

**Where Child Meets Survival: Healthy Start  
for Child Survival in Indonesia**

**Submitted to:  
BASICS Expert Consultation on Child Survival**

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Attachment 1 - Project Results by Objective, Lombok And Bali

Attachment 2 - Project Results by Objective, Sumbawa and Urban Mataram

# Where Child Meets Survival: Healthy Start for Child Survival in Indonesia

## I. Context

From a population of 205 million in Indonesia— now the world's fourth largest country— 236,000 infants die in their first year of life; many of these deaths occur in the first few weeks of life. Most births take place at home, often attended by a traditional birth attendant with little training. For most families there is little contact with formal health care services before the baby is six to eight weeks old. By this time many babies have either died or have become victims of an infectious disease.

This was the situation on the island of Lombok in Indonesia before the start of the Healthy Start for Child Survival (HSCS) project. Maternal and infant mortality rates were unacceptably high (750/100,000 live births and 110/1,000 live births) and among the highest in Indonesia. In Lombok, nearly half of all infant deaths occurred in the first eight weeks of life. Home births (over 90 percent of all births) were attended by traditional birth attendants. Neonatal tetanus rates were higher than in other parts of Indonesia. Babies were not breastfed immediately, and many mothers gave early solid foods which could harm the newborn's digestive system, subsequently causing diarrhea, and all too frequently, death. Hepatitis B (HB) infection early in life was highly prevalent, a good deal of it transmitted from mother to child.

In addition, babies were susceptible to dying from diarrhea and acute respiratory infections, aggravated by vitamin and other micronutrient deficiencies. The first time a baby was seen by a trained health provider was when the mother would take her baby to the first health center visit at six to eight weeks of age or even later. Tradition prohibits taking a newborn out of the home for the first 40 days of life. Routine preventive health care services offered little for newborns and their mothers.

The project has been located in Lombok and Sumbawa, Nusa Tenggara Barat (NTB) province, and in Tabanan district, Bali. The population of Lombok is 2,500,000 and is primarily Muslim. The population of Sumbawa is 970,000, with a total land area that is bigger than Bali and Lombok combined, resulting in much lower population density. The population of Tabanan district, Bali is 367,660 and is primarily Hindu.

## II. Program Description

**Goal:** Healthy Start's goal was to improve maternal health and child survival in Indonesia by:

- strengthening Lombok's existing birth-centered system by delivering preventive-health services to postpartum women and infants at or within one week of birth, and

- replicating the birth-centered service-delivery approach in an Indonesian location that represents the government's new model of having trained midwives—rather than TBAs—deliver infants in the home.

*Objectives:* The project objectives were to:

- increase mothers' and infants' immunization coverage;
- increase the proportion of women and, thus, the number of infants, protected against tetanus;
- improve infants' and postpartum women's iron, iodine, and vitamin A status;
- increase the proportion of women exclusively breastfeeding immediately after birth;
- increase the proportion of women continuing to breastfeed infants during episodes of diarrhea and fever; and
- improve cord care practices of TBAs and midwives.

The key elements of the project were:

- community-based registration system for pregnancies, births, and child deaths
- integrated preventive health interventions
- active outreach to newborns in the home

In the Healthy Start project, the birth of a baby is the focal point for preventive interventions. During the antenatal period village volunteers identify pregnant women and urge them to attend the antenatal care sessions at the village health centers. TBAs are taught hygienic delivery practices and provided with equipment to facilitate this. A system of weighing babies at birth and caring for these of low birthweight has been established. Immediately postpartum, the trained midwife visits the mother and newborn baby in the home. Mothers are given a tetanus toxoid vaccination, a vitamin A capsule, iodine capsules, and a month's supply of iron tablets. The baby is given the first hepatitis B immunization and the first dose of oral polio vaccine. Mothers are taught about breastfeeding and good hygiene. Bars of soap are given to reinforce this message. Mothers are encouraged to take the baby for follow-up immunization in the health center, and information is given about the availability of family planning services.

The core of the integrated approach used in HSCS is the delivery of health care services in the home at the time of birth. This originated with the Hepatitis B Model Immunization Program established on Lombok in 1987 by the MOH (Ministry of Health) with technical support from PATH (Program for Appropriate Technology in Health)/the International Task Force on Hepatitis B Immunization. This program demonstrated that it was feasible to give the first dose of HB vaccine to newborn babies in the home within a week of birth. This was important in a country such as Indonesia where 25 percent of HB transmission occurs perinatally (transmission of the virus from mother to infant at birth). The model program demonstrated that home visits were not only feasible, but they offered a unique opportunity for early contact with families that could be built upon for the provision of complementary services and education.

In 1986, the government of Indonesia (GOI) established several new community-based service delivery models to decentralize health services from the sub-district level community health center (*puskesmas*) to the village level sub-health center (*pustu*) and the integrated health post (*posyandu*). This included training a new category of worker called the *bidan di desa* (village midwife) to eventually replace the existing *dukun bayi* (traditional birth attendant). The Healthy Start program supports this GOI transition to a decentralized *bidan di desa* system.

To make outreach services possible in the HB Model Immunization Program, it was necessary to create a registry of pregnant women and a system of birth notification. The birth reports now trigger home visits by the village midwife. Because TBAs in Indonesia are not permitted to give injections and the majority of births are attended by TBAs, it is necessary to rely on midwives to make the follow-up home visits.

In 1990, the USAID/BHR/PVC-funded child survival program, Child Survival–Plus Two (CS-P2) was designed by the MOH and PATH/International Task Force using the active outreach visit as a base and adding many of the maternal and newborn preventive services and health education elements present in HSCS. This expanded model program brought a central focus to maternal and newborn services and tied together several interventions in an integrated "birth-centered" manner.

In July 1993, AusAID funded the HSCS program in Lombok and in the Tabanan district of Bali. This allowed further expansion and enhancement of the birth-centered model of service delivery. Collaborators were the Macfarlane Burnet Centre for Medical Research (MBC) of Melbourne, Australia, PATH/International Task Force on HB Immunization, and the Indonesian MOH at the national and provincial levels, with assistance from YKSSI (Yayasan Keluarga Sehat Sejahtera Indonesia), a local NGO. This project funded extension of the model to 100 percent of the villages in Lombok by 1996. During this time, the record keeping system was simplified and the infant verbal autopsy system was expanded and revised. Iodine supplementation was provided to pregnant women and newborns in areas of iodine deficiency. To demonstrate how HSCS could more fully utilize the government village midwife system, the model program was extended to Tabanan District in Bali, where a large proportion of deliveries were attended by these workers. In all sites, wherever possible, the project supports the function of the village birthing center (*polindes*), a national initiative to give the village midwife a physical presence in the village where she can provide antenatal and obstetric care.

In 1995, the USAID-funded HSCS project was launched on Sumbawa and Lombok islands. It sought to further refine the model while demonstrating its replicability in Sumbawa and its appropriateness for use in an urban setting in Lombok. Sumbawa presented the challenge of replicating the entire HSCS birth-centered service delivery model, including institution of the home visits within a week of birth. Sumbawa also represented a much more widely dispersed population, including transmigration villages.

The project was implemented in the following phases:

- Phase one commenced in 1993 working to test and refine strategies in 18 villages in Lombok and 30 villages in Bali.
- In Phase two, the second project year, HSCS expanded to work in a total of 87 rural villages in Lombok, 16 urban villages in Mataram, and in all 110 villages in Bali.
- In Phase three, all remaining rural sub-districts in Lombok were trained at the *puskesmas* level with a focus on villages with *bidan di desa*. Activities in Bali continued in 110 villages.
- In Phase four, project activities were replicated to villages in all three districts of Sumbawa and to remaining urban villages in Mataram, Lombok.
- In Phase five, project activities were expanded to 23 new villages in Sumbawa district and meetings focused on improving hospital/clinic/NGO involvement in urban Mataram.

Project cofunding was received in 1997 from the Family Planning Program Fund at PATH to design and conduct a pilot program in strengthening early antenatal care and family planning. In Indonesia, pregnant women typically do not receive their first antenatal check-up until late in their pregnancy. To help women receive antenatal care earlier in their pregnancies and, thus, increase the quality of antenatal care, antenatal home visits were introduced in eight villages in the Alas *puskesmas* of Sumbawa. Village midwives and village family planning workers worked together to identify pregnancies as early as possible and to visit these women in their homes. The teams explained the *posyandu* system and stressed the importance of monthly antenatal visits. The woman was encouraged to attend the upcoming *posyandu* immunization session.

### III. Results

#### A. Health Impact

In order to evaluate the health impact of the HSCS project, several tools were employed including the verbal autopsy analysis and **baseline and final KAP (Knowledge, Attitude, and Practice)/coverage surveys**. The same KAP/coverage survey questionnaire was used in the 18 core villages in Lombok and Sumbawa with independent sampling of hamlets within those villages. The standard 30-cluster sampling method developed by WHO for immunization-coverage surveys was used. Women who had given birth within the preceding two years were included.

Statistically significant outcomes between the Lombok baseline and final KAP/coverage surveys:

- reductions in infant deaths
- reduced proportion of low birthweight infants
- decrease in mothers receiving no antenatal care
- increase in mothers attending four or more antenatal visits
- increased proportion of women taking iron tablets during pregnancy

- increased percentage of births attended by a midwife or nurse
- increased proportion of mothers in iodine-deficient areas receiving iodine supplementation.

After just 18 months of HSCS activities on Sumbawa Island the KAP/coverage survey showed the following outcomes:

- mothers receiving complete antenatal tetanus vaccine coverage increased from 15 percent to 76 percent
- babies weighed at birth increased from 29 percent to 81percent
- fully immunized children increased from 11 percent to 84 percent.

Other key results from the baseline and final KAP and surveys in Sumbawa and Lombok are highlighted below. See Attachments 1 and 2 for results by objective.

### Sumbawa and Urban Mataram KAP Summaries

<b>Intervention</b>	<b>Sumbawa</b>	<b>Mataram</b>
	Baseline/Final	Baseline/Final
<b>Nutrition</b>		
Pregnant women correctly take iron tablets	37% / 56%	56% / 63%
Women receive iron tablets postpartum	1% / 87%	14% / 41%
Women receive postpartum dose of vitamin A	1% / 87%	13% / 30%
Infants exclusively breastfed until at least four months	42% / 54%	67% / 69%
<b>Antenatal Care</b>		
Women attend at least four ANC sessions	41% / 63%	75% / 78%
<b>Perinatal Care</b>		
Infants receive clean cord care	62% / 88%	47% / 78%
Babies checked for low birth weight	29% / 81%	59% / 84%
<b>Immunization</b>		
Pregnant women receive at least two doses TT	15% / 76%	26% / 31%
Postpartum women receive TT	1% / 79%	13% / 29%
Fully immunized children	11% / 84%	56% / 76%
Infants receive HB1 within seven days of birth	3% / 90%	24% / 51%

### Lombok KAP Summaries

	<b>1993</b>	<b>1996</b>
	Baseline	Final
Mothers receiving two doses of TT during pregnancy	47%	73%
Mother taking iron tablets during pregnancy for four weeks or more	15%	63%
<b>Birth</b>		
Mean number of births per mother	3.7	3.1*
Mean number of infant deaths per mother	0.73	0.55*
Low birthweight babies (2.5kg)	5%	2%
<b>Breastfeeding</b>		
Infants zero to four months exclusively breastfed	42%	58%
<b>Immunization</b>		
Babies receiving HB1 within seven days of birth	71%	84%
<b>Nutrition</b>		
Postpartum mothers in iodine-deficient areas receiving iodine capsule	3%	66%
Babies under 12 months receiving vitamin A with measles vaccine	33%	83%

*\*These results are highly significant statistically*

*Verbal autopsy:* The purpose of the verbal autopsy is to obtain information on deaths occurring among infants in the project areas. Verbal autopsy data were collected in rural and urban Lombok and Sumbawa from March 1995 through December 1996. A total of 543 questionnaires were received and analyzed. The questionnaire used was a modification of the those designed by the Society for Education Action and Research in Community Health (SEARCH) team in India and by WHO. It consists of a series of modules, each of which deal with the major causes of infant death in Indonesia. A certain number of criteria must be fulfilled for each module in order to make a diagnosis/diagnoses. More than one cause of death may be possible. The questions are asked by midwives/nurses trained in verbal autopsy methodology of the person who was closest to the infant before death, usually the mother.

- The verbal autopsy analysis shows a reduction from 20 - 25 percent to less than five percent in the number of infant deaths due to tetanus over a three-year period. This is likely due to a combination of better hygiene at time of delivery and increased maternal coverage with tetanus toxoid vaccine.
- The main cause of death was acute respiratory infections (58 percent). Perinatal causes including stillbirths, low birthweight, prematurity, and complications of delivery accounted for an addition 14 percent of deaths.
- Currently, acute respiratory infections have overtaken diarrheal disease in frequency as the leading cause of child deaths.
- The reduction in deaths from diarrhea can probably be attributed to active promotion of exclusive early breastfeeding and improved community utilization of the health care system.
- Thirty percent of all infant deaths occurred in the first month of life.
- Forty-two percent of neonatal deaths occurred in the first two days of life.
- Twenty percent of deaths occurred in infants of low birth weight (including premature infants).
- Only 15 percent of infants who died were seen by a doctor before death and only 13 percent by a *bidan di desa*.
- The prevalence of goiter (thyroid enlargement, usually indicating iodine deficiency) was mapped throughout Lombok and defined accurately—for the first time—the areas where iodine supplementation should be targeted.

## **B. Policy**

Hepatitis B vaccination of all infants at birth and postnatal home visits by midwives to all infants and their mothers was adopted as national policy by the Indonesian MOH before the HSCS project concluded. Healthy Start and the projects which preceded it are providing a model and a stimulus for the entire country.

## **C. Sustainability**

One of the most significant indications of the potential for sustaining the HSCS project has been its adoption into routine health services throughout NTB province—even before the project's formal conclusion. Project activities were incorporated into routine practice

throughout Lombok in 1996 when the Health Department in NTB Province instructed all District Health Services to sustain the HSCS system using local and central funding. The Health Department in Bali has stated its commitment to both sustain the HSCS system in Tabanan district and to replicate it in Karangasem Regency, a more inaccessible district of east Bali, prior to expanding HSCS services throughout the island. The HSCS birth-centered service delivery approach is continuing not only in Lombok and Bali with local government funds, but it has also been extended throughout Sumbawa with World Bank funds and has formed the basis for the recently awarded (AusAID-supported) Healthy Mothers Healthy Babies project in SE Sulawesi and North Maluku provinces.

Because the whole project has been implemented by staff from the Indonesian Ministry of Health, the work has continued after project staff and funding have been withdrawn. The HSCS National Team has presented its own set of final replication documents to the MOH with a request to replicate the HSCS program in the 26 other provinces of Indonesia. An interpersonal communication and counseling video developed by the companion, AusAID-funded Healthy Start project has already been distributed to all provinces.

#### **D. Cost-Effectiveness**

- A cost-effectiveness analysis undertaken in 1996 showed that HB immunization, in general, is highly cost-effective and desirable, whether it is delivered at home or in an integrated health post (*posyandu*) setting. Home delivery is more cost-effective than *posyandu* delivery.
- The HB-filled UniJect™ syringe was the most cost-effective method for delivering a birth dose of HB vaccine during a home visit as compared to a disposable syringe and multi-dose vial, or SoloShot™ with a single-dose vial.

#### **E. Pilot Projects**

- In a field trial among 100 midwives in Bali and Lombok, the UniJect™ prefilled, nonreusable injection device was stored in midwives' homes for up to one month and used outside the standard cold chain—a strategy that could extend immunization coverage to underserved populations. Use of UniJect™ out of the cold chain simplified cold chain logistics, minimized vaccine wastage, and facilitated speed and efficiency during home visits. The comparison of seroconversion among HB-filled UniJect™ stored both in and out of the cold chain with a control group injected with HB vaccine using a standard needle and syringe showed 97 percent of children enrolled in the serosurvey had detectable HB antibody.
- The village midwife-family planning worker teams in the Sumbawa pilot family planning integration project reported many advantages to these early antenatal home visits. They felt it made women more open-minded about antenatal care, and the relaxed environment of home visits allowed women to ask more questions about their pregnancies than is normally possible at the busy *posyandu*. First trimester antenatal care increased substantially in the eight project villages. The program tripled the rate of women

receiving antenatal care during their first trimester. Those receiving permanent contraceptive methods, IUD, and Norplant<sup>®</sup>, increased substantially. The local chapter of the government family planning office has identified internal funds to continue and expand the program in Sumbawa.

## **F. Documentation**

Several brochures and articles have been, or will be, published, both in English and Bahasa Indonesia, describing the overall HSCS model and achievements. A color brochure in English and Bahasa Indonesia entitled *A Healthy Start for Indonesian Children* has been widely distributed internationally and within Indonesia. Text and photographs from this brochure are in PATH's web site. Draft manuscripts describing the complete HSCS model program and the verbal autopsy system will be submitted for publication in international health journals. With funding from AusAID and USAID/HealthTech, two articles on the single-use injection device, UniJect<sup>™</sup>, have been written. One has been accepted for publication by the *WHO Bulletin*; the second has recently been submitted to *The Lancet*. The first issue of *Reproductive Health Integration Issues* published by Initiatives, Inc., included an article on the incorporation of family planning into the Healthy Start project in Sumbawa.

## **IV. Critical Programmatic Approaches and Methodologies**

### **A. Replication and Integration**

#### **1. Replication as a goal**

A stated goal of the HSCS project was to replicate the project in one additional area and provide sufficient information and experience to allow the MOH to make a decision on the birth-centered service delivery approach. Initially, the project focused on **piloting, evaluating, and refining** specific preventive interventions. All activities were directed toward the refinement of the approach in order to make it sustainable and replicable within Indonesia. Key elements of the project design were:

- involvement of national decision-makers
- regular review meetings with representatives from the national and provincial levels
- evaluation mechanisms
- participation in national-level workshops and conferences on maternal-child health, immunization and nutrition.
- adaptation and implementation of the program in diverse geographic and socioeconomic settings
- phasing
- documenting the project and disseminating information
- submitting papers for publication in scientific journals
- linking with an international group of scientific experts in HB immunization
- participation at international donor agency meetings

## 2. Build on existing infrastructure

A number of specific activities were undertaken to promote the continuation and replication of HSCS:

- **Use the existing MOH infrastructure.** This strategy aimed at assuring continuation of the birth-centered approach beyond project completion. The project had strong involvement of key decision-makers from the outset, ensuring that lessons learned would be utilized in national health policy development. An Indonesian steering committee was established at the national and provincial levels to coordinate planning, implementation, and evaluation of the projects. The Chairperson of the National Team was the Directorate for Epidemiology and Immunization, with other members representing the Minister's expert staff on Epidemiology, the Directorate for Family Health Improvement, and the Center for Health Laboratories. The National Team was represented at semi-annual and annual review meetings and had routine debriefings from project staff in Jakarta and Lombok. National Team members were critical in influencing the national policy change which emerged during the life of Healthy Start. One member of the National Team played a significant role in that he worked for the MOH but was also a part-time consultant to PATH/Jakarta. This created a certain tension that was not easy at times for the HSCS staff who were not in Jakarta to reconcile. However, his involvement has been a factor in the project's success. He was able to provide the National Team with an ongoing synthesis and reminder of the HSCS achievements and challenges.
- **Support and enhance MOH policies.** The project supported the MOH policy to decentralize health services to the periphery; specifically, the policy of placing a village midwife at the village-level sub-health center to assist with antenatal care and with births. The continued success of the HSCS model is reliant on the continued development of the *bidan di desa* system. There is every reason to believe that the government will achieve its goal of placing a *bidan* in every village. Various components of the HSCS model could be incorporated into the curriculum for *bidan* training, which would have the effect of accelerating the replication of the home visit model to other parts of Indonesia.
- **MOH documentation.** The MOH, with assistance from the project team, documented the HSCS project as a resource that can be used by other Indonesian provinces to adapt the model. This process was aided by conducting a national level workshop in May 1996 that presented the findings of the project to national and provincial decision makers. HSCS staff attended other national and provincial level meetings that were appropriate to the project such as the Safe Motherhood Coordinating Committee meetings and National Immunization meetings. PATH plans to seek funding to carry out a post-project evaluation two years after the project's end.

## 3. Support existing structures with new systems

**Home visit:** HSCS is built upon the reality that 90 percent of births in Indonesia take place in the home and that most of these babies are not seen by trained health workers until they are 6-8 weeks old. The HSCS program fills this gap by using the home visit, within days of

birth, to provide preventive perinatal health services. Contact with a family during pregnancy and birth establishes a pattern of active interaction between families, TBAs, and formal health care providers. Having the village midwife in the home of a postpartum woman personalizes the health services and engenders a lasting relationship. Because the services are more convenient for families, compliance with follow-up activities is more likely.

**Birth-centered:** Linking project activities to the event of birth has been easily understood and accepted at all levels. Program interventions reach backward in time to include pregnancy detection and early referral for antenatal care, and reach forward in time to include birth, postpartum care, and follow-up for well-child immunizations and well-child care. The birth focus for service delivery is a win-win approach. It is popular with the postpartum women who see the convenience and benefit of having critical newborn health services brought to their homes. It is preferred by the TBAs, who have received additional training, supplies, and support from the midwives. The project acknowledged the important community role the TBA plays, not only in assisting in birthing, but also in performing household chores for the new mother's family. The midwives, often young recruits who are new to the community, benefited from having the trusted TBA as their conduit to the pregnant and postpartum women who will eventually be the source of their income. And the formal health care system saw critical health services reaching a mother and infant at a time when infants were most vulnerable to disease.

**Community-based registration of pregnancies, births, and deaths:** Records of pregnant women, births, infant deaths, and immunization coverage are maintained by the village midwives. The information for these records is provided by a network of community helpers. Appropriate incentives were used to enlist the assistance of the community helpers. TBAs were given alcohol and cotton when they report births – tools that help them perform the community work more effectively. One of these is a village volunteer member of the Indonesian Family Welfare Movement (PKK), which operates from the national to the sub-village level in Indonesia and is chaired by the wife of the local government administrator or other prominent community member. The traditional hamlet chiefs are also used to transmit health information on pregnancies, births, and deaths to the midwives. Having this information collected at the village level raised the awareness of key community leaders, both formal and informal, as to the health status of their community.

**Integration of vertical programs:** In the HSCS model, integrated training of health workers, community leaders, and volunteers replace separate, disease-specific vertical programs—EPI, Nutrition, MCH, Health Education/Promotion, and Family Planning—with the focus on the events of pregnancy and birth. It adds cohesion to the health services when the focus is on the person rather than on individual services.

## **B. Relationships**

Building relationships may have been one of the strongest approaches and impacts of HSCS. Digging a tunnel of light into the closed traditional project communities is all about establishing relationships of trust and understanding to help people feel comfortable trying something new. HSCS excels at this. Relationships between TBA and bidan allows the bidan

to enter the TBA's world and contacts. Relationships between bidans and community are established through the home visits and expand into future health care opportunities. Relationships between the bidan and her superiors at the *puskesmas* are enhanced through the empowered bidan's role in HSCS. Province to lower-level relationships are established through the training and supervisory system that forces them to work together. Finally, relationships among expatriate project team members, donors, and all the direct service levels are facilitated by the local steering committees and regular review process—we learn much that will be applied to future programs. All these relationships are what make HSCS work.

### **C. Training/Health Education**

The extensive training program developed for Healthy Start has been a cornerstone of the project. A strong training and retraining program was seen as a funding priority, particularly given the fairly rapid turnover of health center doctors. The training approach was revised to use a participatory training methodology and competency-based learning approach. A core of master trainers at the provincial level trained the district level trainers and were present at the majority of training sessions at the lower levels. Master trainers trained the sub-district level trainers, and the sub-district level trainers trained the village level trainers. This pyramid training structure has produced a large cadre of well-trained staff and administrators which has very likely contributed to the project's effectiveness.

The project produced a set of 22 training modules that were extensively revised and field-tested to make them generic enough to be easily used in other Indonesian provinces. An interpersonal communications and counseling training module was developed and then adapted to incorporate a training video produced by the Indonesian NGO, YKSSI. The video was subsequently distributed for use throughout Indonesia. A supervisor's checklist was also used to help improve the effectiveness of supervisory visits.

Regular retraining must be given a high priority for the quality of field activities to be maintained. The integrated approach to the initial round of training should be used, but in a more focused way, in order to meet the retraining needs of the participants. The thoroughness of the training is expected, however, to be one of the costs that is most difficult to sustain in its entirety.

Behavior change communication materials were developed using a participatory process to ensure appropriateness and comprehension. Local artists were used for all illustrations. Pamphlets were developed for the community volunteers in Bahasa Indonesia and Sasak, the language native to most of Lombok. Pamphlets were also developed on home care of low birthweight infants, personal hygiene, and breastfeeding. HSCS also used a set of sturdy, laminated color cards for village volunteers produced by the Provincial Governments of West and East Java and NTB and CARE Indonesia on basic health information.

The project evaluations, however, have faulted the number of health education messages given to the new mother during the perinatal home visit, particularly the referral to follow-up with family planning services. This contributed to a refinement to the pilot project

undertaken in Sumbawa, to have a six-week postpartum joint visit by the family planning worker and the village midwife.

## **D. Monitoring and Evaluation**

A number of tools were used to monitor and evaluate the project. These included:

- Health information systems (HIS)
- KAP/coverage surveys (baseline and final)
- Cost-effectiveness study on prefilled syringe
- Field evaluations of health technologies
- Ongoing monitoring and supervision
- Semi-annual and annual review meetings

### **1. Health Information System**

The HIS encompassed several different tracking systems:

- Vital events registration system (pregnancy, birth, and death detection and reporting)
- Verbal autopsy
- Monthly immunization forecasting and coverage
- Collection of routine data on interventions

The **vital event registration system** was introduced to encourage community-based recording of pregnancies, births, and maternal and child deaths, thereby improving overall project management. It has been made possible by the cooperation of community volunteers, traditional birth attendants, hamlet and village leaders, and health workers. The system was refined with input from the MOH at all levels from village to province. This system is critical to the effectiveness of the HSCS model, as it forms the basis for increasing coverage of preventive health services at the time they have the greatest impact.

A **verbal autopsy** system for infant deaths was introduced in Lombok during HSCS. Verbal autopsy results can be used to: assess the major causes of infant deaths; study age and sex patterns of mortality; assess the impact of project and other health interventions on mortality; help make decisions concerning future health intervention priorities.

There was close coordination with the National Health Statistics Office to ensure that the revised HIS met their specifications and to facilitate the process of replication of this activity to other sites in Indonesia. The **routine data recording and reporting systems** were simplified and unified, resulting in less administrative burden for the service providers. Simplified case definitions were produced for the verbal autopsy materials. A lifetime history of maternal TT and micronutrient supplementation has been produced and introduced. A seminar for local health officials was conducted in order to provide them with the strategies and skills needed to use this routinely collected data to set measurable, relevant, and

achievable program targets; to identify problem areas; to monitor program activities; and to provide local feedback in a meaningful form.

## **2. Goiter survey**

Because of the widespread problem of iodine deficiency, the HSCS program undertook a goiter survey in 1994 to determine the goiter endemic areas of Lombok Island. Although not part of the ongoing HIS, the iodine map has provided a tool for monitoring future changes in iodine deficiency in Lombok. In the goiter-endemic areas, women attending antenatal sessions, postpartum women, and newborn infants are given a capsule of iodized oil to prevent the physical and neurological damage caused by iodine deficiency disorder. By selecting for supplementation only those areas with documented iodine deficiency, the government is able to target limited resources toward the most vulnerable populations.

## **3. KAP/coverage survey**

A clear indicator of the program's success was the dramatic increase in basic health coverage as evidenced by the KAP/coverage survey results. These increases were made in programs that had been receiving focused attention from the MOH for several years prior to HSCS. That HSCS could improve coverage in these areas so quickly has helped convince the government policy makers that HSCS is highly appropriate and effective for Indonesia.

## **4. Cost-effectiveness analysis**

A cost-effectiveness analysis undertaken in 1996 showed that immunization with HB vaccine is highly cost-effective and desirable, whether it is delivered at home or in an integrated health post setting. Home delivery of vaccine was shown to be more cost-effective than health post delivery.

## **5. Evaluation of health technologies**

Because of the well-established relationships in Indonesia and the long-term nature of the Healthy Start project in Lombok, a variety of field evaluations could be undertaken. Several new health technologies were field-tested. These included:

*Birthweigh scale:* A simple, color-coded baby-weighing system was provided to traditional birth attendants in the Healthy Start project. The yellow and blue color codes on the scale indicate whether a child weighs under or over 2,500 grams, and correspond to tear-off reporting cards which are used by the non-literate TBAs to report the birth. The scale allowed a triage of health services and personnel to the low birthweight newborns, those at greatest risk for further health complications. This has allowed for better screening and management of low birthweight babies. There has been a recent suggestion that simple birthweigh scales may provide a useful means of evaluating the effectiveness of nutritional interventions during pregnancy.

Outreach syringe: UniJect™ field trial results from the Healthy Start project being published in several international journals will help to shape immunization practices internationally.

Several other health technologies were evaluated: pretreated strips to detect protein in urine and several ARI timers and counter timers. Although these health technologies were not adopted by the MOH into routine use, the evaluations have provided information on the acceptability, appropriateness, and design of these diagnostic tools. The evaluation results of the proteinuria strips have informed the development of other health technologies and may play a part in shaping best practices or management of hypertensive diseases of pregnancy. The ARI timer results were shared with UNICEF to assist in their deliberations on improving ARI diagnostics and may also come into play with the introduction of ARI vaccines.

## **6. Ongoing monitoring and supervision**

Ongoing monitoring and supervision has been an essential component of integrating the program elements into routine MOH practice. MOH staff involved with this project at the peripheral levels were busy with their routine work. Focusing their attention on the effective management and implementation of another project, even if it was being integrated into their own systems, was time-consuming and was something that needed to be consistently reinforced at the provincial level. The principal investigator of the project at the provincial level was extremely knowledgeable and supportive of the project and was willing to use his authority to reinforce the importance of routine supervisory visits. Transportation costs for MOH supervisory visits was paid for by the project, as was customary for other MOH supervision. This did not cover time or per diem, just the cost of transportation. Each of these visits, which were often conducted with one of two members of the project staff, acted as a refresher training in key project elements. It appears now that the project has ended that supervision takes place, but less frequently.

## **V. Specific Factors Contributing to Healthy Start's Success**

### **A. Strong collaborations**

**Strong base of collaboration:** HSCS has been part of a series of ongoing collaborations in Lombok, beginning with the hepatitis B model immunization program and extending to the current Hib (haemophilus infulenzae B) vaccine clinical trial. A solid base of respect had been established through PATH/Jakarta's relationships with the MOH prior to the Lombok model program. This positive relationship was strengthened and broadened by the involvement of the International Task Force on HB Immunization, a group of international experts on hepatitis B. Scientific study protocols were jointly developed for the HB model immunization program in Lombok by the Task Force, PATH, Indonesian MOH, Centers for Disease Control and Prevention, and in association with the sophisticated Indonesian research laboratory in Lombok, Laboratory Hepatika. This approach of having expatriates with recognized technical expertise interact with Indonesian counterparts at the highest levels to develop integrated, multifaceted programs to improve health care delivery has ensured the results would be taken seriously. It has also fostered a dependence on Indonesian skills and resources rather than reliance on a high level of external input. PATH, MBC (Melbourne and

Lombok), and the MOH continued this thorough, research-oriented approach in the HSCS project where innovations that were built in to the project could be evaluated and their effectiveness documented.

Project collaborators were competent, honest, and committed to the project goals. The expatriate project team had technical skills in tropical medicine, epidemiology, health information systems, training and health education, evaluation, project management, and financial administration. The project worked closely, especially on the KAP surveys, with an Indonesian NGO, YKSSI, which had familiarity and strong relationships in Lombok with the MOH and the community itself.

It was challenging to work with so many different groups: MOH (national and provincial), MBC, PATH (Lombok, Jakarta, Seattle), YKSSI (Lombok). The existence of a number of experts with similar expertise who represented several institutions made joint decision-making difficult at times. The introduction of electronic communication assisted in communications but didn't solve all the hurdles. The fact that the HB model immunization program in Lombok and CS-P2 had been highly successful and was making a difference created a bond among the organizations. In spite of their differences, all the team members were ultimately willing to pull together for a shared goal.

## **B. Consistent and flexible funding**

The HSCS project and its predecessor projects' ten-year time frame has been critical. The extended time period has not only allowed for interventions to be tried, evaluated, adapted, and revised and for results to be seen, but also has allowed for the formation of essential relationships with MOH collaborators at the national and provincial levels. Over the life of the project, the funders have been exceptionally flexible, allowing mid-stream changes and additions. The projects have been funded by the James S. McDonnell Foundation, AusAID, USAID/BHR/PVC, with field evaluation of health technologies through USAID's HealthTech project with pilot grant from PATH.

## **C. Working within a hierarchical system**

The project has benefited from working in a country that has a strong governmental hierarchy. It has meant that when someone in authority makes a request, it is generally followed. This applies at all levels. This has certainly contributed to the ability of the project to work in all 274 villages in Lombok and to expand so rapidly in the island of Sumbawa. Sumbawa also benefited from having a strong, experienced provincial management team including the master trainers. Two of the three district chiefs had worked on HSCS in Lombok, and so understood the program.

## **VI. Lessons about Successes and Failures**

**Be alert for opportunities:** In project review meetings before the end of the HB Model Immunization program, the team realized that by having shifted the location of service delivery, a tremendous opportunity had been created to add on a set of preventive, cost-

effective perinatal services during the home visit. Instead of just seeing the project in terms of an effective mechanism for HB vaccine delivery, the potential for making the home visit far more beneficial and cost-effective was utilized.

**Challenges of working with so many groups:** There were tensions and frustrations but this also led to broader exposure, inputs, technical and financial support, and ownership.

**Check out assumptions:** Had the original premise that it would be culturally unacceptable to immunize an infant in the home within a week of birth been accepted, there would be no HSCS project.

**Urban model required a different approach:** Urban settings provide a variety of alternatives for antenatal and child health. With so many health options it was more difficult to implement and evaluate the Healthy Start model. Private midwives were useful in conducting the birth interventions; however, physicians and hospitals were resistant to following the program guidelines. In addition, the typical urban breakdown in community links posed problems for the community-based reporting systems. The program achieved results in urban Mataram, but between already-high baseline coverage and the limited reach of the public health system, results were not as impressive as in the rural areas.

**Cultural differences:** The cultures and health systems in Lombok, Bali, and Sumbawa were each different. The program had to be adapted somewhat for each setting. Lombok presented the greatest challenges, including its IMR (infant mortality rate) of 110/1000 in 1990, which is one of the main reasons it was chosen as the primary project site. Project staff in Lombok have observed that its culture combines very strong traditional beliefs and an interpretation of Islam which is male dominated and not conducive to improving maternal and child health. Women tend not to be empowered or highly educated, making it difficult for them to care for their children in ways that may improve their health.

#### **HSCS relevance to other locations:**

Although Healthy Start clearly benefited from the relatively good primary health care system in Indonesia, the project was able to make a significant difference in areas where the IMR was the highest in the country, where coverage was poor, and where traditional cultural practices were not conducive to improved infant health. It is felt that the key approaches used in Healthy Start were what made the greatest difference, and that these approaches can be adapted and modified to be appropriate for other settings.

Key HSCS approaches:

- work with and through the agency which is providing the bulk of the public health services which, in the case of Indonesia, was the MOH, to ensure ownership and sustainability

- offer technical expertise in public health, epidemiology, HIS, training/behavior change communication, project management, health care financing, and other appropriate areas
- collaboration starting at the highest possible levels with those responsible for perinatal services (MCH, EPI, Nutrition, Health Education, Family Planning)
- examine systematically the needs in perinatal health programming
- design project around:
  - 1) community-based pregnancy, birth, and death registration
  - 2) community-based educators to motivate pregnant women to attend ANC
  - 3) active (home, community) postpartum outreach visits by TBAs and/or midwives
  - 4) integrated, preventive perinatal services
  
- actively and creatively identify resources and potential obstacles in a project area
- thoroughly explore assumptions about what will or will not work
- strengthen overall training and interpersonal communication/counseling skills
- reinforce supervision
- strengthen HIS
- build in evaluation tools
- document
- share information

## PROJECT RESULTS BY OBJECTIVE, LOMBOK AND BALI

### *OBJECTIVE 1: Improved micronutrient status of postpartum women and infants*

#### *Results:*

- Significantly more women (93 percent as opposed to 78 percent ) took iron tablets during their most recent pregnancy.
- Ninety-six percent of postpartum women had written evidence of receiving vitamin A after delivery.
- Eighty-two percent of infants received a dose of vitamin A (100,000 IU) around nine months of age, compared to only 33 percent in 1993.
- Of mothers living in villages of known iodine deficiency, 66 percent had documented evidence that they received an iodine capsule during the most recent pregnancy, compared to only three percent of respondents during the baseline survey.

### *OBJECTIVE 2: Increased coverage and on-time delivery of vaccinations to infants and women*

#### *Results:*

- The coverage of maternal TT immunization increased significantly from 47 percent in the baseline survey to 73 percent in 1996.
- The percentage of women receiving *no* TT doses has decreased significantly from 42 percent to 12 percent. During the same period, there has been a dramatic reduction in neonatal tetanus in Lombok. This is due to a combination of better hygiene at the time of delivery and high maternal coverage with TT vaccine.
- Coverage for each EPI vaccine has remained high. Delivery of HB1 and OPV1 within seven days of birth has improved, from 71 percent to 84 percent for HB1 and from 69 percent to 84 percent for OPV1.
- In 1996, only one percent of deaths were due to measles and 0.8 percent due to pertussis (whooping cough), reflecting high immunization coverage.

### *OBJECTIVE 3: Increased proportions of postpartum women immediately and exclusively breastfeeding*

#### *Results:*

- Almost 100 percent of mothers breastfed their babies.
- The proportion of infants who were exclusively breastfed from birth to four months of age went from 42 percent to 58 percent.
- Eighty-eight percent of women started breastfeeding within 24 hours of birth as compared to 77 percent previously.

*OBJECTIVE 4: Increase the proportion of women continuing to breastfeed their infants during episodes of diarrhea and fever*

*Results:*

- Deaths due to diarrhea were reduced from 9 percent in 1990 to 2.8 percent in 1996.
- Of the mothers whose children had a recent episode of diarrhea, only 8 percent gave the child less fluid during an episode of diarrhea, compared with 31 percent in 1993.
- There has been an encouraging reduction of more than 50 percent in the proportion of children receiving "antidiarrheal" medication and antibiotics, from 36 percent in 1993 to 17 percent in 1996.

*OBJECTIVE 5: Improved ability to monitor women's lifetime history of TT vaccinations and micronutrient supplements*

*Results:*

- A lifetime maternal TT card, being introduced nationally by the MOH, was distributed and used as part of HSCS.
- The percentage of women with health record cards at home increased from 19 percent to 55 percent
- The prevalence of goiter was mapped throughout Lombok and defined accurately—for the first time—the areas where iodine supplementation should be targeted.

*OBJECTIVE 6: Improve cord care practices of TBAs and midwives*

*Results:*

- The verbal autopsy analysis has shown a reduction in the proportion of infant deaths due to tetanus from 20 to 25 percent to less than five percent over a three-year period. This is likely due to a combination of better hygiene at the time of delivery and increased maternal coverage with tetanus toxoid vaccine.
- There has been no significant change in the instruments used for cutting the umbilical cord.

*OBJECTIVE 7: Demonstrated feasibility of having village midwives administer HB and TT vaccines in a pre-filled injection device*

*Results:*

- One hundred and ten midwives delivered approximately 10,000 doses of HB and TT vaccine with UniJect™ during the ten-month field study in Lombok and Bali.

- Fifteen of 23 midwives observed used UniJect™ properly 100 percent of the time. Accidental expulsion of a small amount of vaccine or improper injection angle were noted in 13 percent of observations.
- After several months, all 33 midwives surveyed preferred use of UniJect™ over a standard needle and syringe.

*OBJECTIVE 8: Evaluation of the protection provided by HB prefilled syringe compared to HB delivered by a standard needle and syringe*

*Results:*

- The recent study comparing seroconversion among HB-filled UniJect™ stored both in and out of the cold chain with a control group injected with HB vaccine and a standard needle and syringe showed that 97 percent of children enrolled in the serosurvey had detectable HB antibody. Of those vaccinated with UniJect™, 96.6 percent had detectable antibody as compared to 98.2 percent of those vaccinated with a standard needle and syringe.
- No significant differences were detected in geometric mean titer between any of the above comparison groups.

*OBJECTIVE 9: Operational impacts of using a prefilled injection device for HB and TT vaccination stored and used beyond the cold chain*

*Results:*

A recent study found that the use of UniJect™ beyond the cold chain simplified logistics, minimized vaccine wastage, and facilitated speed and efficiency during home visits.

*OBJECTIVE 10: Demonstration of a reduction in infrastructure costs by the birth-centered delivery of health interventions*

*Results:*

- A cost-effectiveness analysis undertaken in 1996 showed that HB immunization, in general, is highly cost-effective and desirable, whether it is delivered at home or in a *posyandu* setting. Home delivery is more cost-effective than *posyandu* delivery.
- When comparing home delivery of HB at birth with a disposable syringe and multi-dose vial, SoloShot™ with a single-dose vial, or HB-filled UniJect™, UniJect™ was the most cost-effective method for delivering a birth dose of HB vaccine and a dose of maternal TT during a home visit and also carries the least risk of cross-contamination.
- Although the health benefits from delivery of a postpartum dose of TT during the home visit are difficult to quantify, they are likely to be the same regardless of equipment used during the home visit. As the incremental cost of delivering a maternal TT dose during the home visit is lower when UniJect™ is used, UniJect™ syringes prefilled with TT are the most cost-effective option.

*OBJECTIVE 11: Improved community acceptance of trained midwives operating at the village sub-health center level*

*Results:*

- The percentage of births attended by a *bidan* or nurse increased from 8 percent to 20 percent.
- In 1996, 82 percent of women said they had been visited at home by either a nurse, vaccinator, *bidan*, or health staff from the *puskesmas/puskesmas pembantu* (sub-health center).

*OBJECTIVE 12: Sufficient information and experience for the Indonesian MOH to make a decision regarding replication of the birth-centered service delivery approach to at least one additional site*

*Results:*

- There has been a very recent policy shift by the Indonesian MOH to adopt at birth HB immunization nationwide as well as postnatal home visits to all infants and their mothers.
- The HSCS National Team is presenting its own set of final replication documents to the MOH with a request to replicate the HSCS program in the 25 other provinces of Indonesia.
- The Health Department in Bali has stated their commitment to sustaining the HSCS system in Tabanan district and to its replication in another more inaccessible district prior to expanding HSCS services throughout the island.

*OBJECTIVE 13: Sufficient cost-effectiveness information and experience for the Indonesian MOH to decide which interventions to replicate throughout the islands*

*Results:*

- The 1996 cost-effectiveness study conducted by economists Laura Bailey and Anna Wetterberg, and the 1995 study by the International Vaccine Institute (IVI) and PATH provided the Government of Indonesia with concrete information showing the cost-effectiveness of delivering HB in Indonesia. Furthermore, their analysis showed that home delivery of HB vaccine was more cost-effective than delivery at the *posyandu*.
- The emerging *bidan di desa* (midwife in the village) system is the most attractive strategy for delivering HB vaccine at birth.
- The cost-effectiveness analysis of the UniJect™ device with HB vaccine carried out by the IVI and PATH and the Bailey/Wetterberg analysis have shown that HB vaccine delivered in the home at birth in UniJect™ costs US\$63.27 per disability-adjusted life-year (DALY) as opposed to US\$75.96/DALY for HB delivered at the *posyandu*. According to a recent World Bank study, any intervention with a DALY of below US\$100 is considered an excellent investment in health.

- The Health Department in NTB Province has instructed all District Health Services to sustain the HSCS system using local and central funding.

*OBJECTIVE 14: Increased training skills in interpersonal communications and counseling*

*Results:*

- A video on interpersonal communication and counseling was developed by YKSSI and used in the Phase three training for HSCS field staff in Lombok. This video has also been distributed to all Indonesian provinces as well as other NGOs working in public health.
- The percentage of women attending four or more ANC sessions has significantly increased from 58 percent to 77 percent, an indication of increased motivation or information from *bidan di desa*, *dukun bayi*, and *kaders* about its importance.
- Further indications of improved IPC/C skills may be seen through health improvements in areas in which the primary intervention was health education such as in the decrease in mortality from diarrheal diseases; the reduction in mean numbers of births per mother from 3.7 to 3.1; and the increase in the percent of women breastfeeding within 24 hours of birth and women who exclusively breastfed for four months

*Areas for Future Work:*

On the basis of the final KAP survey and the verbal autopsy results, certain behaviors and practices stayed the same or did not improve significantly during the life of the project. These are areas that should continue to receive the attention of the MOH.

- The high proportion of infants dying from ARI would warrant a dedicated project.
- The percentage of pregnancies resulting in still births has remained the same. Thus, the project has been successful in reducing infant deaths but not stillbirths, and this strongly emphasizes that there is still a need for further strengthening of ANC services.
- The percentage of women applying potentially dangerous substances to the cord, such as rice, ash, salt/pepper and herbal medicine, has also remained high. In 1993, 36 percent reported that they used other substances in addition to or in place of alcohol, iodine, or mercurochrome. By 1996, this figure was still 30 percent. These findings show there is a need for more information and continuing training on cord care.
- The percentage of infants receiving something other than breast milk prior to the first breastfeed has decreased but remains high: 43 percent in 1993 vs. 37 percent in 1996. In Lombok, infants are often given something sweet to eat shortly after birth, e.g., honey, as part of the Muslim tradition; this may or may not be a health risk.
- There is scope for additional improvement in health education concerning weaning practices. In particular, messages about duration of exclusive breastfeeding and weaning foods need to be emphasized during antenatal counseling. Good counseling techniques (as opposed to simply giving information) should be reinforced with the *dukun* and *bidan*.
- There is a need to include traditional healers in any future health interventions and also to educate mothers on the early recognition and appropriate treatment of a sick child.

- Maternal TT coverage has improved; however, the implementation of the new TT card could be improved. As coverage of women of reproductive age increases, providers should be carefully checking the card before administering another injection to avoid causing unnecessary side effects.
- Although food intake during pregnancy has improved, there is still a need for further education in this area. Providers could be given a check list of counseling points to be checked off as the health education is done.
- There is still a need for improved communication between the health worker giving the iron tablets and the mother as to how the iron supplements should be taken, how long they should be taken, as well as an explanation why the tablets are being given. Many health care providers are themselves unclear about the rationale for taking iron tablets. This part of the training modules needs to be strengthened. A checklist of counseling points could be used. The issues surrounding iron supplementation are being explored by PATH in related studies in NTB.

## **PROJECT RESULTS BY OBJECTIVE, SUMBAWA AND URBAN MATARAM**

*OBJECTIVE 1: Improve antenatal care by increasing the number of visits with full antenatal services.*

*Results:*

- + More women in Sumbawa attended at least four antenatal care (ANC) sessions during pregnancy (from 41 percent baseline KAP to 63 percent final KAP).
- + In Mataram, 78 percent of pregnant women attended four ANC sessions (KAP).
- Reasons for not attending ANC sessions included: “too busy with housework,” “too lazy,” “not necessary if healthy,” “too far to go.”

*Conclusion:*

**Antenatal care coverage has improved, but continued community education is necessary to increase mothers' understanding and to improve coverage to satisfactory levels.**

*OBJECTIVE 2: Increase the proportion of women and infants protected against tetanus.*

*Results:*

- + In Sumbawa, 76 percent of women received two TT doses during pregnancy (up from 15 percent baseline).
- + In Mataram, 95 percent of pregnant women received two doses of TT (routine health records).
- + In Sumbawa, 79 percent of women and 85 percent of women in Mataram received a dose of TT within seven days of delivery (health records).
- + Cutting the umbilical cord with a sterile instrument increased in Sumbawa (41 percent baseline to 59 percent final) and Mataram (75 percent to 87 percent).
- + Only one infant died of neonatal tetanus in project areas (verbal autopsy).

*Conclusion:*

**Due to improvement in TT coverage and cord cutting, neonatal tetanus has been largely eliminated from project areas.**

*OBJECTIVE 3: Improve iron and vitamin A supplementation of pregnant and lactating women*

*Results:*

- + In Sumbawa, 92 percent of women reported taking iron tablets during pregnancy (up from 61 percent baseline).
- + In Mataram, 91 percent of women reported taking iron tablets during pregnancy (final KAP).
- + In Sumbawa, 87 percent of women received postnatal iron tablets AND vitamin A supplementation (up from one percent baseline).
- Although there was a 17 percent increase from the baseline of postpartum women in Mataram who had written evidence of receiving vitamin A supplementation, the total is was only 30 percent.
- Only 68 percent of pregnant women took iron tablets for more than one month during pregnancy (KAP).

*Conclusion:*

**Micronutrient supplementation increased significantly. Improved communications between health worker and mother on how iron tablets should be taken and correct use of iron tablets are still needed.**

*OBJECTIVE 4: Improve lactation management*

*Results:*

- + Breastfeeding rates remained high (100 percent in Sumbawa, 99 percent in Mataram).
- + Mothers initiating breastfeeding within eight hours of birth increased in Sumbawa (from 60 percent to 72 percent final).
- Infants receiving something other than breastmilk prior to the first feeding has not changed and remains high in Sumbawa (56 percent) and Mataram (34 percent). (Typical traditional first foods include honey, bananas, and premasticated rice.)
- Mothers who remembered being given postnatal information about the importance of early AND exclusive breastfeeding remained low in Sumbawa (three percent) and Mataram three percent).

*Conclusion:*

**There is scope for additional improvement in health education concerning weaning practices. In particular, messages about duration of exclusive breastfeeding and weaning foods need to be emphasized during antenatal counseling. Good counseling techniques (as opposed to simply giving information) should be reinforced with the *dunkun bayi* and *bidan di desa*. Traditional healers should be included in training.**

*OBJECTIVE 5: Improve cord care practices of dukun bayi, mothers, and bidan de desa.*

*Results:*

- + Use of alcohol, mercurochrome, or iodine for cleaning the umbilical cord increased in Sumbawa (from 62 percent baseline to 88 percent final) and Mataram (47 percent to 78 percent).
- + Fewer women reported using harmful substances to treat the cord in Sumbawa (from 67 percent baseline to 43 percent final) and Mataram (63 percent to 26 percent).
- In Sumbawa, 43 percent of mothers continued to use potentially dangerous substances on the cord—typically ash, rice, salt, or herbs.

*Conclusion:*

**While cord care is improving, there is a need for more information and continued training of dukun bayi and bidan di desa. Traditional healers should be included in training program.**

*OBJECTIVE 6: Improve identification and management of low birthweight babies.*

*Results:*

- + In Sumbawa, 81 percent of babies were weighed at birth (up from 29 percent baseline). Mataram increased from 59 percent to 84 percent.
- + Advice on home care of low birthweight infants increased in Sumbawa from 10 percent baseline to 67 percent final. In Mataram, 85 percent of mothers were given advice on how to care for low birthweight infants (up from 33 percent baseline).
- According to field anecdotes, in some areas, low birthweight babies continue to receive potentially harmful traditional treatments, such as cold baths.

*Conclusions:*

**Attention to low birthweight babies, and understanding of the importance of low birthweight as a factor in reducing infant mortality, has improved.**

*OBJECTIVE 7: Maintain high EPI coverage rates.*

*Results:*

- + Hepatitis B vaccine delivered within seven days of birth increased in Sumbawa (from three percent baseline to 90 percent final) and in Mataram (from 24 percent to 54 percent).
- + Full immunization coverage increased in Sumbawa (from 11 percent to 84 percent) and in Mataram (56 percent to 76 percent).
- + No measles or pertussis deaths were reported from project areas (verbal autopsy).

*Conclusion:*

**Coverage for all EPI vaccines has improved dramatically, including delivery of hepatitis B vaccine and OPV within seven days of birth. Vaccine-preventable diseases have been substantially reduced.**

*OBJECTIVE 8: Improve the supervision of project activities and interventions through the development and use of improved supervisory-training modules.*

*Results:*

- + Supervisory training modules were developed and used to retrain all project supervisors in Sumbawa and Mataram.
- + A supervisory checklist was developed and used to improve, standardize, and document all supervisory visits.

*Conclusions:*

**Supervision has improved. A large group of MOH staff at all levels is available to facilitate continuation and expansion of the program.**

*OBJECTIVE 9: Improve community acceptance of bidan di desa operating at the village sub-health center level.*

*Results:*

- + The percentage of births attended by a *bidan di desa* increased in Sumbawa (from 16 percent to 27 percent), and in Mataram (from 40 percent to 54 percent).
- + More women were visited at home by a health professional in the postpartum period in Sumbawa (from 38 percent baseline to 91 percent final).
- + Anecdotally, many *bidan di desa* reported greatly improved acceptance by the community.

*Conclusion:*

**The Healthy Start program has given *bidan di desa* specific health activities within the community, thus improving community acceptance. This is likely to result in increased utilization of formal health services.**

*OBJECTIVE 10: Promote replication of the birth-centered service delivery approach in Indonesia.*

*Results:*

- + The Indonesian MOH has recently adopted the Healthy Start model of at-birth HB immunization and postnatal home visits to all Indonesian infants and their mothers.

- + Using locally available funding, the district of Sumbawa has expanded Healthy Start activities to all 14 health centers in the district. The districts of Bima and Dompu are planning to phase in Healthy Start activities to all their health centers during 1998.
- + An AusAID-funded project, Healthy Mothers Healthy Babies, will implement the Healthy Start approach in its project areas covering four provinces in eastern Indonesia.
- + An AusAID-funded project will implement the Healthy Start information system in its project areas in three provinces.

*Conclusion:*

**The Healthy Start approach is considered appropriate and cost-effective in Indonesia. It is being prioritized for internal funding and for receiving increased external donor assistance.**

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