable used is whether or not the household is currently a participant in the rations

program, or current participant in the lactarios program, and for bonos, whether the household received one, two or three or more bonos in the past 6 months. The bonos program interruption from November 1993 to May 1994 necessitated our investigating the impact of a stable bonos program by measuring the "Bonos3" (at least three visits in the past six months) as a separate category. The PAMI and PAC programs have been operating at a stable level and consistently delivering food rations for several years. The magnitude of program effects per household, attributable to one year's operation of each program is based on "Bonos3" households and all current participants in the PAMI and PAC programs. **Results of regression models are in Annex D.2.**

The following results are reported in this section:

7.1 Household food consumption in calories per adult equivalent (AE) and protein in grams per AE per day.

7.2 Women's food consumption in percent adequacy of calories consumed, adequacy of protein, and of vitamin A.

7.3 Children's food consumption in percent adequacy of calories consumed, adequacy of protein, and of vitamin A.

7.1 HOUSEHOLD FOOD CONSUMPTION

Characteristics of the households by program group were summarized in Table 5.

The PAMI group had higher intakes of calories, protein and vitamin A, though differences were not statistically significant. More households in the PAMI group consumed at least 80 percent and at least 70 percent of recommended levels for calories; and the differences were statistically significant at the 0.05 confidence level.

7.1.1 Household Calorie Consumption

The outcome variable is the average daily intake of calories per adult equivalent (AE) in the household.

7.1.1.a Program Effects:

Participation: The results of the analysis show that the PAMI (take-home) and PAC programs has positive and significant effects on caloric consumption, controlling for the other variables in the model. See Table 18 (complete model results are shown in Appendix D). Each household in the PAMI or PAC, was consuming approximately 250 to 350 calories per AE, than the no program group, after taking into account the household and community differences among the groups. The bonos program showed no significant difference from the no program group at the 0.05 confidence level.

7.1.1.b Other Factors Affecting Household Calorie Intake

Income: A number of variables related to household income were included in the models to control for possible differences in household characteristics among program groups, such as type of flooring, piped water, electricity, amount of land owned, ownership of possessions etc. The variable that made a significant difference was annual expenditures ($p < .005$). The magnitude of the coefficient was small (46 calories/AE per 1000 additional lempiras/year); possibly the presence of other variables capturing income differences (such as water, electricity, flooring, possessions index, radio, education, land owned) reduced the apparent magnitude of the effect.

Household Size and Composition: Larger households tend to consume fewer calories ($p = .011$), and the magnitude of the effect was to lower calories by 39 per AE. If the household was headed by a woman, calorie consumption reduced by 350 per AE ($p = .021$). This phenomenon has been reported earlier by Rogers (1994) for the Dominican Republic.

Season: Two indicators of seasonality were tested: number of rainy months in the past six months and number of food scarcity months in the past six months (based on food prices). A second scarcity variable was based on a question to household members regarding their perception of whether the community was currently in food scarcity. "Scarcity" was significantly and negatively related to number of calories consumed ($p = .003$), calories per AE were lower by 223. The number of rainy months in the preceding 6 months was associated with increased consumption. In 1994, delayed and inadequate rains throughout Honduras led to significant reduction in agricultural production and food/employment shortages. Household food consumption appears to have been affected significantly as well, and for every additional rainy month during the 6 months preceding the interviews, calorie consumption increased by 164 per AE ($p = .043$).

Distance from Food Market: There appears to be a small but significant negative effect of distance of the weekly food market from the community in which the household is located ($p = .006$).

7.1.2 Household protein consumption

The outcome variable is the average daily intake of protein per adult equivalent (AE) in the household. It is expected that the results would be similar to the calorie models, as the common calorie sources (cereals and legumes) are also the common protein sources and any change in food intake or calories is likely to be accompanied by changes in protein intake. In general, the results are similar to those of the calorie models; however, the PAC did not show a significant effect on protein consumption.

7.1.2.a Program Effects:

Participation: The PAMI ration distribution program has positive and significant effects on protein consumption, controlling for the other variables in the model. See Table 19 (complete model results are shown in Appendix D). Each household in the PAMI program was consuming approximately 8 grams more of protein per AE than the no program group, after taking into account the household and community differences among the groups. The bonos and lactarios programs showed no significant difference from the no program group at the .05 confidence level.

7.1.2.b Other Factors Affecting Household Protein Intake

Income: Protein intake improved with income as measured by annual expenditures ($p = .0001$). The magnitude of the coefficient is small; possibly the presence of other variables capturing income differences (such as water, electricity, flooring, possessions index, radio, education, land owned) reduced the apparent magnitude of the effect.

Household Size and Composition: If the household was headed by a woman, protein consumption was reduced by 8.8 grams per AE ($p = .025$).

Season: "Scarcity" was significantly and negatively related to grams of protein consumed ($p = .000$), protein was 6.7 grams per AE lower than if the household did not identify the current period as one of food scarcity for the community. The number of rainy months in the preceding 6 months increased consumption by 4.2 grams per AE per additional rainy month ($p < .05$).

7.2 WOMEN'S FOOD CONSUMPTION

Assuring the adequacy of dietary intakes of women of reproductive age is a high priority and an expected outcome of the programs, not only because maternal nutrition is closely related to child survival and growth, but because women's productivity - influenced by nutrition - is an important development resource. Results of analysis reported here indicate that women's intakes of calories and protein paralleled household level dietary intakes.

7.2.1 Women's Calorie Consumption

The outcome variable is the adequacy of daily intake of calories of women, expressed as a percent of recommended levels.

7.2.1.a Program Effects:

Participation: The PAC program had positive and significant effects on calorie consumption of women relative to their recommended levels of intake, after taking

into account other individual, household, and community differences in the study groups. See Table 20 (complete model results are shown in Appendix D). The magnitude of the effect was in the range of approximately an additional 15.7 percent of adequacy. The bonos and PAMI programs showed no significant difference from the no program group.

7.2.1.b Other Factors Affecting Women's Caloric Intake

Pregnancy and Lactation: Pregnant and lactating women were consuming significantly fewer calories relative to their needs, -23 percent and -14 percent respectively, as compared with non-pregnant or non-lactating women respectively ($p < .0001$). This undoubtedly is due to the failure of household members, including the women themselves to recognize the additional nutritional needs imposed by pregnancy and lactation.

Income: As measured by household expenditures, increase in income accompanied increased caloric adequacy in women ($p = .043$).

Season: "Scarcity" was significantly and negatively related to calories consumed ($p = .061$), and adequacy for calories was 6 percent lower than if the household did not identify the current period as one of food scarcity for the community.

7.2.2 Women's Protein Consumption

The outcome variable is the adequacy of daily intake of protein of women, expressed as a percent of recommended levels.

7.2.2.a Program Effects:

Participation: The PAC program has a positive and significant effect on protein consumption of women relative to their recommended levels of intake, after taking into account other individual, household, and community differences in the study groups. See Table 21 (complete model results are shown in Appendix D). The bonos and PAMI groups showed no significant effects.

7.2.2.b Other Factors Affecting Women's Protein Intake

Pregnancy and Lactation: Pregnant and lactating women were consuming significantly less adequate levels of protein relative to their needs, -22 percent and -25 percent respectively, as compared with non-pregnant or non-lactating women respectively ($p < .0001$). As with calories, this may reflect a lack of recognition by households and women themselves of the elevated needs of pregnancy and lactation.

Income: As measured by household expenditures, increase in income accompanied increased protein adequacy in women ($p = .011$).

Season: "Scarcity" was significantly and negatively related to protein consumed ($p = .001$), and adequacy of protein intakes was 12 percent lower than if the household did not identify the current period as one of food scarcity for the community.

7.2.3 Women's Vitamin A Consumption

Vitamin A consumed by women was extremely low. The outcome variable is the adequacy of daily intake of vitamin A of women, expressed as a percent of recommended levels.

7.2.3.a Program Effects:

Participation: no program effects were found. See Table 22 (complete model results are shown in Appendix D).

7.2.3.b Other Factors Affecting Women's Vitamin A Intake

Lactation: Lactating women were consuming significantly less adequate levels of vitamin A relative to their needs, -9 percent, as compared with non-lactating women respectively ($p < .0001$).

Income: Women's vitamin A intakes improved with income as measured by annual expenditures ($p = .008$).

Education: Education of the male head of household improved vitamin A consumption ($p = .04$), by 2.6 percentage points per additional year of schooling.

Season: "Scarcity months" was significantly and negatively related to vitamin A consumed ($p = .028$), and adequacy of vitamin A intakes was 5.9 percent lower per additional month of scarcity.

7.3 CHILDREN'S FOOD CONSUMPTION

The importance of improving food consumption in this age group cannot be over-emphasized, and the bonos and food programs are the only large-scale approaches currently available to address this problem. Honduras has one of the most severe problems of child malnutrition in the hemisphere, and the intention of the transfer programs being evaluated here is to prevent child malnutrition through improving dietary intakes and reducing the burden of disease in this age group. Dietary intakes (rather than height and weight status) are likely to be the most sensitive indicator of whether the programs are having an impact on child nutrition. Given the cross-sectional design of this evaluation, nutritional status estimates across study groups are not likely to be helpful in answering the question of

program impacts, since baseline levels were not available for comparison with current levels and all three programs actively enlist the malnourished children in the program, making it difficult to interpret differences across program and non-program groups. Children in the program groups start out with more malnutrition than children in the non-program groups.

The sample of children on which dietary data were collected consist of at least one child under the age of five years in each household (randomly selected from each group of program participants), plus another child from the same household randomly selected from all other children in the age group of 0 to 9 years. All children under the age of 60 months were included in this analysis.

Children's caloric, protein and vitamin A adequacy (intakes relative to recommended levels for each child's age and sex) are examined in relation to the participation of their family in each program. The child himself or herself is not necessarily the program enrollee, although the vast majority of the children are themselves enrolled the programs.

As noted earlier, the estimates of dietary intake are based on three-day averages of 24-hour recalls by the child's mother or his/her female caretaker. Central American food composition tables were used to convert amounts of ingredients into calories, protein and vitamin A. Recent data on vitamin A content (retinol equivalents) of Honduran fruits and vegetables were substituted wherever they were available (INCAP, PAHO/Honduras).

7.3.1 Children's Calorie Consumption

The outcome variable is the adequacy of daily intake of calories of children, expressed as a percent of recommended levels.

7.3.1.a Program Effects:

Participation: The food programs have positive and significant effects on calorie consumption of children relative to their recommended levels of intake, after taking into account other individual, household, and community differences in the study groups. See Table 23 (complete model results are shown in Appendix D).

The magnitude of the effect was in the range of approximately an increase in adequacy of 12.4 percent for the PAMI group, and approximately 13.4 percent for the PAC group as compared with the no program group, after taking into account the household and community differences among the groups. The bonos program showed no significant difference from the no program group. Since the programs were placed where malnutrition and poverty problems were greatest, these estimates may understate the program effects. That is, without the programs, the program groups may have been worse than the no program group.

7.3.1.b Other Factors Affecting Children's Caloric Intake

Diarrhea: The presence of diarrhea in the preceding 15 days was associated with lower caloric adequacy ($p = .0031$), and the magnitude of the effect was -7 percent of recommended levels.

Piped Water: Presence of piped water in the home was associated with 8 percent more calories in relation to recommended levels ($p = 0.005$).

Season: The number of rainy months in the past 6 months reduced caloric consumption by 7 percent in children significantly ($p \leq .013$).

Other factors associated with low caloric intakes were distance of the community from the nearest urban area, and distance of the home from the weekly food market.

7.3.2 Children's Protein Consumption

The outcome variable is the adequacy of daily intake of protein of children, expressed as a percent of recommended levels.

7.3.2.a Program Effects:

Participation: Unlike previous results reported thus far, a significant (marginal) positive impact of the bonos program can be observed on the adequacy of protein consumed by young children ($p = .068$). The impacts of the food programs are also positive and highly significant. The PAC program is associated with an increase in adequacy of 21 percent ($p = .0006$) and the PAMI program is associated with a 14 percent increase ($p = .002$) as shown in Table 24. The complete model results are shown in Appendix D. Again, these are underestimates of the true program effects if the programs were placed where protein deficiencies would have been greater than in no program areas in the absence of the programs.

7.3.2.b Other Factors Affecting Children's Protein Intake

Age: Older children were consuming significantly more adequate levels of protein relative to their needs as compared with younger children ($p = .0001$).

Diarrhea: The presence of diarrhea in the preceding 15 days was associated with lower protein adequacy ($p = .005$), and the magnitude of the effect was -9 percent of recommended levels.

Income: Children's protein intakes improved with income as measured by annual expenditures ($p = .012$).

Season: "Scarcity" was significantly and negatively related to protein consumed ($p < .001$), and adequacy of protein intakes was 12 percent lower than if the household did not identify the current period as one of food scarcity for the community. The number of rainy months in the past 6 months reduced protein intakes by 12 percent ($p = .004$).

Other factors associated with low protein intakes were distance to the weekly food market.

7.3.3 Children's Vitamin A Consumption

In general, vitamin A consumed by households and individuals was extremely low. The outcome variable is the adequacy of daily intake of vitamin A of children, expressed as a percent of recommended levels.

7.3.3.a Program Effects:

Participation: The PAC program has a positive and significant ($p = .021$) effect on vitamin A consumption of children relative to their recommended levels of intake. The PAMI program improved intakes and the effect was also significant ($p = .043$). The bonos program had no significant effect. Once again, these may be underestimates of the program effects. See Table 25 (complete model results are shown in Appendix D).

7.3.3.b Other Factors Affecting Children's Vitamin A Intake

Age: Older children were consuming significantly lower levels of vitamin A relative to their needs by -11 percent ($p = .000$).

Education: Number of years of education of the male head of household was significantly associated with adequacy of vitamin A ($p = .036$).

Season: "Scarcity months" were significantly and negatively related to adequacy of vitamin A consumed ($p = .024$), vitamin A was 7 percent lower per additional scarcity month.

Other factors associated with low vitamin A intakes were distance of the health center from the nearest urban area, no electricity and no piped water.

The study also analyzed the dietary impacts of each MCH program on children above five years of age. Results showed a highly significant positive effect of the PAC program ($p = .0008$) of 20 percent increase in adequacy, and a marginally significant impact of the PAMI program ($p = .097$) of a 9 percent increment in caloric adequacy. The BMI program showed no effect. Participation in PAC increased protein intakes by 30 percent ($p = .0000$), and

vitamin A by 22 percent ($p = .0001$). PAMI and BMI had no significant effects on either protein or vitamin A adequacy. The results confirm other study observations that older children participate in significant ways in the PAC program.

In summary, the study found that diets of poor rural households in Honduras contain adequate amounts of protein (although protein quality may be poor), but there is a problem of inadequate calories and a very extreme shortage of vitamin A. The food programs had significant positive effects on improving calorie, protein and vitamin A consumption. The bonos program showed an effect on protein intakes of children. Vitamin A intakes still remained at very low levels, however.

8. DISCUSSION AND CONCLUSIONS

The three programs evaluated in this report, share a common goal: improving household, and maternal and child health and nutrition (in addition, the BMI program is a cash transfer for households to compensate for poverty). They are different in important ways that have a bearing on effectiveness. For example, the health center-based programs have the advantage of providing health services, and promoting desirable health behaviors at the time of distribution (monthly). The PAC program, on the other hand has no formal linkages with health services delivery, but works as a community resource not only for distribution but for community organization and education, and potentially for women's activities. PAC has 272 contacts per year with each participating household as compared with 10 to 12 in the BMI and PAMI programs. In all cases a centralized administrative structure plans and oversees implementation: PRAF and MOH for the BMI program, CARE and MOH for the PAMI program, and CARE and JNBS for the PAC program. In this section we first discuss study design issues, then program implementation, followed by results, and finally the implications for modifying programs to achieve greater impacts. A summary of programs impacts is provided in Table 26.

Study Design:

Several aspects of the study design have important implications for drawing conclusions regarding the health and nutrition impacts of the BMI, PAC and PAMI programs. These are:

- Because the design is not a random assignment of households to each program group, but rather a random sample of participants already enrolled in programs, it is possible that differences in impacts may be due to characteristics other than exposure to the programs. In addition, the study is a cross-sectional one, and we cannot confirm whether the program households were in fact similar in all respects prior to their participation in the program. These concerns were addressed in part through multi-variate analyses, in which a number of factors at the household, community, center and individual levels were controlled for to net out program impacts. The analytical models were implemented with and without several key variables, and a high degree of consistency in the results was obtained. Both the magnitude of

impacts and their statistical significance varied little when different versions of the models were run. This combined with the relatively few significant differences found across program groups in household characteristics provides a high level of confidence in the results on program impacts. Nevertheless, if program placement was in response to characteristics not observed in our data that have negative effects on the outcomes of interest, our estimates may understate the program effects -- perhaps differentially if such placement decisions were different for different programs (i.e., if the bonos programs were placed in worse areas than the others).

- A valid comparison of programs requires that each is in a stable period of operation, representative of long-term, routine functioning. This was the case for the two food programs: PAC and PAMI which have been underway for several years. The BMI program is a relatively new one having started in 1990/91, and experienced a suspension of several months during 1993/94. To compensate for this factor, which could bias the results against BMI, we delayed data collection until several months after start-up in 1994 and used the results only from those BMI participants who were actively and consistently participating in the program, while all participants (new entrants and old ones) were included in the PAC and PAMI analyses.

- The value of the BMI program has recently been increased to 30 lempiras per bono (instead of 20 lempiras per bono), thus the results may not be fully indicative of the current BMI program, although inflation has reduced any real impact of the increase on purchasing power.

- All the outcome variables were constructed from household surveys in which respondents were asked to recall the number and type of visits to health facilities in the preceding six months (for health services utilization), and food prepared and consumed during the previous day (for dietary intakes). There was no independent verification of these responses. However, the phrasing and sequence of questions, design of questionnaires and training of field staff focused considerable attention to this. Pre-tests and preliminary trials were undertaken over a several months. Communities similar to those of the study areas were used as field test sites to identify and resolve potential. In addition, food consumption data were collected on three non-consecutive days from each household and individual in the study. An average was taken.

A number of special measures were taken to minimize the possibility of bias in any one program group. Organization of the logistics of fieldwork included rotating supervisors and interviewers across study groups. Data collection was initiated across program groups and not in sequence to reduce confounding by seasons to the extent possible. Several control variables were created and used in multivariate analyses. These include: indicators of household income and possessions, education and structure; community development and infrastructure indicators; and indicators of seasonality (amount of rainfall and food prices). Internal validity checks and comparisons with other surveys and data indicate that there are

no systematic biases that might influence a comparative analysis of the programs, and values obtained are in a reasonable range. We consider the results as conclusive as any cross-sectional non-randomized study can provide.

Program Implementation:

Household surveys confirmed that at the time of the study, all three programs were being implemented as planned: PAMI and BMI participants were collecting rations or bonos respectively, on 75 to 80 percent of distributions held at health centers, and households were participating on an estimated 85 percent of days when PAC centers were open. On average each household had 1.5 (BMI), 2.0 (PAMI) and 2.1 (PAC) members participating in the programs. Sharing of cash and food transfers occurs among all members of the household in the BMI and PAMI programs as part of program design, and sharing may occur in the PAC programs through reduction in home consumption of targeted participants. The total value of benefits range from 170 lempiras per household per year in the PAMI program, to 300 lempiras in the BMI program, to approximately 560 lempiras for the PAC program. The PAC figure is deceptive, however, since each participant is expected to pay a fee for attending and to contribute labor, food and firewood for the maintenance of the program (Fiedler et al 1995). While the benefits are large in PAC, coverage is low (less than half the coverage of BMI). In PAMI, though the value of food rations is low relative to other programs, the convenience of obtaining food instead of coupons is appreciated by the participants. Many communities had poor access to food markets. When compared with incomes of the beneficiary households, the value of benefits in all programs, particularly in PAC is significant.

Coverage and Targeting:

Relative to the magnitude of the problem of poverty and childhood malnutrition, the three MCH programs taken together, cover a small proportion of households and children. We estimate that at 1993 beneficiary levels, the combined programs had the capacity to cover less than 15 percent of the households in need, if the programs were perfectly targeted to the poor and there was no program overlap. However, data from the national household survey of 1993/94 that takes into account program overlap, shows less than ten percent of households participated in one or more MCH program.

When the health center-based and primary schools-based bonos and food programs were analyzed for their success in reaching low income households, all food and cash transfer programs appeared to be targeted successfully to the more needy segments of the population, rather than to higher income groups in the country. This is in marked contrast to the availability of public services in Honduras. For example, education, electricity and health, are either skewed in favor of the better-off (education, electricity) or equally distributed (health). Both the bonos programs (BMI and BMJF) and merienda escolar (school feeding) are the best targeted of all transfer programs reviewed.

In addition to achieving household-level targeting by income, the bonos (BMI) program reaches households with malnourished children. PAMI and PAC (food program) households also showed a higher prevalence of malnourished children than no program households.

Value of Benefits:

The annual value (1993 lempiras) of program benefits transferred averaged 170 lempiras per household in the PAMI program, 300 lempiras per household in the BMI program and 560 per household in the PAC program (410 lempiras after netting out participation costs). Household incomes (based on an assessment of expenditures) for the poorer half of the study population averaged 7900 lempiras. The value of benefits relative to household incomes were: 2 percent for PAMI, 4 percent for BMI and 7 percent for the PAC program. For the lowest quintile, the benefits were in the range of 3 percent of household income from PAMI, 5 percent for BMI and 9 percent for PAC.

Impacts on Health Services Utilization:

With respect to program impacts on health services utilization, there is a significant positive effect of participation in the PAMI (take-home food) program on the number of preventive health visits made for maternal and child health services to CESARs and CESAMOs. PAMI participants made an additional 4.9 visits per year to health centers. The bonos program showed no significant effect. There was an indication of negative effects possibly due to the suspension of bono programs in 1993/94. Families that experienced this disruption tended to make fewer visits to health centers for preventive care. Among other factors playing an important role in determining health center use, were: community infrastructure (presence of electricity and piped water were associated with increased health center visits), seasonality (food scarcity in the preceding six months was associated with reduced visits), remoteness from urban areas (reduced visits), and household size (larger families used the centers less).

The quality of services provided by health centers was assessed through observations of client-provider interactions, and use of check lists developed for each of the following types of visits: prenatal care, growth monitoring, diarrhea case management and ARI case management. There was no evidence that the quality of services provided by health centers implementing the BMI and PAMI programs was lower than in non-program centers. In fact both programs, and in particular the PAMI centers, were consistently performing better than the no program centers. The differences across study groups were not statistically significant. In exit interviews, health center clients reported a high level of satisfaction in all groups of centers. Clients in the non-program centers expressed greater satisfaction and on three of the four components analyzed (waiting time less than median, would recommend center to someone else, and health care worker was easy to understand), the no program group had slightly higher (statistically significant) scores.

The results of the observations of interactions between providers and clients for each type of visit identified a number of areas for strengthening in all groups of centers. For example, in case management of diarrhea patients, the provision of education regarding infant feeding was lacking. In growth monitoring, failure to undress the child, lack of child feeding education, and not conducting a dialogue with the mothers, are problems which signal areas for strengthening. Not teaching children's caretakers to observe risk signs of ARI were lacking in many cases. In prenatal care visits: family planning counselling, screening for clinical signs of anemia, and preparation for breastfeeding were areas of weakness.

The disturbing finding from a KAP survey of mothers on questions concerning maternal/child health and infant feeding is that the vast majority of mothers from all groups are not aware of, or not practicing, the most critical maternal health and child survival actions that they need to take. With respect to program impacts, mothers participating in PAMI had higher knowledge, awareness, and practices (KAP) scores. Bonos (BMI) participants also had higher scores than no-program mothers. The results are reassuring in that although bonos program participants did not demonstrate increased health center visits, the first step in the pathway to improved utilization may be taking place. This can be strengthened further through more intensive education and motivation of BMI participants at each bonos visit. Although the improvements attributable to programs were significant statistically, they are small in relation to desired objectives.

Household Food Security:

On average, calorie consumption was 2860 ± 1020 per adult equivalent per day (compared with a recommended level of 2800 per AE/day). However, this average masks important disparities among groups of households and within households. An estimated 30 percent of households did not consume even 80 percent of recommended calorie levels. Individual dietary intake data showed that pregnant women's food consumption is especially poor. Household protein consumption averaged $64 \text{ grams} \pm 26$ per AE/day, well above adequate levels. Average vitamin A consumption was extremely low, only 25 percent of recommended levels, and even lower among pregnant and lactating women. Calorie and protein intakes were highly correlated, but vitamin A intake was neither correlated with calories nor protein intakes. The results indicate the need for a broadly targeted strategy for vitamin A including universal distribution of supplements and fortification of sugar with vitamin A.

With respect to the dietary impacts of programs, PAMI and PAC have positive and significant effects on caloric consumption of households, controlling for the other variables. Each household in the PAMI or PAC, was consuming an estimated 250 to 350 more calories per AE than the no program group. The bonos program showed no significant difference from the no program group. Other factors influencing household caloric adequacy include: income, household size and composition (larger households and those headed by women tend to consume fewer calories), seasonality (food scarcity was associated with lower and rainy season with higher calorie adequacy), and distance from food market (lower adequacy).

Impacts on protein intakes per household AE were also positive and significant for the PAMI program.

Dietary Intakes of Adolescent Girls and Women:

When intakes of adolescent girls and women were examined, PAC program showed positive and significant effects on calorie consumption relative to their recommended levels of intake, after taking into account other individual, household, and community differences in the study groups. Other factors influencing adolescent girls' and women's caloric adequacy include: pregnancy and lactation (lower adequacy), household size (lower adequacy), seasonality (lower adequacy during food scarcity months).

The PAC program showed a positive and significant effect on protein consumption of adolescent girls and women relative to their recommended levels of intake. The bonos and PAMI groups showed no significant effect. Other factors influencing adolescent girls' and women's protein adequacy include: pregnancy and lactation (lower adequacy), seasonality (lower adequacy during food scarcity months). None of the programs showed a significant effect on vitamin A adequacy which continued to remain low. Other factors influencing vitamin A intakes were: lactation (less adequate), income, education (schooling of the male head of household was associated with improved adequacy), season ("scarcity months" was negatively related).

Dietary Intakes of Young Children:

Both food programs (PAC and PAMI) have positive and significant effects on calorie consumption of children relative to their recommended levels of intake. The magnitude of the effect was approximately an additional 172 calories per day for the PAMI group, and approximately 171 additional calories for the lactarios group as compared with the no program group. The bonos program showed no significant difference from the no program group. Other factors affecting children's intakes include: diarrhea (lower caloric adequacy), piped water (more calories), season (rainy months reduced caloric consumption), distance of the community from the nearest urban area (low adequacy), and distance of the home from the weekly food market (low adequacy).

Protein consumption by children was significantly higher in all programs, including bonos BMI. Other factors influencing protein adequacy include: age (older children were consuming more adequate levels), diarrhea (lower protein adequacy), income (improved with income), season ("scarcity" was significantly and negatively related to protein adequacy), number of rainy months (associated with reduced protein adequacy), distance to the weekly food market (lower adequacy).

With reference to vitamin A intakes of children, the PAC program showed a positive and significant effect on vitamin A consumption of children. The PAMI program also improved intakes. The bonos program had no significant effect. Other factors influencing vitamin A

adequacy include: age (older children were consuming less adequate levels), education (improved with male household head's education), season ("scarcity" was significantly and negatively related to vitamin A adequacy), distance to the nearest urban area (lower adequacy).

Program Improvements:

The PAMI and PAC programs consistently seem to be related to better outcomes with regard to the indicators of health and nutrition on which we focus in our evaluation. We do not know what program most increased the welfare of households. The consistently higher performance of the PAMI and PAC programs are likely to be due to several factors. Firstly, the programs are of longer standing than BMI, and presumably once health center staff have mastered the logistical and reporting demands of distributions, can devote more effort to health and educational activities accompanying the food distribution. Secondly, as mentioned earlier, the BMI appears to have suffered serious setbacks due to program suspension in 1993/94. Thirdly, in the food programs, CARE and counterpart agency supervisors give greater importance to the education and health inputs accompanying the food distribution than do BMI staff. This was evidenced by better health service quality scores and mothers' KAP scores in PAMI. A number of households in BMI reported not receiving additional services on bonus visit days. The magnitude of dietary impacts suggests a synergistic effect if food rations in combination with education. The PAC program has an additional advantage of providing substantially greater benefits, both in income and nutritional value. Fourthly, the higher estimated performance of the PAMI and PAC programs may reflect that the other programs were placed in worse areas in unobserved, as well as observed respects, so their effects are more underestimated. Only with longitudinal data could this possibility be explored.

In general, the study suggests the need for strengthening the quality of health services provided by CESARs and CESAMOs. The emphasis should be on case management for ARI and diarrhea, and for preventive maternal and child health services. Health center clients spend a large amount of time per visit and ways of reducing waiting time and/or utilizing the time for group education classes or counselling should be explored given low KAP scores of mothers. The lack of family planning services provided through CESARs and CESAMOs is a particularly serious gap with broad implications. All the outcomes examined in this study through multivariate analyses, pointed to the detrimental effect of large family size in Honduras, after controlling for other factors. The possibility of emphasizing family planning education at lactarios and their close linkages with community-based distribution of contraceptives should be explored.

Strengthening broad-based micronutrient strategies are important in light of the growing evidence that intakes of vitamins and minerals can have important mortality and growth consequences in young children (Allen 1995), and given the severe shortage of vitamin A (and possibly other micronutrients) in Honduran diets found in this study.

In addition to focused nutrition and health interventions, the study found evidence of important effects of other sectoral activities. The importance of infrastructure development in remote rural areas cannot be emphasized enough. In almost every analysis undertaken in this study, one or another of the following variables were found to play a critical role, after controlling for other factors: whether or not the community was connected by paved roads, had electricity, piped water and sewer systems, and access to food markets. The possibility of coordinating infrastructure development with improvements in the food and cash transfer programs needs to be explored with the objective of maximizing complementarities and thus impacts of a combined strategy on maternal/child health and nutrition, and household food security.

The study results strongly suggest that seasonal food shortages play a significant role in perpetuating hunger and malnutrition in Honduras. This had been suggested by the qualitative research undertaken by CARE in 1994. Long-term, sustainable policies and programs to stabilize food prices in rural areas combined with strategies for short-term mitigation of seasonal shortages should be a high priority in any comprehensive plan to address nutritional problems.

The proposed new CARE/Honduras plan (1995) is consistent with the findings of this study that infrastructure and seasonal food shortages are key constraints for improving household food security and maternal/child health. However, there is no evidence that the specific activities being proposed by CARE will result in positive impacts, or when and how much improvement can be expected. The evidence is strong, on the other hand, that the current MCH programs - both PAMI and PAC should be continued, albeit in a modified and more focused manner.

Issues that need to be included in an assessment of options for improving program impacts should take into account the sustainability of both the BMI and food programs. During its short lifespan, the bonos program suffered a significant interruption in services. The budgetary implications of bonos for Honduras, in the event that donors cut back on support for the program, is no doubt an issue. For food programs as well, budgetary cuts in the U.S. may reduce Title II food availability over the next few years.

In conclusion, the PAMI program has significant positive impacts on health services utilization and food consumption by households, women and children. The PAC program has significant positive effects on food consumption. The BMI program showed little evidence of these impacts. It appears to function more successfully as a means of cash transfer than as a means of improving maternal and child health, based on the outcomes included in this study. However, with more consistent (uninterrupted) implementation and stronger emphasis on accompanying services, in particular, education on maternal and child health and health services, the BMI has the potential to make a difference, given that it is successful in reaching the poorest households. Lack of access to food markets may be a constraint that will continue to limit the food security benefits of BMI, however, unless increased purchasing power due to cash transfer programs (BMI and BMJF) and other policies expand retail food outlets.

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Tables

Table 1. Componentes del estudio y tamaño de las muestras

Centros de Salud n = 60	Lactarios n = 19
Número de consultas Inventario Personal Interacciones observadas n = 1635 Entrevistas de salida n = 675 Descripción del programa Costos del programa	Inventario Personal Descripción del programa Costos del programa
Familias n = 1079	Familias n = 339
Socioeconómico Demográfico Educación Gastos Consumo alimentario madres n = 1295 niños n = 2182 Antropometría n = 2384 Morbilidad CAP de las madres Utilización de los servicios de salud Fecundidad y uso de anticonceptivos	
Comunidades n = 338	
Infraestructura Precios de los alimentos Servicios de atención de salud Servicios de planificación familiar	

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Table 2
Centros por Región y Area
Centers by Region and Area

	GRUPO						Total
	Bonos		Alimentos		Ninguno		
	CESAR	CESAMO	CESAR	CESAMO	CESAR	CESAMO	
No. Centros	7	13	17	3	18	2	60
Región de Salud							
Región 1							
Area de salud							
1			7	1	1		9
Región 2							
Area de salud							
2			2		1		3
4		1					1
5	2	1					3
Región 3							
Area de salud							
4	1	2					3
7	1	5			2		8
Región 4							
Area de salud							
2					3		3
3			4		2	1	7
4			1				1
5			1		5		6
Región 5							
Area de salud							
1		1	1	1	2		5
2			1	1	1		3
3	3	2					5
4		1			1	1	3

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Table 3
Centros por Departamento
Centers by Department

	GRUPO				TOTAL
	Bonos	Alimentos	Lactario/ CEDIN/CNC	Ninguno	
Centros	20	20	19	20	79
Departamento					
Copan		2	1	2	5
Choluteca		5	6	10	21
El Paraíso		8	2	2	12
Intibuca		2	3	1	6
La Paz	4	1	1		6
Lempira		2	5	3	10
Ocotepeque	6				6
Santa Barbara	10		1	2	13

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Table 4
Viviendas por Departamento
Households by Department

	GRUPO				TOTAL
	Bonos	Alimentos	Lactario	Ninguno	
No. Vivienda	357	356	335	335	1403
Departamento					
Copan	3	36	16	35	90
Choluteca		90	98	178	366
El Paraíso		141	31	35	207
Intibuca		36	54	18	108
La Paz	72	18	36		126
Lempira		35	82	53	170
Ocotepeque	107				107
Santa Barbara	175		18	36	229

Table 5

Características de los Hogares

Household Characteristics

	Grupo				Total
	Bonos	Alimentos	Lactario	Ninguno	
No. de Viviendas	360	360	339	359	1418
No. personas en la familia					
Promedio	6,6	6,6	6,9	6,9	6,7
DE	2,4	2,8	2,6	2,6	2,6
Mujeres > 12 años y < 60					
Promedio	1,4	1,6	1,6	1,6	1,5
DE	0,8	0,9	0,9	0,9	0,9
Niño < años					
Promedio	1,8	1,8	1,6	1,7	1,7
DE	0,9	0,9	0,9	0,8	0,8
Mujer jefe de la familia	13,7	10,1%	16,4%	10,4%*	12,6%
Grado de educación (madre)	2,1	2,5	2,2	2,8	2,4
Grado de educación (padre)	2,0	2,5	2,3	2,2	2,3
Material de piso (tierra)	80,0%	82,8%	79,9%	73,5%*	79,1%
Fuente de agua (llave dentro o dentro de propiedad)	55,3%	56,1%	55,2%	42,6%*	52,3%
Servicio sanitario					
Inodoro	1,4%	0,3%	0,6%	1,1%*	0,8%
Letrina hidráulica	29,4%	20,6%	29,8%	17,3%	24,2%
Letrina de fosa simple	26,9%	32,2%	23,6%	27,0%	27,5%
No tiene/otro	42,2%	46,9%	46,0%	54,6%	27,5%
Electricidad	11,7%	14,4%	11,8%	10,9%	12,2%
La vivienda tiene:					
Refrigerador	1,9%	2,8%	2,4%	3,9%*	2,8%
Radio	44,2%	54,4%	53,4%	47,6%*	49,9%
Televisión	2,5%	6,4%	4,7%	7,8%*	5,4%
Bicicleta	4,7%	15,3%	7,7%	7,8%*	8,9%
Caballo/mula/burro	18,3%	22,2%	10,0%	22,3%*	18,3%
Tierra para cultivos/pasto (>5 manzanas)	1,9%	2,2%	2,4%	4,5%*	2,8%
Participación en BMJF	5,3%	23,7%	41,1%	38,5%*	26,9%
Costo total de cada visita de la madre al centro (Lps)					
Promedio	3,15%	2,59%	2,13%	1,99%	2,47%
DE	6,32%	9,07%	4,84%	3,99%	6,38%
Gastos total (Lps)					
Promedio	7400	8200	9200	11000	8900
DE	4400	5500	5400	13000	7800

* Diferencias significantes al nivel de 0,05.

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TABLE 6
COMMUNITY CHARACTERISTICS

	Grupo				Total
	Bonos	Alimentos	Lactarios	Ninguno	
No. de comunidades	121	107	26	134	388
Distance in km to nearest town					
Mean	14.88	13.59	22.33	19.06 *	16.47
Std Deviation	16.45	12.51	24.98	15.81	16.15
Median	8.00	10.00	9.75	14.00	10.50
Total health services within 30km					
Mean	4.50	4.72	NA	3.61 *	3.95
Std Deviation	3.69	3.69	.	2.87	3.48
Median	4.00	3.00	.	3.00	3.00
Total minutes to CESAR [1]					
Mean	102.67	57.36	48.00	67.54	76.12
Std Deviation	72.21	49.19	26.83	57.59	63.31
Median	97.50	45.00	30.00	60.00	60.00
Total minutes to CESAMO [1]					
Mean	88.93	112.78	53.71	96.11 *	97.10
Std Deviation	68.72	75.50	40.27	72.44	72.03
Median	75.00	90.00	45.00	60.00	90.00
Total minutes to hospital [1]					
Mean	184.70	148.32	78.20	182.16 *	171.19
Std Deviation	99.69	98.42	45.07	113.52	105.21
Median	180.00	120.00	90.00	180.00	150.00
Total minutes to private clinic [1]					
mean	101.79	106.99	77.67	101.09 *	102.75
Std Deviation	90.76	60.24	84.89	73.77	76.67
Median	90.00	90.00	52.50	60.00	90.00
Health promotor in community	81.8%	62.6%	NA	82.7% *	76.5%
Transport by foot	54.5%	52.3%	30.8%	34.3% *	45.4%
Transport by bus	18.2%	33.6%	42.3%	26.1% *	26.8%
Paved road	7.4%	7.5%	7.7%	14.9%	10.1%
Running water	50.4%	61.7%	80.8%	53.0% *	56.4%
Water from river, spring, ravine or lake	41.3%	29.0%	11.5%	24.6% *	30.2%
Electricity	14.9%	19.6%	15.4%	6.7% *	13.4%
Pit for a latrine	40.5%	41.1%	42.3%	31.3%	37.6%

Source: Questionnaire mc21, Questions 101, 104-110, 118, 120, 122, 130, 142, 146, 150
Questionnaire mc22, Questions 101, 104-110, 115, 117

Note: [1] Missing more than 10% of cases
[2] Has only one case
. Missing all cases
* Significantly different at the 0.05 level

USAID/LAC HNS - ESTUDIO MATERNOINFANTIL

Table 7

Características de los hogares y participación del programa por cuartil de gastos

	Cuartiles de gastos/año				Total
	Cuarto (alto)	Tercero	Segundo	Primero (bajo)	
Número de familias	591	591	592	591	2.365
Electricidad	82%	58%	40%	16%	49%
Agua corriente	82%	72%	64%	57%	69%
Baño o letrina	93%	82%	68%	58%	75%
Centro de salud < 1 hora de camino	78%	69%	64%	64%	69%
Educación de la madre 6 o más años	38%	21%	17%	6%	20%
Educación del padre 6 o más años	38%	26%	18%	10%	23%
La familia recibe BMI o BMJF bonos	5%	10%	14%	33%	15%
La familia recibe Lactarios/CEDIN/CNC, CARE/PAMI, o PAMI	4%	5%	6%	6%	5%
La familia recibe bonos BMI	3%	3%	4%	11%	5%
La familia recibe BMJF	3%	7%	10%	22%	11%
La familia recibe Lactario/CEDIN/CNC alimento	0%	0%	1%	2%	1%
La familia recibe CARE/PAMI o PMA	4%	5%	5%	4%	5%
La familia recibe merienda escolar	11%	22%	35%	46%	29%

Fuente: Encuesta nacional de familias, 1993-94.

**Table 8. Percent of Children Malnourished In Bonos and Non-Bonos Households
(National Survey 1993/94)**

	Height/age	Weight/age	Weight/height
National:			
Bonos	48.0	27.2	16.6
Non-bonos	36.5	18.8	12.9
Urban:			
Bonos	40.2	25.6	20.1
Non-bonos	29.2	11.4	12.0
Rural:			
Bonos	49.9	27.6	15.7
Non-bonos	41.8	24.4	13.6

NOTE: Cut-off points for height/age and weight/age are -2 Z scores and for weight/height -1 Z score.

**Table 9. Estado Nutricional por Grupo de Estudio
(niños < 5 años)**

Grupos	Grupos del Programa (% de niños)				
	Bonos	Raciones	Lactario	No. Prog.	Total
Todos combinados: Número de niños	629	615	526	614	2384
Estatura/edad - 2 Z resultados	52	38	40	36*	42
Peso/edad - 2 Z resultados	33	27	26	21*	27
Peso/estatura - 2 Z resultados (-1 Z resultado)	3 (19)	2 (19)	4 (21)	2 (17)	3 (19)

*Las diferencias entre los grupos del programa significantes al nivel confiable de 0,05.

**Table 10. Program Participation Impacts on Number of Visits
for Maternal Health Services in the Past 6 Months**

Program Variable	Coefficient	Significance	No. additional visits per year/woman in the HH
Bono Visits 1	-.147	.544	0
Bono Visits 2	-.038	.846	0
Bono Visits 3	-.019	.923	0
Rac94 (PAMI/MOH)	.524	.006	1.04

[Overall regression $F=3.91$, $p=.0000$; adjusted $R^2=.192$; $n=758$]

Table 11. Impactos de participación en el programa sobre el número de consultas de servicio de atención de salud infantil en los último seis meses

Variables del Programa	Coefficiente	Importancia	Número de consultas adicionales por año/mujeres en los hogares
Consultas Bono 1	,246	,499	0
Consulta Bono 2	,091	,757	0
Consulta Bono 3	,280	,349	0
PAMI	,959	,001	1,92 consultas

[Regresión total $F = 3,81$; $p = 0,0000$; ajustada $R^2 = ,189$; $n = 772$]

**Table 12. Program Participation Impacts on Number of Visits
for Maternal or Child Health Services in the Past 6 Months**

Program Variable	Coefficient	Significance	No. additional visits per year/child and woman in the HH
Bono Visits 1	0.053	.792	0
Bono Visits 2	0.077	.637	0
Bono Visits 3	0.149	.369	0
PAMI/MOH	0.759	.000	1.52

[Overall regression $F=5.20$, $p=.0000$; adjusted $R^2=.256$; $n=794$]

USAID/LAC HNS - ESTUDIO MATERNOINFANTIL

Table 13

Índice de la Calidad de Servicios de Salud

	Grupo			
	Bonos	Alimentos	Ninguno *	Total
Tiempo de espera menos del promedio	35%	49%	55% *	46%
Recomendaría el centro a alguien más [1]	94%	100%	100% *	98%
Puntaje de satisfacción [1]				
Promedio	1,16	1,21	1,24	1,20
D.E.	0,32	0,25	0,30	0,29
Promedio	1,00	1,11	1,13	1,08
Trabajador de salud fácil de entender [1]	94%	79%	100% *	91%
Índice de satisfacción				
Promedio	0,71	0,73	0,78	0,74
D.E.	0,12	0,11	0,13	0,12
Interacciones -				
Planificación familiar [1]				
Número de entrevistas	35	35	24	94
Promedio	0,79	0,86	0,78	0,82
D.E.	0,26	0,13	0,21	0,20
Interacciones - Diarreas				
Número de entrevistas	108	0,88	0,58	254
Promedio	0,56	0,61	0,52	0,56
D.E.	0,18	0,17	0,18	0,18
Interacciones - IRA				
Número de entrevistas				
Promedio	179	149	118	446
D.E.	0,61	0,66	0,54	0,60
D.E.	0,22	0,19	0,21	0,21
Interacciones - Prenatal				
Número de entrevistas				
Promedio	155	148	93	396
D.E.	0,70	0,73	0,65	0,69
D.E.	0,11	0,13	0,12	0,13
Interacciones - Crecimiento				
Número de entrevistas				
Promedio	158	180	129	467
D.E.	0,66	0,75	0,61	0,67
D.E.	0,14	0,09	0,13	0,13
Índice de Calidad				
Promedio	0,98	1,07	0,95	1,00
D.E.	0,19	0,15	0,16	0,18

NOTAS: El índice de la calidad es un promedio de cada una de las cinco interacciones más el índice de satisfacción.

*Diferencias considerables al nivel 0,05 [1] se omitió del 10% de los casos.

Table 14. Comparison of Additional Visits and Quality-Adjusted Visits¹

Program Variable	Maternal Visits	Child Visits	Combined Visits
Bono Visits 1	0	0	0
Bono Visits 2	0	0	0
Bono Visits 3	0	0	0
PAMI	1.0 vs 1.1	1.9 vs 2.2	1.5 vs 1.7

1. The average Quality Index for health centers with programs, as compared with no program health centers was: 1.12 for PAMI health centers and 1.03 for Bonos health center, based on averages given in Table 13.

USAID/LAC HNS - ESTUDIO MATERNO INFANTIL

TABLE 15
KNOWLEDGE: HEALTH + NUTRITION

	Grupo				Total
	Bonos	Alimentos	Lactario	Ninguno	
No. Madres (mothers)	360	360	339	358	1417
Primer control prenatal (≤ 3 meses) (<i>1st prenatal visit ≤ 3 mo.</i>)	90.6%	87.8%	87.9%	85.5%	87.9%
Cuántas veces debe hacer control prenatal (≥ 3) (<i>No. visits ≥ 3</i>)	96.1%	97.8%	97.6%	95.3%	96.7%
A qué edad debe llevar el niño al médico o centro de salud la primera vez (≤ 10 días) (<i>First visit of infant ≤ 10 days</i>)	5.6%	6.1%	5.9%	3.6%	5.3%
Cuántas veces debe llevar el niño, < 1 año (≥ 6) (<i>No. visits in 1st year of life ≥ 6</i>)	68.3%	76.1%	64.3%	62.3%	67.8%
Si el niño tuvo diarrea, con síntomas de deshidratación debe ir al centro de salud (<i>visit health center if child dehydrated</i>)	84.4%	85.3%	86.1%	81.6%	84.3%
Si el niño tuvo IRA debe ir al centro de salud (<i>ARI - visit health center</i>)	92.5%	89.4%	88.5%	86.3%	89.2%
Empezar a dar otros líquidos al niño lactante (≥ 4 meses) (<i>Introduce other liquids ≥ 4 mo.</i>)	55.3%	50.6%	51.6%	48.9%	51.6%
Como puede aumentar leche (amamantando más seguido) (<i>BF on demand</i>)	1.7%	1.7%	.0%	.8%	1.1%
Preferencia para asignar pocos alimentos (niños pequeños, mujeres embarazada o lactantes) (<i>Intra household food distribution: mother + child</i>)	90.6%	89.7%	90.9%	91.3%	90.6%
Cuando tiene diarrea.. sigue dando pecho (<i>Continue BF if child has diarr.</i>)	54.4%	70.0%	66.7%	66.5%	64.4%
Cuando tiene diarrea.. alimentos con frecuencia (<i>Feed frequently if diarrhea</i>)	54.2%	47.8%	56.6%	46.9%	51.3%
Después diarrea, aumenta cantidad de comida (<i>Incr. amt. food after diarr.</i>)	17.5%	19.2%	27.1%	11.7%	18.8%

Source: Questionnaire MC07, preguntas 11-31.

* Diferencias significativas al nivel de 0.05.

TABLE 16

Practices - MCH

	Grupo				Total
	Bonos	Alimentos	Lactario	Ninguno	
No. Madres	360	360	339	358	1417
Fue a control prenatal	77.2%	90.6%	78.5%	79.6% *	81.5%
Cuantos meses de embarazo tenia, primera consulta (<=3)	49.7%	57.8%	51.0%	47.5% *	51.5%
Cuantas veces visito (>=3)	61.1%	74.4%	69.6%	64.2% *	67.3%
Visito alguien para control post-parto	36.7%	39.4%	44.5%	33.5% *	38.5%
A cuantos dias visito para control post-parto (<=10 dias)	18.3%	13.1%	17.4%	15.6%	16.1%
Llevo el nino al medico o centro de salud	79.4%	80.6%	78.2%	75.7%	78.5%
A cuantos dias llevo el nino la primera vez (<=10 dias)	11.9%	10.3%	10.3%	10.6%	10.8%
Si el nino tuvo diarrea, uso litrosol	16.9%	16.4%	12.7%	15.9%	15.5%
Si el nino tuvo diarrea, con moco, sangre, vomitos, consulto CESAMO, CESAR o hospital	3.6%	6.7%	2.1%	4.5% *	4.2%
Si el nino tuvo IRA, consulto CESAMO, CESAR o hospital	8.1%	10.6%	3.8%	5.6% *	7.1%

Source: MC07, MC08, preguntas 37, 40, 41, 46, 47, 50, 51, 55.

* Diferencias significativas al nivel de 0.05.

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Table 17. Impact of Program Participation on Mothers' Knowledge and Practices Scores¹

Program Variable	Coefficient	Significance
Bono Visits 1	-.002	.876
Bono Visits 2	0.045	.001
Bono Visits 3	0.002	.905
PAMI	0.046	.000

[Overall regression $F=3.67$, $p=.0000$; adjusted $R^2=.120$; $n=1094$]

Table 18. Program Participation Impacts on Household Calorie Consumption/AE

Program Variable	Coefficient	Significance
Bono Visits 1	180	.269
Bono Visits 2	22	.868
Bono Visits 3	190	.156
PAMI	348	.000
PAC	281	.025

[Overall regression $F=3.56$, $p=.0000$; adjusted $R^2=.113$; $n=931$]

Table 19. Impact of Program Participation on Household Protein Consumption/AE

Program Variable	Coefficient	Significance
Bono Visits 1	5.38	.200
Bono Visits 2	1.52	.652
Bono Visits 3	4.34	.207
PAMI	8.24	.001
PAC	3.30	.305

[Overall regression F=3.37, p=.0000; adjusted R²=.106; n=931]

Table 20. Impact of Program Participation on Women's Caloric Adequacy

(Adequacy = percent of recommended)

Program Variable	Coefficient	Significance
Bono Visits 1	1.0	.883
Bono Visits 2	- 1.9	.719
Bono Visits 3	0.7	.898
PAMI	5.1	.193
PAC	15.7	.003

[Overall regression $F=2.13$, $p=.0000$; adjusted $R^2=.064$; $n=895$]

Table 21. Impact of Program Participation on Women's Protein Adequacy

(Adequacy = percent of recommended)

Program Variable	Coefficient	Significance
Bono Visits 1	1.2	.882
Bono Visits 2	-3.6	.567
Bono Visits 3	-2.1	.750
PAMI	4.3	.354
PAC	13.3	.029

[Overall regression $F=2.61$, $p=.0000$; adjusted $R^2=.089$; $n=895$]

Table 22. Impact of Program Participation on Women's Vitamin A Adequacy

(Adequacy = percent of recommended)

Program Variable	Coefficient	Significance
Bono Visits 1	-1.8	.800
Bono Visits 2	-1.6	.780
Bono Visits 3	-3.5	.552
PAMI	0	.997
PAC	2.9	.587

[Overall regression F= 3.21, p=.0000; adjusted R²=.118; n=895]

Table 23. Impact of Program Participation on Children's Caloric Adequacy

(Children < 60 months)

(Adequacy = percent of recommended)

Program Variable	Coefficient	Significance
Bono Visits 1	4.4	.436
Bono Visits 2	7.8	.103
Bono Visits 3	-0.8	.863
PAMI	12.4	.000
PAC	13.4	.005

[Overall regression $F=4.57$, $p=.0000$; adjusted $R^2=.156$; $n= 982$]

Table 24. Impact of Program Participation on Children's Protein Adequacy

(Children < 60 months)

(Adequacy = percent of recommended)

Program Variable	Coefficient	Significance
Bono Visits 1	6.3	.078
Bono Visits 2	11.3	.041
Bono Visits 3	-1.8	.410
PAMI	14.4	.002
PAC	21.1	.001

[Overall regression $F=4.50$, $p=.0000$; adjusted $R^2=.154$; $n= 982$]

Table 25. Impact of Program Participation on Children's Vitamin A Adequacy

(Adequacy = percent of recommended)

Program Variable	Coefficient	Significance
Bono Visits 1	-0.1	.987
Bono Visits 2	3.4	.603
Bono Visits 3	-7.6	.253
PAMI	9.7	.043
PAC	14.8	.021

[Overall regression $F=9.56$, $p=.0000$; adjusted $R^2=.308$; $n=982$]

Table 26. Summary of Health and Nutrition Impacts of Program Participation

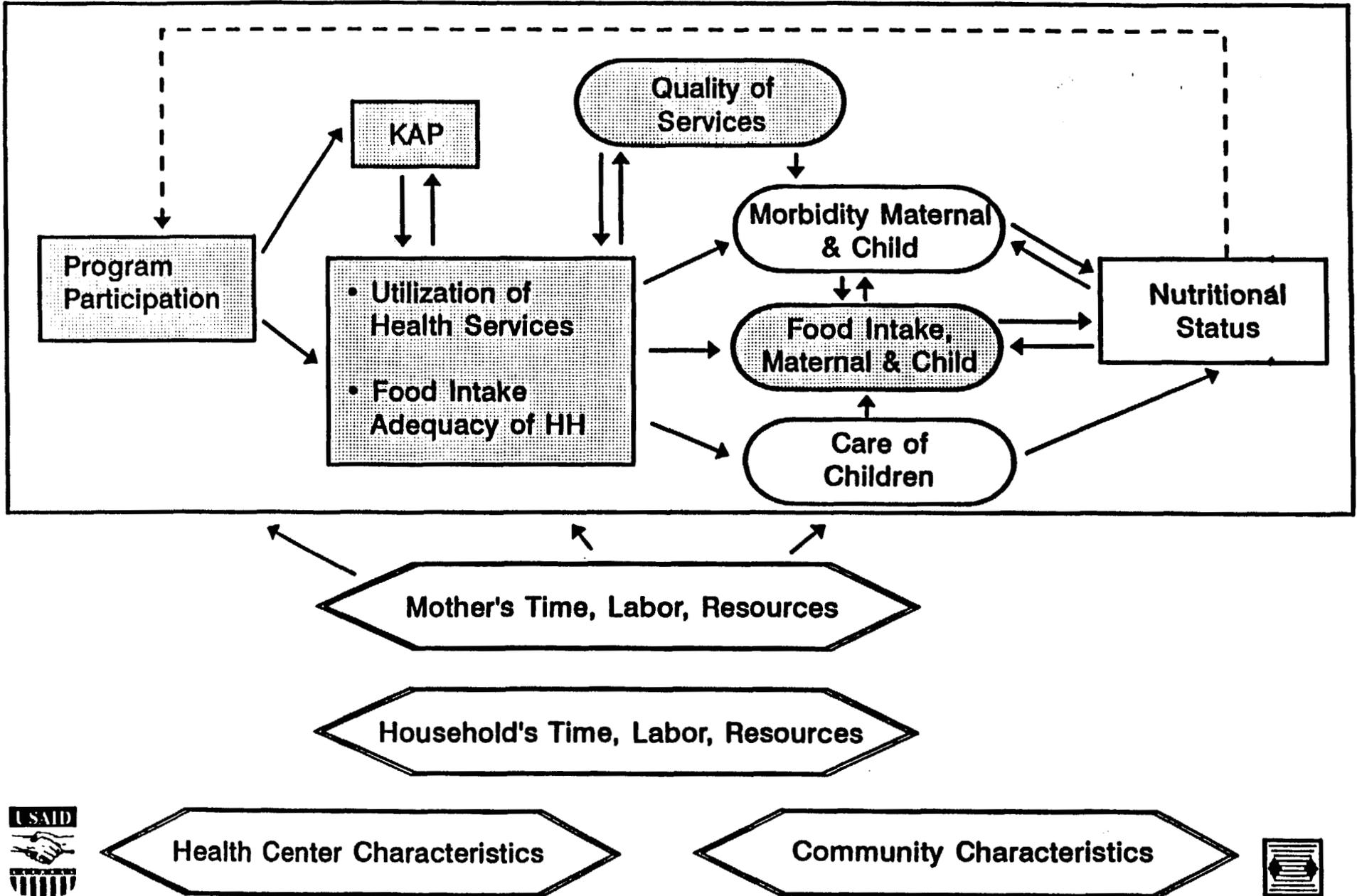
	Bonos (BMD)	PAMI	PAC
HOUSEHOLDS			
Preventive health visits/yr.	-	4.9***	NA
Calories/AE	-	350***	280*
Protein/AE (gms.)	-	8.2***	-
MOTHERS			
Preventive health visits/yr.	-	1.6**	NA
KAP scores: knowledge	+2%	+3%	+3%
practices	+1%	+5%	+3%
Calorie adequacy	-	-	+15.7%**
Protein adequacy	-	-	+13.3%*
Vitamin A adequacy	-	-	-
CHILDREN			
Preventive health visits/yr.	-	3.9***	NA
Calorie adequacy	-	+12.4%***	+13.4%**
Protein adequacy	+11.2+	+14.4%**	+21.1%***
Vitamin A adequacy	-	+9.1%**	+12.6%***
HEALTH SERVICES QUALITY			
Client satisfaction (score as % of no program group)	-9%	-6%	NA
Observed interactions (actions taken as % of checklist)	+5%	+11%	NA

+ Significant at $p \leq 0.1$, * Significant at $p \leq 0.05$, ** Significant at $p \leq 0.01$
 *** Significant at $p \leq 0.001$

Figures

Honduras Food and Income Study: MCH Programs

Conceptual Framework



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FIGURE 2

Honduras Food and Income Study: MCH Programs

Honduras Bonos and Food Programs

Study Area

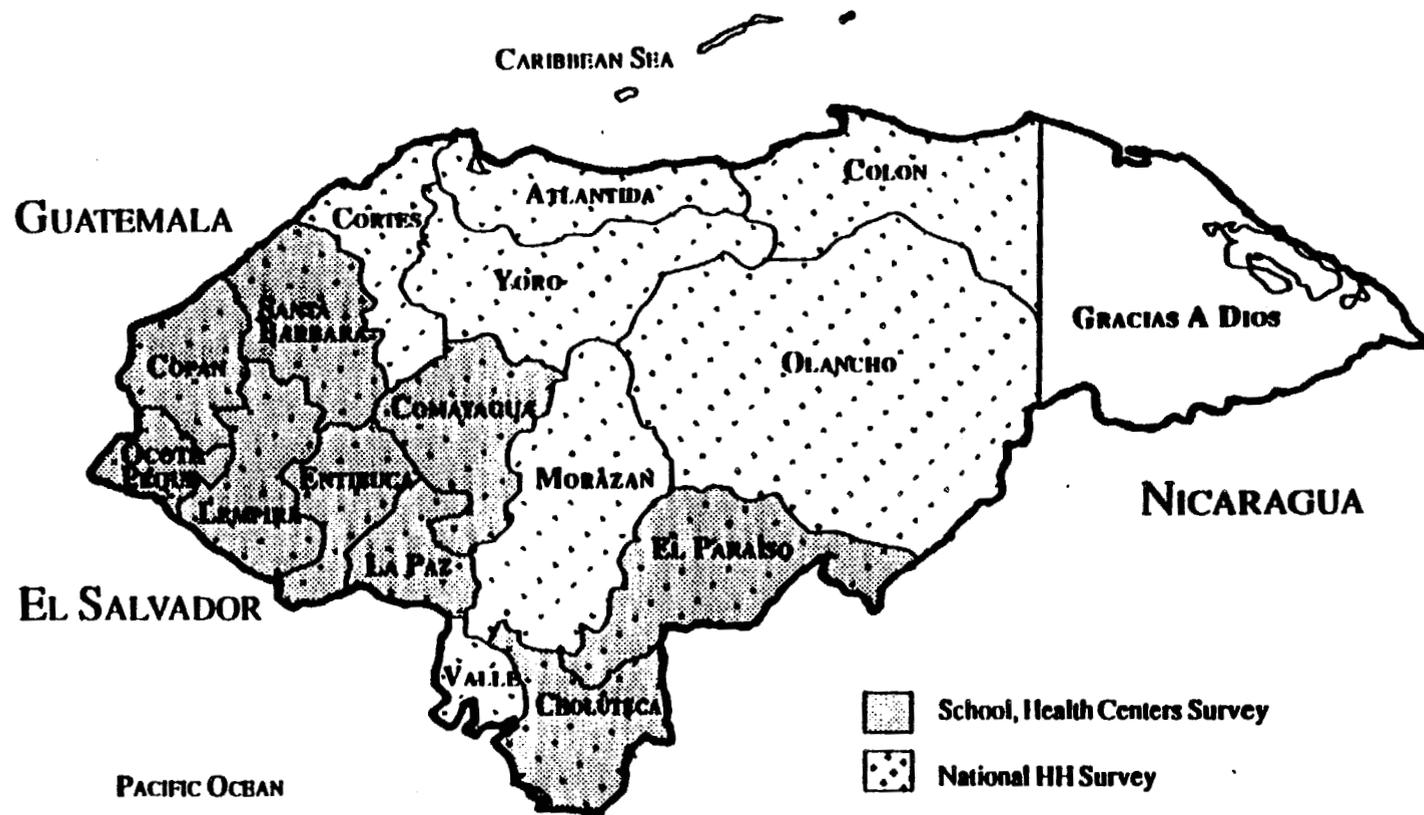
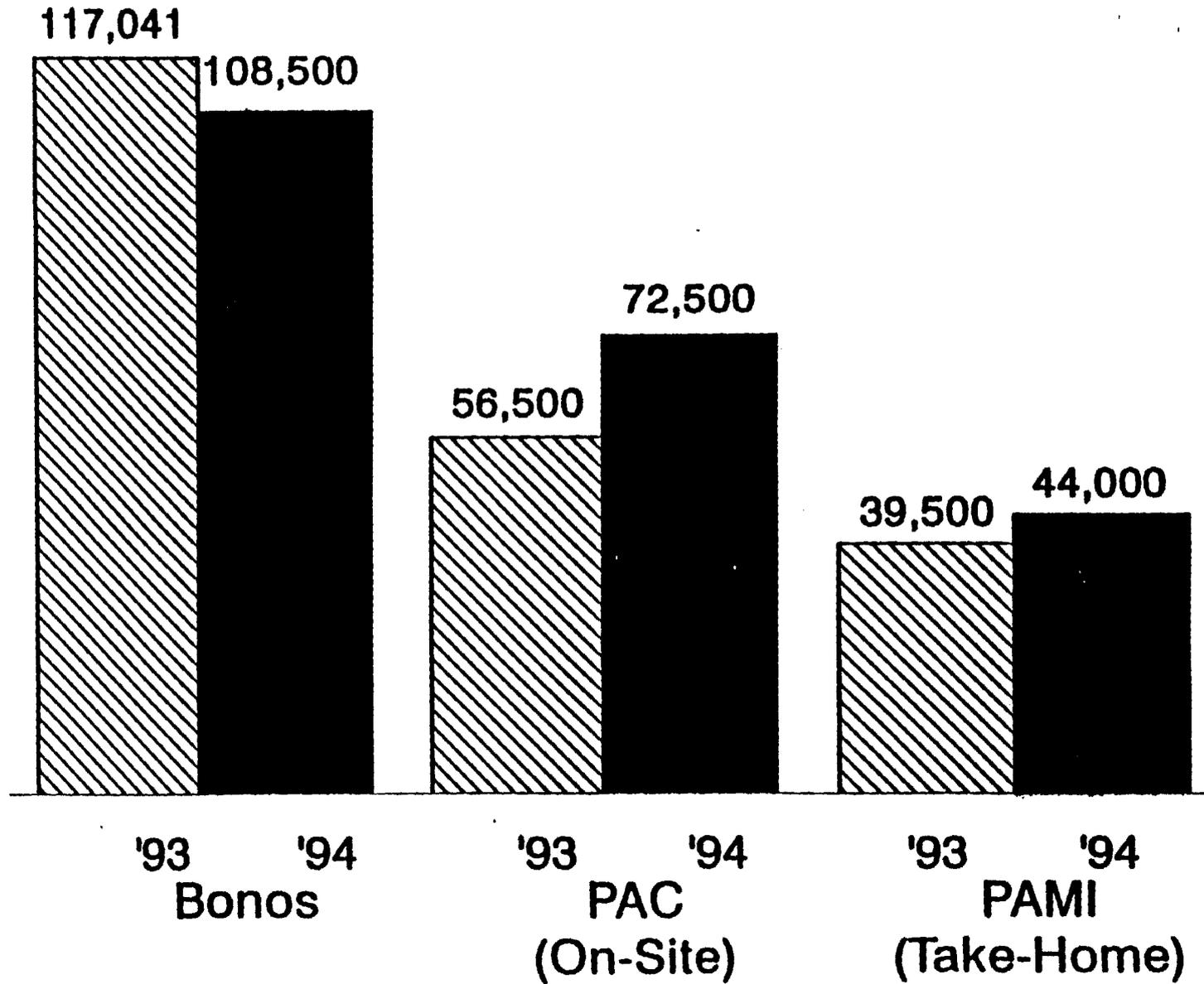


FIGURE 3

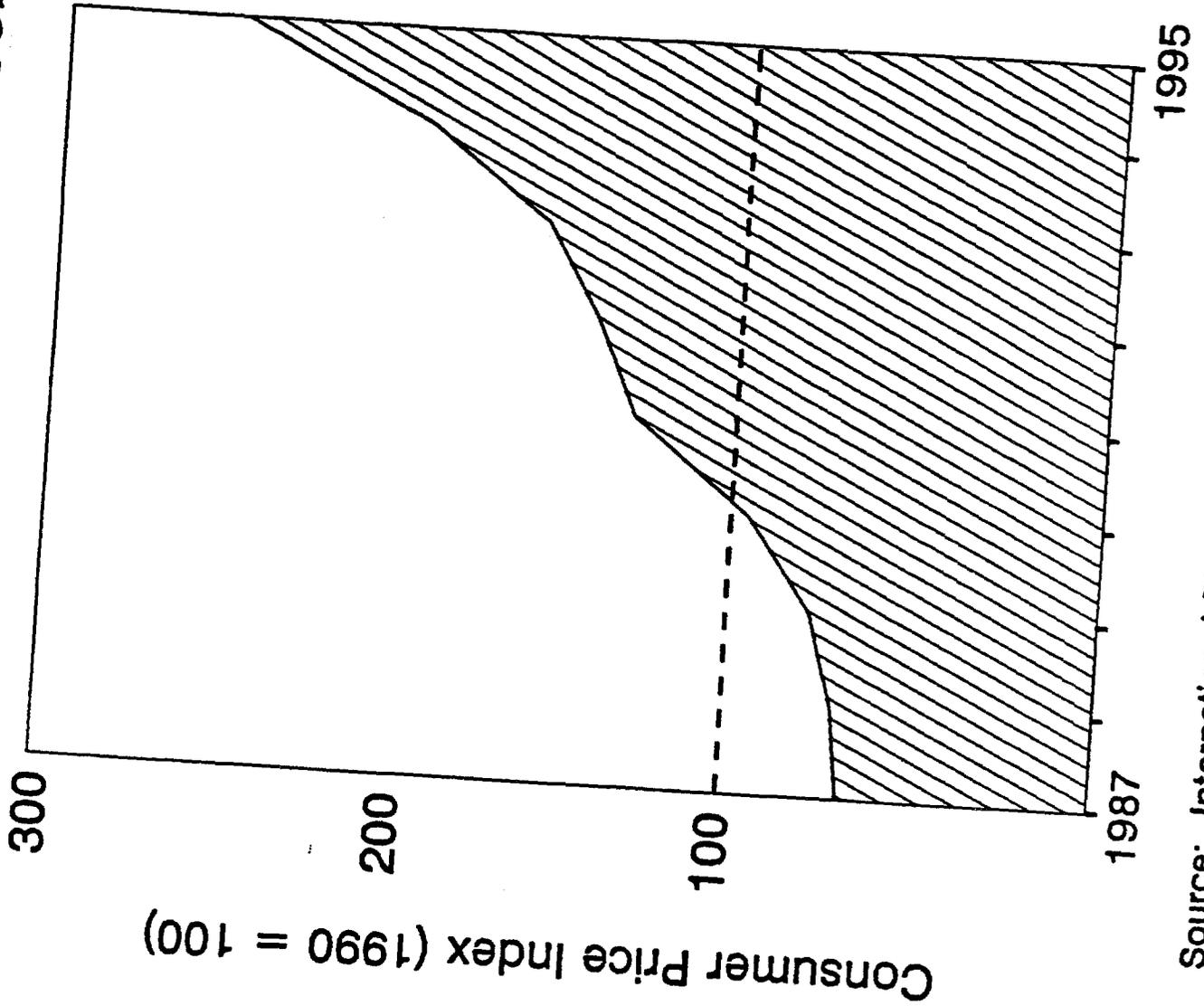
Honduras Food and Income Study: MCH Programs

Number of Program Beneficiaries



Honduras Consumer Prices

FIGURE 4



Source: International Financial Statistics, July 1995



Honduras Food and Income Study

Value of Benefits

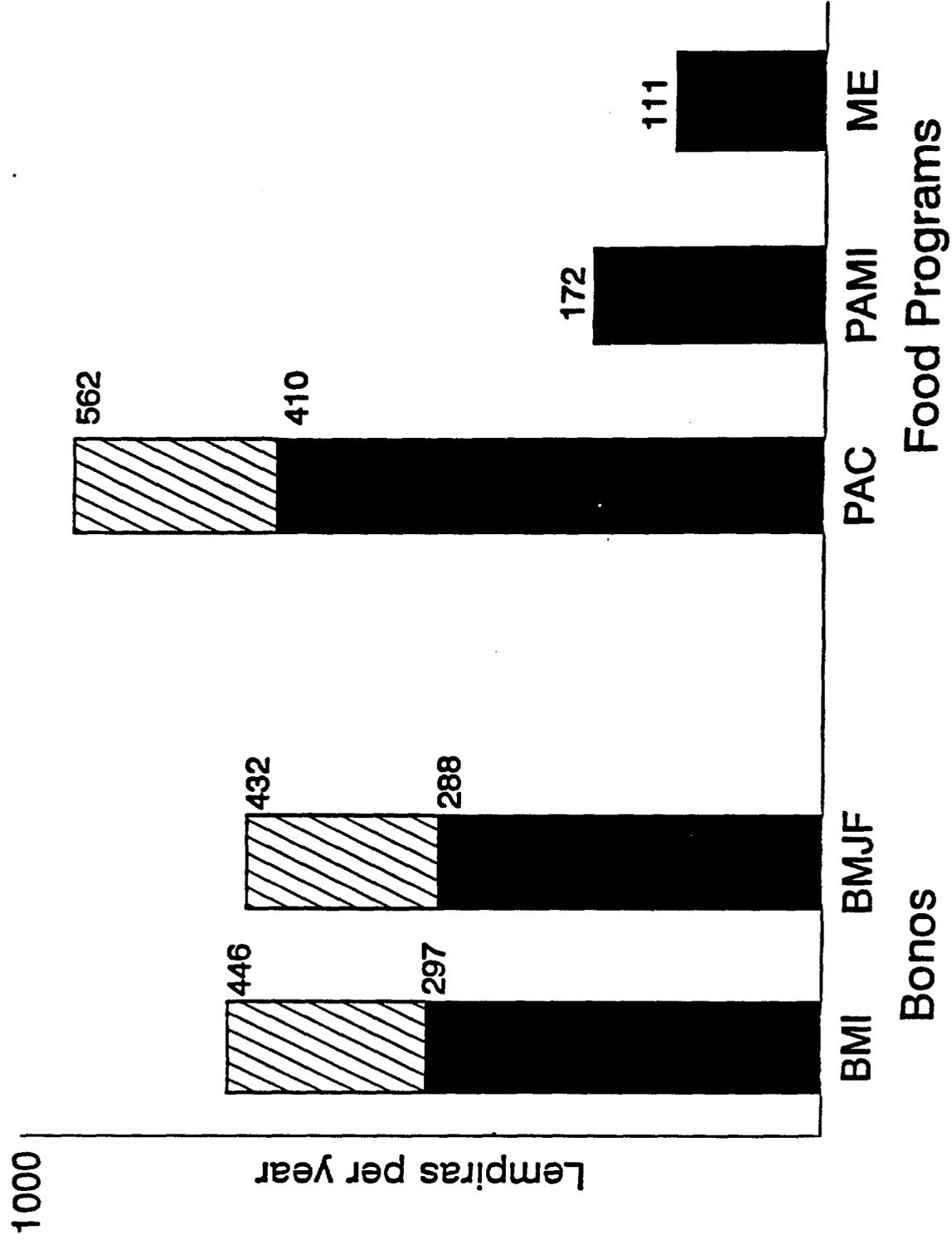
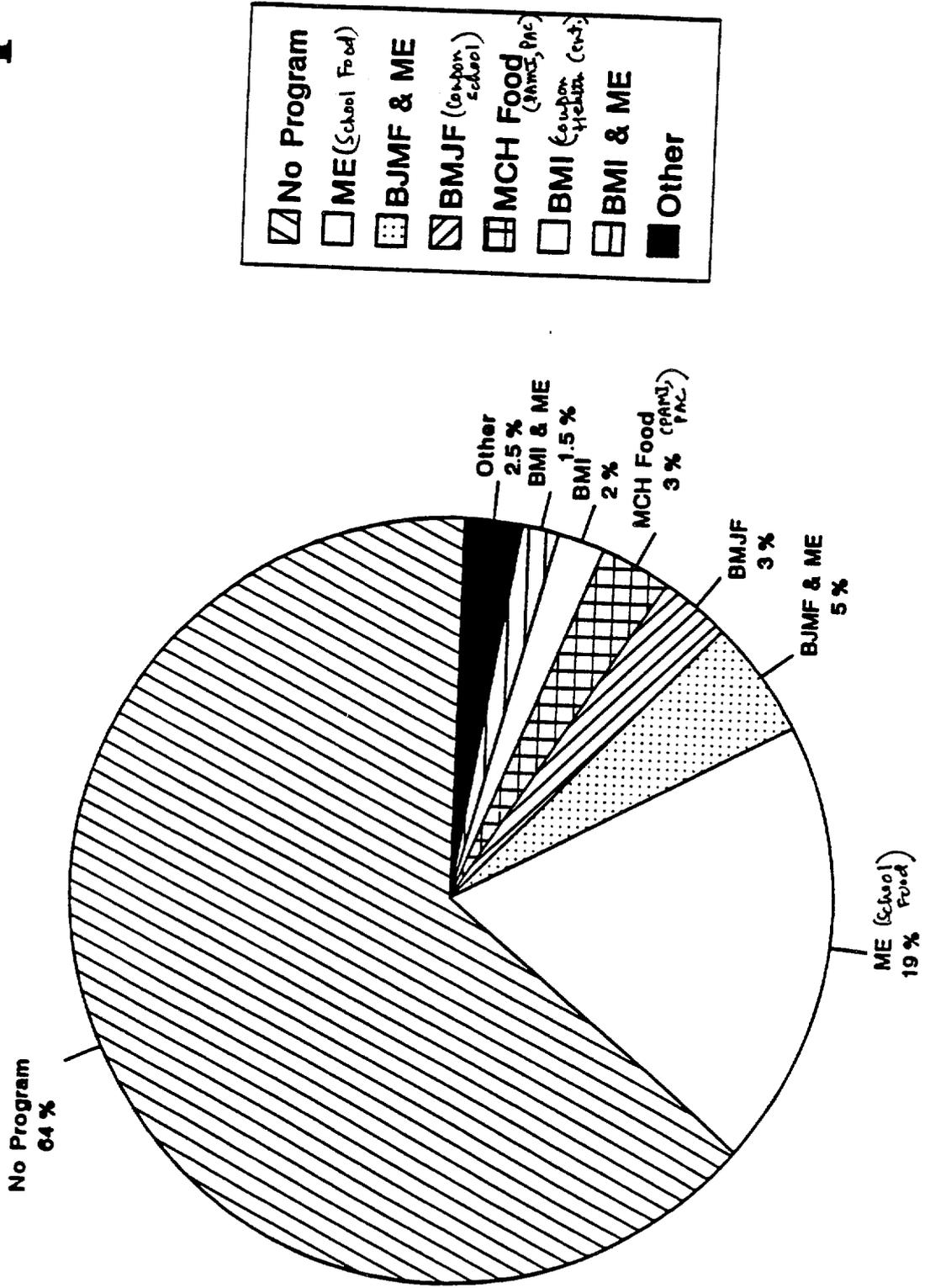


FIGURE 6

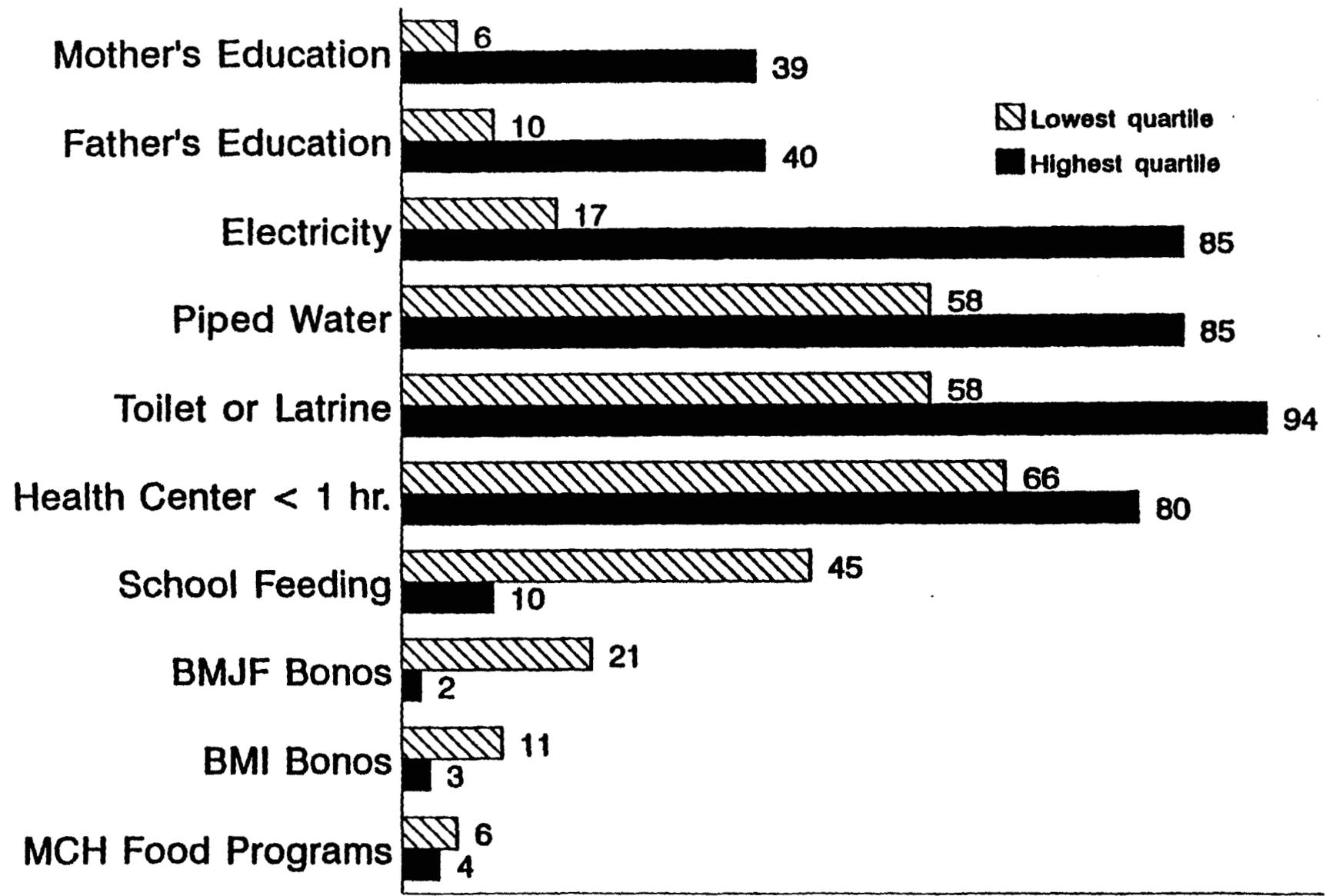
Honduras Food and Income Study

Honduras Food and Income Study Program Coverage and Overlap



Honduras Food and Income Study

Distribution of Public Services by Expenditure Quartile



Percent of Households, 1993/94

