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**World Vision Relief & Development, Inc.**

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**FINAL EVALUATION  
CHILD SURVIVAL PROJECT  
ZAMBEZIA PROVINCE, MOZAMBIQUE**

**October 1, 1990–September 30, 1993**

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CHILD SURVIVAL PROJECT  
ZAMBEZIA PROVINCE, MOZAMBIQUE

October 1, 1990-September 30, 1993

FINAL EVALUATION  
AUGUST 8-26, 1993

Sponsored by

WORLD VISION AND THE MINISTRY OF HEALTH OF MOZAMBIQUE

Carried out by

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## LIST OF OPERATIONAL DEFINITIONS

**ACUTE MALNOURISHMENT:** Less than 75% of standard weight for height.

**COMPLETE IMMUNIZATION:** Completion of the following before the first birthday: BCG, 3 DOSES OF DPT, 3 DOSES OF POLIO, AND MEASLES.

**ENVIRONMENTAL SANITATION:** Completion of new latrine, construction of new well, and education on proper construction and use of latrines.

**HIGH-RISK CHILDREN:** Children under three years of age in a family who have had at least one child death due to diarrhea. (Or possibly changed to: children with repeated bouts of diarrhea and children of weaning age identified as malnourished or children who fail to gain weight.)

**IMMUNIZATION ROUNDS:** Complete immunization, educational sessions, prevention of diarrhea, preparation of ORS, EPI diseases and importance of immunization, nutrition/weaning, control of malaria. Completion by women of childbearing age and pregnant women tetanus toxoid vaccine (TT).

**MALARIA CONTROL:** Completion of KAP survey, distribution of mosquito net, use of mosquito net, principles of malaria control.

**MATERNAL AND CHILD HEALTH:** Pre- and post-natal examinations, including: breast-feeding, importance of colostrum, appropriate weaning practices, strategies for high-risk pregnancies, education regarding feeding of self, infant, nutrition, prevention and treatment of common newborn illnesses, including diarrhea.

**ORAL REHYDRATION SALTS (ORS):** Packet provided by UNICEF or home mix formula: one liter of clean drinking water, one pinch (pitada) of salt, and one-half handful of sugar.

**POPULATION SURVEY:** Determination of significant movements of a population between two time periods as a basis for modifying target population and program strategies.

**THERAPEUTIC FEEDING:** Admission to a therapeutic feeding center, educational sessions on nutrition, prevention of diarrhea, preparation of ORS and enriched porridge, prevention of malaria, teaching in immunization.

**TRAINING OF TRAINERS:** Completion of training sessions on teaching methods, community mobilization, and content related to: growth monitoring, cereal-based ORS and ORS from packets, proper conduct of home visits, high-risk births, nutrition/weaning, prevention of malaria and diarrhea, marasmus, kwashiorkor, diarrhea for: community facilitators, health assistants, nurses.

**UNDERWEIGHT:** Less than 80% of standard weight for age.

**WOMEN OF CHILDBEARING AGE (WCBA):** Women between the ages of 15 and 45 years.

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## **EXECUTIVE SUMMARY**

### **Overview**

The overall objective of the Zambezia Child Survival Project (the project) was to reduce infant mortality and morbidity of children under the age of five in secure districts of war-torn Zambezia province of Mozambique. This was to be done through a three-year comprehensive program of maternal and child health activities and expansion of the Mozambique Ministry of Health (MOHM) primary health care services at the village level.

### **Rationale**

The MOHM had targeted the Nioadala district in Zambezia Province, as the infant mortality in the area was much higher than the national average, and the province was one of the most war-affected provinces in the country. In 1990, pockets of famine were identified in Zambezia Province and World Vision began an Emergency Response program with food and seed distribution and therapeutic feeding for the severely malnourished. Nioadala, the district where World Vision was based, was evaluated for possible need for a primary health program and in October 1990, groundwork was laid to begin a Child Survival program, funded by the local mission USAID and World Vision.

World Vision, an organization with expertise in food distribution and relief activities, had the capacity to support an infrastructure of staff located in offices and center posts in Zambezia, Maputo, Tete and Nampula and at the village level. Nioadala was viewed as one of the most secure areas in the country, and communications and networking was possible among the project staff, MOHM, and nongovernmental organizations (NGOs).

### **Project Planning**

At the start of the project, three months were devoted by the World Vision health officer during which time the community's needs and expectations were identified by village leaders, local religious and social groups, and by governmental authorities.

### **Project Elements**

The project experienced outstanding success in improving the health of women during childbearing years, and infants between birth and 36 months. The successes were a direct outcome of five specific interventions which were tailored to the learning needs of the villagers and designed to be sensitive to the culture and local customs. The interventions, initiated in October 1990, were: 1) immunizations; 2) nutrition improvement and promotion through growth monitoring, improved breast-feeding and weaning practices and nutrition for mothers; 3) oral rehydration therapy (ORT) and control of diarrheal diseases; 4) malaria control; and 5) training of community health workers (CHWs).

### **Human Resources**

Project activities were carried out by a mix of one and one-half expatriate staff, 23 local staff, and eight support staff. This team, working in 42 village sites throughout the province, implemented, monitored, and managed both the project, and the supporting administrative and information system consistent with expectations of the MOHM and World Vision.

## **Methods**

Methods used were weighing and measuring infants, providing immunizations to infants from birth through 36 months and to pregnant women and women of childbearing age (WCBA), nutrition education, referral services for infants and mothers at-risk, teaching and supervising to promote breast-feeding and weaning practices, use of ORT, care and teaching for diarrheal diseases, providing technical assistance for building latrines; preventing malaria by providing mosquito nets and teaching prevention practices, and training of a cadre of health personnel for maternal and child health (MCH) activities.

Collaboration with the district, provincial, and national MOHM staff was essential as the overall expectation was to achieve sustainability partly through the ultimate management of the project activities by local personnel. Collaboration took place with: Médecins Sans Frontières, WUS, UNICEF, Save the Children, and Agua Rural.

## **Evaluation**

Ongoing, formative evaluation was carried out through a monthly project publication describing achievements and issues for future analysis. End-of-period or summative evaluations were conducted including a technical review of the Detailed Implementation Plan (DIP), an evaluation by an international auditing firm, midterm and final Knowledge, Attitudes, and Practices (KAP) surveys, and a midterm and final evaluation by external evaluators.

## **Accomplishments**

Project accomplishments included impressive changes in the percentage of infants and mothers who were immunized, a low number of reported diseases related to immunization coverage, numbers of latrines and wells built, numbers of villagers and staff trained, and positive changes in the behavior of individual villagers and communities. These changes related to villagers' participation in community health committees, attendance at growth monitoring and health education sessions, participation in a pilot malaria control program, building of latrines, and change in practices related to infant feeding and weaning.

Reporting of disease incidence occurred by mouth; villagers and district and provincial health authorities reported reduced incidence of diarrhea, and no cases of measles during the past year. These experiences have strengthened the community's confidence in the project and in the self-care skills of individuals and the community. This confidence, in turn, has promoted community building activities, such as construction of latrines for village and school use, and the involvement of scores of volunteer CHWs. Thus, the sustainability of the project has proceeded slowly but deliberately throughout the past three years. The success and prominence of the project is noteworthy in that the MOHM and other NGOs have approached World Vision to continue with its work and to provide technical assistance in helping train the staff of other organizations.

## **Immunizations of Infants**

Vaccination screening and immunizations were administered to infants between birth and 36 months. Trained personnel were prepared in immunization procedures and in precautions against HVB and HIV.

Results of the 1993 KAP cluster survey were compared with those from the 1991 baseline and a 1992 vaccination survey. Between 1991 and 1992, a 70% increase in measles vaccination coverage occurred. Comparisons between the 1991 and 1993 results indicated that the percentage of infants 12-23 months old who were fully immunized increased from 19% to 81%. The percentage of dropouts between DTP 1 and DTP 3 doses [DTP1 - DTP3]/DTP1] decreased from 75% to 4%. As of July 1993, the number of immunizations completed were as follows:

Table 1: Infant Immunizations Completed July 1993

Immunization	0-11 mos	12-23 mos	24-36 mos	Cumulative Total
BCG	140	31	14	2,123
APO	57	-	-	919
DTP1	148	10	3	4,704
OPV1	148	10	3	4,677
DTP2	141	15	4	4,374
OPV2	141	15	4	4,359
DTP3	152	26	5	3,819
OPV3	152	26	5	3,821
Measles	130	30	9	6,386

These figures were achieved despite numerous attacks on the health posts during which time the population scattered, despite poor road conditions, lapses in availability of vaccines, excessively long daily travelling schedules, cholera outbreaks, a severe two-year drought and a population comprised of more than 50% dislocated people who migrated frequently during the course of the project.

#### Immunization of Pregnant Women and WCBAs

Pregnant women and WCBAs were provided tetanus toxoid 1 through 5, and teaching sessions concerning vaccination. The 1993 survey showed that 87% of the mothers who delivered in the previous two years had received TT2. Almost three-fourths (72%) had received TT3, and 87% had received TT1. This percentage is based on a target population of 8,800 WCBAs. There were no known reported deaths due to tetanus during the last two years.

The costs of the program elements overlapped; for example, vehicles were used for both program elements and administrative purposes. One simple calculation was used to determine the unit cost of vaccination per person (child or mother). Based on these rough estimates, the cost was approximately \$1.99 per person.

The opportunity costs associated with failure to immunize against six preventable, communicable conditions are staggering. For example, the rehabilitation costs for an infant with polio is prohibitive and rehabilitation is often unavailable in developing countries. In addition, the years of nonproductive employment add to the burden of this disease. Without tetanus vaccination, the likelihood of death from tetanus is quite high. An estimated 47 quality life-years are lost, including at least 25 years of productivity in the work force.

## Nutrition Improvement and Promotion Through Growth Monitoring, Improved Breast Feeding, and Weaning Practices

Infants between birth and 26 months were weighed and their mothers were provided counseling related to the infants' growth and development. In addition, pregnant women were weighed, had their blood pressure taken, were counselled on nutrition and cooking practices, the use of enriched foods, sanitary practices surrounding meal preparation, breast-feeding/weaning practices, and cultural and religious practices during pregnancy.

Of the 270 mothers between 14 and 53 years who were included in the final KAP survey, 14.1% were literate, a figure associated with high rates of infant mortality and morbidity.

Of the total sample, 91.1% were breast-feeding at the time of the final KAP survey; 70.5% were exclusively breast-feeding their infants of 0-4 months during the final survey, up from 40% at baseline. All mothers had breast-fed their infants under two at some point; in the baseline KAP, 73% of mothers tried within the first eight hours after birth, while 80% had in the final evaluation. This finding is critical in that immediate breast-feeding supports return of the uterus to its pre-pregnant state, and prevents immediate post-delivery hemorrhage, a consideration since many mothers have had many children and are at risk for this condition, as oxytocic drugs are not available to prevent blood loss and subsequent anemia. Delayed breast-feeding also puts the infant at risk for dehydration, infection, and loss of essential immunity.

The appropriate practice of feeding solid or semi-solid foods to infants at 5-9 months occurred with 94.9% of mothers in the final survey, up from 70% two years ago. By the end of the project, 84.8% of 4-6 month olds were receiving appropriate high-energy and/or calorie-dense foods, compared with 26% at the start of the project. Thirty-six percent were receiving sources of protein such as meat, fish, beans, or peanuts, compared with 26% at the start of the project. Forty-eight and a half percent started introducing Vitamin A, iron, and other nutrients from such sources as papaya, mango, pumpkin, and leafy green vegetables; this cannot be compared with baseline survey results.

The corresponding percentages for children 7-23 months old were 94.1%, 90.3%, and 84.4%. These figures are in contrast to the baseline in which 70% of the mothers never gave their children fruit, and 56% never gave protein (beans, meat, or fish).

The majority of mothers (73.0%) in the final survey knew that they should start adding other foods to breast milk in an infant's diet at four to six months of age; this knowledge question was not asked during the baseline KAP.

As of July 1993, the following growth monitoring numbers and percentages were achieved:

Table 2: Growth Monitoring of Children July 1993\*

Measure	July 1993		Cumulative	
	No.	(%)	No.	(%)
No. of Children Weighed	1,702		15,944	
No. of Weighings	1,702		23,945	
Underweight (<80% Wt/Age)	842	(49.6)	10,370	(43.3)
No. of 2nd or More Weighings	1,421		15,944	
No. Who Gained Weight	1,134	(79.8)	12,728	(79.8)

Measure	July 1993		Cumulative	
	No.	(%)	No.	(%)
No. Who Lost/Maintained Weight	287	(20.1)	3,216	(20.1)
No. Evaluated for Acute Maln.	1,702		18,698	
No. Acutely Malnourished ( $<75$ Wt/Ht)	28	(1.6)	683	(3.6)

\* See Table 4 in the report for an explanation of calculation of percentages.

The cost of these interventions were minimal as equipment was simple and inexpensive, and where possible, produced locally. The cost of growth monitoring for the population was \$.85 per child.

Anthropometric indices of child growth have been used in public health programs since it was first observed that grades of malnutrition correlated with morbidity and non-physical intellectual and psychosocial aspects of child development. Their two important uses are as a screening tool and as a device to demonstrate to a mother her child's other underlying problems when she otherwise would not have taken notice of them. These indices have also been used to estimate risk of mortality and even greater potential for detecting more proximal health or nutritional problems. To be effective, growth monitoring must involve the mother, as was done in the project, in the process of monitoring the child's growth. It was used as a preventative measure and as a basis for referral to a feeding center, thus preventing severe malnutrition and death. The gains from implementing growth monitoring were most beneficial at a very modest cost.

#### **ORT and Control of Diarrheal Diseases (CDD)**

Vaccination team leaders (nurses), maternal child nurses, the water and sanitation supervisor, and respective adjudantes of all three groups were responsible for implementing the CDD interventions in which mothers were motivated to use, correctly prepare, and administer a home-mixed sugar and salt solution, and other home-based and cereal-based fluids (CB-ORS) to treat diarrhea. In addition, community facilitators made follow-up visits, reported, and recorded actions taken and outcomes observed.

During a 12-hour training program, CHWs (adjudantes) learned hand washing and the "clean" techniques, use of latrines, maintenance of good feeding practices, preparation and administration of ORS and CB-ORS, and referral. In addition, the technical content and methods of community development were taught concerning well and latrine construction.

*Diarrheal Management—Continued Breast-feeding:* Mothers' management of diarrhea showed considerable improvement over baseline results. Fifty-seven percent of mothers in the final survey continued breast-feeding their child with diarrhea at normal or increased levels versus 29% at baseline.

*Diarrheal Management—Continued Fluids:* An increase from 29% at the start of the project to 62% at the end was reported for giving usual or increased amounts of other liquids during diarrheal episodes.

*Diarrheal Management—Continued Foods:* An increase from 16.5% to 46% was reported for giving solid or semi-solid foods during diarrheal episodes.

*Diarrheal Management—ORT Use:* The proportion of mothers who reported treating the diarrhea with an appropriate form of ORT (including cereal-based ORS, SSS, and ORS from a packet) increased from 6.5% to 56%. The proportion of mothers reporting use of anti-diarrheal medicines was unchanged and a greater percentage reported doing nothing to treat the diarrhea than at baseline.

Two-thirds of mothers reported that they sought advice or treatment for their child with diarrhea, of which the majority (74%) used the health center or hospital.

For 69.3% of the households, the primary source of water was an unprotected well compared with 53.7% in the baseline. Almost the same percentage had access to a protected well (30.4% in 1993 and 37.4% in the baseline). For 78.9%, the source of water was within one km, for 19.6% between one and two kms, and for 1.5% over two kms.

In the baseline survey, 93.9% had no latrines compared to 79.6% in 1993. However, by July 1993, the total number of latrines that had been constructed was 523, with 148 under construction.

The cost of building latrines includes the labor of the latrine's owner and local materials which the community supplies. This activity is one mechanism used by the project staff to restore the self-esteem of the community's male population which was partially destroyed during the brutal ambushes and attacks on the villages during the war.

In 1990, UNICEF estimated Mozambique's infant mortality rate at 200/1,000 per year, with diarrhea as the leading cause of death. The results of the 1991 KAP survey showed that 74% of children aged two years or under experienced one or more episodes of diarrhea within two weeks of the interview compared with 51% in 1993. This difference may be accounted for by a seasonal effect or an increase in the proportion of households with access to protected water sources and latrines, project and MOHM educational efforts, or other factors. The July 1993 monthly report for World Vision CSP reported a cumulative number of 362 cases of diarrhea since January 1993 among the 2,700 0-3 year olds in the target population.

The benefits of savings in person-lives of infants is considerable as bouts in the first year deprive infants of energy required during the most rapid period of growth (after the intrauterine period) in humans. The cost difference between ORT and medications for diarrhea was substantial; ORT requires no costs for professional expertise, and no costs for equipment and supplies such as IV bottles, transfusion kits, and solutions. Ingredients for ORT are available locally and include one liter of water, two fistfuls of maize, two pinches of salt, with an optional two tablespoons of sugar.

### **Malaria Control**

Supervisors, team leaders, and CHWs were responsible for malaria control activities which included using mosquito nets, clearing brush from courtyards of houses, covering pools of stagnant water with dirt, burning leaves, wrapping burned leaves around sleeping mats, and removing garbage from household areas.

Teaching/learning methods, including songs, dances, skits, puppet shows, etc., were directed at the community to illustrate the relationship between the mosquito, the disease, and its symptoms.

Of the 270 mothers in the final survey, 86.9% believed that malaria was a major problem in their community compared with 88% in the baseline. About 27% in the baseline were practicing some form of prevention. In the final survey, 60.0% said they were practicing some form of prevention. Of these, 46.3% burned leaves or cleared brush from around their household, 14.8% removed standing water (compared with 13% at baseline), 3.7% were using mosquito nets, and 2.6% were taking anti-malarial medication.

Mosquito nets were installed in all houses in two pilot villages. Villagers report less incidence of malaria and indicate that they are able to sleep uninterrupted during the night because of the protection of the nets.

At baseline, nearly 80% of children aged two or less had contracted malaria at least once during two weeks of the interview. In the 1993 survey, 35.9% reported malaria in their infants during the same time interval, a reduction of 40%.

Though some of this can be attributed to seasonal effects, the reduction of incidence of malaria during pregnancy cannot, since pregnancy transverses multiple seasons. A 27% reduction in mothers who had malaria during pregnancy was found between baseline and 1993 (70% to 43%).

These reductions save energy in infants who are in a period of rapid growth. By avoiding episodes of this debilitating disease, their bodies' energy can be used in productive ways, to support physical, psychological, and social development. For mothers who require extra energy for pregnancy, lactation, and the care of children, the opportunity costs are considerable.

### **Human Resources Development/Training**

Project staff, headed by a health education/training specialist, created a training unit in which culturally appropriate curricula, training methods, and audiovisual materials were produced. Staff provided initial and ongoing training for supervisors from the local community who, in turn, prepared team members from the village who were familiar with the local dialect and customs.

The World Vision staff educated supervisors from the local community who in turn prepared team members who knew the local dialect and could communicate directly to the villagers. Staff trained included: Technical World Vision and MOH staff, adjudantes, community facilitators, mothers of 0-3 year olds, pregnant women, women of childbearing age, the community in general, and health committees.

Project staff educated basic health assistants (adjudantes) within the MOHM policy. These assistants helped the mobile team leaders (EPI/GM) in community health education.

Each health team had one to four assistants who carried out different tasks. In all, 32 have been trained. Developed skills included: weighing and measuring children, data collection, participation in health education sessions, making flagstone latrine covers, and creating and modifying health education materials.

Sixty-four community facilitators were trained and worked under supervision. The staff trained these nonsalaried volunteers who were capable of teaching nutrition and ORT, and who were trained to promote health and well-being in their communities. The health

committees in each barrio developed the selection criteria for these facilitators who served 400 to 500 families.

Through refresher courses, nurses received supplementary training in AIDS and Vitamin A.

Each woman received training during vaccination and growth-monitoring rounds. Mothers were involved in counseling sessions which focused on growth, vaccination, and nutrition status of the child. Public education sessions were also provided on child survival themes.

Local health committees were formed and included village members such as: village health workers, secretaries, religious representatives, traditional healers, rural water representatives, teachers, agricultural extensionists, and community facilitators. Five committees with 38 members worked in target areas by identifying and prioritizing community health problems, working with other sectors in the community, and implementing solutions particular to the issues at hand.

Project staff interacted frequently with officials from the MOHM who noted with appreciation the frequency and helpfulness of these sessions and the role the sessions played in keeping them current with the field situation. MOHM staff were also included as part of the evaluation team, as they were seen as pivotal in ensuring ongoing monitoring for quality after the project funding ends.

#### **Training and Documentation Methods and Materials**

Teaching materials were produced on selected aspects of basic health care including: diarrhea, breast-feeding/weaning, nutrition, malaria, AIDS, and vaccination. Culturally appropriate visual materials were created, pretested, and adapted to the educational level of the mothers.

Forms for data collection for illiterate workers were developed using illustrations of health care concepts. These forms were revised through pilot tests to assess their validity, reliability, utility, and scorability.

Dependable and effective vaccination/growth-monitoring rounds were used to teach CSP target villagers to expect and rely on these preventative health activities. Once CSP teams leave, villagers will be motivated to organize themselves into mobile vaccination teams or seek vaccination at the health post, given that the mobile teams or post provides effective care.

The CSP staff instituted joint technical teaching meetings with the MOHM. This activity is sustainable once the project is terminated, as the meetings were run by Mozambican nurses. In addition, the information gained at these meetings should last beyond the life of the project.

The most sustainable component of the project was the learning that occurred because of the teaching that took place. Nurses and CHWs and members of the technical staff were exposed to seminars on teaching methods, group problem-solving, health committee formation, communication skills, and exercises in planning and preventative health care. Nurses implemented what they learned by forming health committees in their villages, teaching communities on the learned content, and teaching locally hired health assistants about vaccinations and growth monitoring.

The MOHM intends to implement a program in which the CHWs would provide a fee for service to the community (APE program). In this regard, the current teaching activities of World Vision provides a baseline for the teaching that can be undertaken by the MOHM, thus providing a direct link with governmental plans for development.

The overall costs of the project are substantially lower than other similar projects because of the use of local personnel and the insistence on using locally made materials and supplies. Trainees who could benefit from group learning were exposed to intense instruction, and they developed skills which will be transferrable when the MOHM is able to absorb the project elements into its program.

### **Lessons Learned**

The lessons learned from this project relate to the extremely positive relationships developed between project staff and the district and provincial levels of health. World Vision efforts were seen as critical in helping returning and dislocated populations receive basic health care, which for many was the first contact with the health service in five years. Despite the desperate curative needs of the people, they became involved in the medium- and long-term health promoting activities described above. In addition, the project retrained, employed or enlisted as volunteers scores of local people at costs significantly lower than those required to hire expatriates. The project's sustainability has also been enhanced by using local rather than foreign materials, such as local paper, materials for building latrines, and locally made teaching materials.

### **Recommendations**

Based on the above findings and lessons learned, the following recommendations are made:

1. Given the successful development and implementation of the five elements in the targeted geographical area, next-step activities should be initiated. Staff and administration may want to structure planning workshops to define the preferred future and strategic plans for the project, based upon midterm and final evaluations, changing populations, and the complementary interventions under way by other governmental and nongovernmental organizations (NGOs).
2. In order to integrate more local, multipurpose workers, the standardized protocols should be collated and published in a project manual, including the culture-specific illustrations developed for use at the village level.
3. As new multipurpose workers (adjudantes) and other local staff are added, and as the project expands, the need for a deputy director becomes evident. This person would closely supervise internal operations, including the development of protocols, documentation and implementation of local personnel policies, expansion into new geographical areas, and possible expansion of project elements. Creating this position would free the associate director for networking, public relations activities, and developing linkages and further collaboration with ministerial organizations and NGOs.
4. As the population stabilizes during the medium- and long-term post-disaster phase, an evaluation should be developed which captures coverage issues and establishes comparisons based on common population bases. To meet this recommendation, an

epidemiologist/statistician might be recruited as a consultant to develop an evaluation blueprint, the methodology, data collection and analysis of project data.

5. As the project works more closely with the MOHM and prepares staff to fill governmental positions, a common coordinated curriculum should be designed for training the several layers of personnel required. A short-term consultant with knowledge of the language, the project, and the policies and practices of the MOHM should be recruited to prepare the curriculum, and develop and teach training-of-trainers courses.
6. In keeping with the MOHM's concern for quality control, and in keeping with the changing needs of the population, job descriptions of all personnel should be written and reviewed with governmental authorities. The specific functions and tasks of each worker can be derived directly from the standardized protocols developed (Recommendation #2), to which the expected chain of authority can be added (that is, TO WHOM and FOR WHOM) to clarify who is accountable to whom.
7. Given the incidence and prevalence of HIV, special precautions and training should be instituted, particularly for midwives, other MCH personnel, and cleaning staff. Specifically, those dealing with high-risk situations, such as deliveries, need goggles, rubber aprons, and disposable gloves. WHO's Global Program on AIDS documentation might be used as it is designed specifically for care in developing countries.
8. Given the care with which local personnel, teaching materials, and interventions have been developed, consideration should be given to a range of mechanisms to communicate the results of the project to others. A video describing achievements could be developed accompanied by a photo exhibit with brochures and other media documentation. CNN and National Public Radio might be target media organizations capable of providing documentary coverage of the project.
9. Considering the strong evaluation focus of the project, and the outcomes documented, consideration should be given to publishing the results in professional nursing, medical, public, and environmental health journals. Staff should consider hosting an international meeting and presenting, through poster presentations or papers, project findings and lessons learned. Consideration should also be given to presenting at the annual regional committee meeting of WHO in Brazzaville, Belgian Congo.
10. Consideration should be given to a review of the wages, hours, and working conditions of both expatriate and local staff, as they work long hours each day under difficult emotional and environmental conditions. This review might, in the long run, avoid the costly consequences due to burnout and the need to recruit, train, and place new staff.

## RESPONSES TO QUESTIONS A THROUGH K

### A. Sustainability Status

*1. At what point does A.I.D. funding for Child Survival Project activities end?*

Project funding by USAID Local Mission and project activities began in the Nicoadala District of Zambezia Province in October 1990, through an official contract between the MOHM and World Vision. The project was scheduled to end on September 30, 1993.

*2. At what point does the organization plan to cease Child Survival Project activities?*

World Vision and the Ministry of Health, Mozambique (MOHM), see the project as having achieved its mission but believe that future activities are essential to ensure the following: absorptive capacity by the local communities, further support of the MOHM at all levels, and managerial capability throughout all project activities. As this project was seen as a long-term, nine-year effort, the first three years might be viewed as a start-up period to be followed by a period of consolidation to establish sustainability of the project. World Vision has submitted a proposal to USAID for continuation in Zambezia through 1996.

*3. How have major project responsibilities and control been phased over to local institutions? If this has not been done, what is the plan and schedule?*

The expectation to turn the project over to local institutions and authorities began when the project was launched in October 1990. Local authorities and village leaders became involved early on and played leadership roles in harnessing resources, providing supervision, and selecting recruits for training throughout the life of the project.

While the project staff was committed to selected elements (immunizations, nutrition education, etc.), it also focused on strengthening the infrastructure in which project elements could be implemented. In this regard, the staff worked towards the goal of independently functioning health centers which could be considered self-sustaining. The next proposed phase would focus on implementing effective monitoring and quality control mechanisms for long-term sustainability.

### B. Estimated Recurrent Costs and Projected Revenues:

*1. Identify the key Child Survival activities that project management perceives as most effective and would like to see sustained.*

The most immediately effective activities were the vaccination and growth monitoring elements. Both were seen as sustainable only with continued financial support. Another extremely effective activity in the long term was community education, particularly as it related to hygiene, diarrhea prevention and treatment, malaria prevention, consciousness-raising toward immunizations, use of nutritious foods, and weaning practices.

The training that took place was also highly productive and effective at all levels, including health committees, community facilitators, locally hired adjudantes (CHWs),

and nursing and administrative staff. Water and sanitation activities were effective as hundreds of latrines were built with materials and labor donated entirely by the community.

The pre- and post-natal care and consciousness-raising for family planning activities played an integral part in improving survival of young children.

2. *What expenditures will continue to be needed (i.e., recurrent costs) if these key Child Survival activities are to continue for at least three years after Child Survival funding ends?*
3. *What is the total amount of money in U.S. dollars the project calculates will be needed each year to sustain the minimum of project benefits for three years after CS funding ends?*

In general, funds will be required to sustain the project's major interventions, namely, immunization, malaria control, the nutrition components (growth monitoring, breast-feeding/weaning, nutrition education), diarrhea control/oral rehydration therapy and water/sanitation activities. Recurrent costs are shown in the following:

Table 3: Recurrent Costs\*

Item	Amount (\$)
<b>SUPPLIES AND EQUIPMENT</b>	
Needles/syringes*	30,000
Office supplies	8,000
Weighing/measuring instruments	2,000
Iron supplement	
Maternal/child equipment (BP cuffs)	2,000
<b>SUBTOTAL</b>	<b>42,000</b>
<b>TRAINING</b>	
Staff management training and supervision: field and national/international seminars	15,500
Materials for Health Committee CF training	7,500
Materials used by nurses, HCs and CFs to train community	3,000
<b>SUBTOTAL</b>	<b>26,000</b>
<b>SALARIES</b>	
Nursing supervisors 6 @ \$350/mo. x 12 mos.	25,200
Nurses 12 @ \$200/mo. x 12 mos.	28,800
Local assistants 50 @ \$40/mo. x 12 mos.	24,000
<b>SUBTOTAL</b>	<b>78,000</b>
<b>TRAVEL</b>	
Maintenance of 10 vehicles	30,000
Maintenance of 12 motorcycles	3,600
Fuel - 10 cars x 60 ltr./wk x 50 wks. x 0.85/ltr.	25,500
<b>SUBTOTAL</b>	<b>59,100</b>
<b>TOTAL</b>	<b>205,100</b>

\* Costs reported for both Zambezia and Tete.

\*\* Vaccines supplied by UNICEF.

4. *Are these costs reasonable given the environment in which the project operates (e.g., local capacity to absorb cost per beneficiary)?*

Under ordinary circumstances, a government would be expected to absorb the costs of a project upon termination of activities. However, the situation in Mozambique warrants special consideration. The current MOHM planning document states that Mozambique depends on 62% of funding from outside the country and anticipates reducing this amount to 50% over the next ten years. Given this projection, and given the expected benefits in preventing costly illness and disability, these costs are quite reasonable and are in line with donations given by other NGOs and governments.

Efforts are under way between project staff and the MOHM to streamline project activities so that the existing personnel will be able to implement them, given the number of personnel the government will be able to employ and given the level of educational preparation of the staff.

5. *What are the projected revenues in U.S. dollars that appear likely to fund some Child Survival activities for at least three years after A.I.D. CS funding ends?*

Revenues in U.S. dollars that appear likely to fund some child survival activities for at least three years after A.I.D. CS funding ends include:

- a. World Vision Support Offices (Australia, Taiwan, Singapore, Canada, and New Zealand) have given an average of \$320,000 per year over the past three years towards CSP activities and indicate that they will continue to do so.
- b. The Netherlands has donated \$200,000 per year to World Vision health activities over the past two years, and it is anticipated that it will continue to do so.

6. *Identify costs which are not likely to be sustainable.*

Although listed in the budget, ongoing purchases of vehicles and maintenance costs may not be sustainable by the MOHM until Mozambique is able to manufacture and maintain its own cars or develops its own logistic and economic capabilities to handle the purchase and transport of vehicles from South Africa. Thus, multiple mobile vaccination teams in one district that require the daily use of a car cannot be considered sustainable. An alternative would be the purchase of sturdy but significantly less costly bicycles, or Honda 50cc motorcycles, which are now manufactured in Maputo, Mozambique.

The practice of distributing mosquito nets cannot be sustained until they can be produced locally through the generation of income. It should be noted that some revenue from the sale of these nets at a nominal price was returned to the community. Plans were under way to begin production of these nets in Quelimane.

7. *Are there any lessons to be learned from this projection of costs and revenues that might be applicable to other Child Survival projects or to A.I.D.'s support of those projects?*

The emphasis the MOHM placed on developing standardized protocols was exemplary as it emphasized the use of routine, repeatable activities which could be implemented

safely, efficiently, and effectively by local personnel whose salaries could be absorbed by the government after project funds were withdrawn.

Developing goals that are mutually shared between a Ministry of Health and a PVO enhances the efforts of both parties as each can understand and make efforts to reach them.

A major lesson learned is that local staff should receive wages consistent with those of local employees working at similar levels and carrying equivalent responsibility. A stipend or special per diem can be issued if the local staff must carry out work which requires financial support beyond that of wages received. This recommendation is made in light of the experiences of World Vision staff and is consistent with practices in other parts of the African region and with other organizations which use an expatriate and local staff mix.

The devastation to the MOH infrastructure by war and economic stagnation was severe. It will take many years for the country to operate an effective primary health care system autonomously. The National MOH itself is not planning for complete autonomy within the next 10 years (see the sustainability section of this proposal). A massive rehabilitation program must be initiated before the MOH can absorb many of its previous responsibilities.

The war and its chaotic aftermath have resulted in massive population migrations, fluxes in the numbers of target populations, and made ongoing monitoring of coverage of primary health interventions difficult. World Vision developed a monitoring system for primary health interventions that includes a yearly census (as long as migrations continue). The number of women and children vaccinated were monitored monthly, but true coverage is determined only by surveys (i.e., baseline and final KAP, and MOH-implemented surveys).

Population migration resulted in actual changes in target populations as target villages leave the project area and new villages enter it. World Vision developed an effective teaching methodology of preventative health practices that can be maintained at the community and home level. The success can be seen by looking at the final KAP survey results, which show a significant increase in numbers of mothers practicing appropriate nutrition, weaning, diarrhea management, malaria control and water/sanitation activities. Knowledge acquired by communities remain no matter where the villagers migrate.

It was difficult to measure impact in terms of incidence of diarrhea, measles, infant mortality rate, etc., because existing health posts were not equipped with trained staff who consistently maintain proper records. In addition, many villagers with illnesses never reach the health post because of the distance or lack of faith in its curative capabilities.

The most sustainable primary health activities were those where the community contributes its ideas, labor and material. World Vision has found a considerable increase in community receptivity and participation in primary health activities among those villages with health committees and volunteer community facilitators who take responsibility for identifying and resolving important health problems in the village and in making home visits to provide individual care to mothers.

Ventilated Improved Pit (VIP) latrines were condemned by the Ministry of Rural Water for being too expensive and requiring materials that were not locally available. Over the course of the Tete Health and Tete and Zambezia Child Survival Projects, over 2,200 VIP latrines have been constructed by the community, using innovative substitutes for the ventilator pipe mesh covering, and cement floor. A paper on this activity was presented at the National Conference on International Health in Washington, D.C., in June 1993.

### C. Sustainability Plan

*1. Please identify number and position of project staff interviewed and indicate the extent of their involvement in project design, implementation and/or monitoring/evaluation.*

Expatriate Members:

- National Associate Director of Health (Tete & Quelimane) Trainer, Technical Services, Technical Content (1 person)
- Project Financial Manager (Maputo) (1 person)
- Health Officer (Zambezia) (1 person)
- Administrator (Zambezia) (1 person)

Mozambican Members:

- Liaison Officer with MOHM (Zambezia and Tete) (1 person)
- Nursing Supervisors (Zambezia) (2 persons)
- Trainer Supervisors (Zambezia) (2 persons)
- Team Leaders, Vaccination/Growth Monitoring (Zambezia) (5 persons)
- Adjudantes, Vaccination/Growth Monitoring (Zambezia) (24 persons) (Appendices B, C)
- Supervisor of MCH Health Post Support (Zambezia) (1 person)
- Team Leaders, MCH (Zambezia) (2 persons)
- MCH Adjudantes (Zambezia) (2 persons)
- Environmental Sanitation Officer (Zambezia) (1 person)
- Adjudantes, Environmental Sanitation (2 persons)
- HIS Assistants (2 persons)
- Administrative Assistant, Translator (Zambezia) (2 persons)

The associate director of health served as health manager, trainer, and supervisor of technical content. As a physician, she oversaw both the administrative and technical content of training and services in coordination with the health officers and technical team leaders in Zambezia.

The project financial manager prepared monthly financial reports for the project using the field documents compiled by the support services staff.

The health officer who initiated the project was a registered nurse with an M.P.H. and more than nine years' experience with PHC projects in developing countries. She was replaced in November 1992 by a second health officer, a nurse with four years of administrative and managerial experience in WV Australia.

The health administrator worked with the CS project as well as with the World Vision Emergency Relief project. She implemented and supervised transport, warehousing and financial systems, and controls for World Vision health in Zambezia.

The IIS coordinator (not interviewed—she left Mozambique in June 1993) supervised two assistants in Zambezia and two assistants in Tete. She collated and summarized data related to project objectives, interventions, and outcomes.

The liaison officer served to interpret project needs and expectations to MOHM staff and in turn ensured that MOHM policies and practices were clearly understood by project staff. He worked as an advocate for the project to the district, provincial, and national MOHM personnel.

The training supervisors were responsible for health committee training, community facilitator training and supervision, and malaria control interventions; they also ran workshops for adjudantes, CFs and HCs on training methodologies for the community.

The nursing supervisors were responsible for day-to-day management of the program and supervision of five vaccination/growth-monitoring (v/gm) team leaders who, in turn, were responsible for the 24 v/gm adjudantes who worked with them in the field. The vaccination/growth-monitoring team provided immunization, growth monitoring, nutritional education, and training in control of diarrheal diseases and malaria.

The MCH supervisor was responsible for day-to-day management of the MCH program and supervision of two MCH team leaders who, in turn, were responsible for the two MCH adjudantes who worked with them in the field. The MCH team provided pre- and post-natal care, missed-opportunity tetanus vaccinations and iron tablets for pregnant mothers.

The environmental sanitation officer was responsible for safe water access by the community and providing technical assistance to villagers in constructing latrines. He supervised the two environmental sanitation adjudantes who worked with him in the field.

**2. Briefly describe the project's plan for sustainability as laid out in the DIP, or other relevant A.I.D. reports.**

The sustainability of the project will be partly dependent upon factors external to project efforts, including the political stability of the country and the ability of the people to return to their land. In areas where fighting has taken place, people have not had access to health care, and in some instances have been forbidden, under threat, to seek care in another province or district.

The project's sustainability was also dependent upon the rebuilding of the infrastructure, including communication mechanisms and transport. As indicated in the DIP, it is estimated that eight to ten years are required after peace to rehabilitate the health infrastructure in Mozambique. This project ended only one year after the peace accord was signed. Clearly, complete sustainability in an immediate post-war environment, under the best of circumstances, is not possible, and was not fully expected by the DIP's authors.

If the project's efforts are fruitful, thousands of returning refugees may enter or leave the area and will alter the type and composition of beneficiaries. If the infrastructure rebuilding does not proceed, the efforts of the project will also be affected.

From the project's onset, it was intended that the Ministry of Health, the Women's Organization (OMM), and members of the community, including consumers, would participate actively during project planning and implementation. In this way, they would identify with the project and acquire increasing competence in carrying out its activities. This identification has indeed occurred.

As the project became successful and its work became known to others, requests for assistance and collaboration have increased, including those from the MOHM.

Thus, it is critical that a deputy director be recruited to provide the intense, consistent mentoring and supervision of everyday operations while the associate director focuses on networking activities, public relations, and activities linking the governmental and nongovernmental agencies in strategic planning and implementation developments.

3. *Describe what sustainability-promoting activities were actually carried out by the PVO over the lifetime of the project. The analysis of these activities also addresses Item D1: List the indicators the project has used to track any achievements in sustainability outputs and/or outcomes, and D2: Do the indicators show any accomplishments in sustainability?*

This analysis uses a fact structure which answers the simple question of: "Who did what to whom to achieve what outcome at what cost?"

The CPS interventions included:

- 3.1 Immunizations;
  - 3.1.a Infants
  - 3.1.b Women
- 3.2 Nutrition improvement and promotion through growth monitoring, improved breast-feeding and weaning practices and nutrition for mothers;
- 3.3 Oral rehydration therapy (ORT/control of diarrheal diseases);
- 3.4 Malaria control; and
- 3.5 Training of community health workers and others.

These interventions are further detailed below.

#### *3.1.a Immunizations, Infants:*

**Who:** Five team leaders carry out the interventions assisted by 24 adjudantes and managed by two World Vision supervisors.

**Did What:** Immunization rounds with teaching and documentation were carried out in each of the 42 villages every one to two months. The following vaccines were administered: diphtheria, tetanus, pertussis (whooping cough) (DTP1, 2, and 3); oral polio vaccine doses (OPV 1, 2, 3), BCG (for tuberculosis) and measles.

**To Whom:** Infants between birth and 36 months of age.

**With What Results:** A baseline KAP survey was carried out in 1991, with follow-up surveys in 1992 and 1993. An adapted version was created from the generic "PVO Child Survival Knowledge and Practice Questionnaire" developed for use in USAID Child Survival projects by the Johns Hopkins University Child Survival Support Program (JHU CSSP) and other U.S. and international experts.

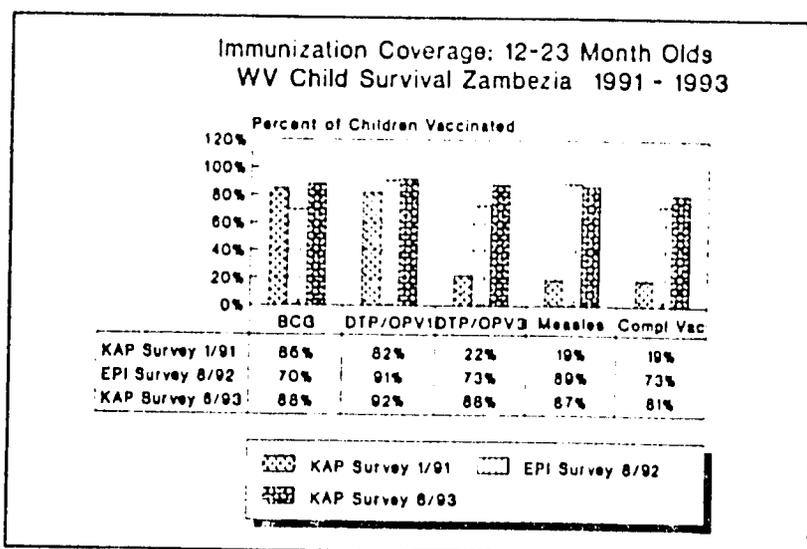


Figure 2

The above Figure 2 shows remarkable increases in DTP3/OPV3 and measles coverage between 1991 and 1992, with DTP3/OPV3 increasing by 250% and measles coverage increasing by over 300%. All rates (except for measles) increased again between 1992 and 1993. The increase in completed vaccination coverage for 12-23 month-old children increased more than fourfold over the course of the project, indicating an effective outreach to the rural villages in Nicoadala.

The effectiveness of World Vision's follow-up program for absentee children during vaccination rounds can be seen by the decreased dropout rate since the start of the project. The dropout rate or percentage of change between DTP1 and DTP3 doses  $[(DTP1 - DTP3) / DTP1]$  decreased from 75% to 4%.

The 1991 KAP survey of BCG counted all vaccines regardless of whether or not the child had a scar showing a reaction to the vaccine. The 1992 EPI and 1993 KAP surveys counted only children with scars on their arms. This resulted in a lower apparent coverage for BCG between 1991 and 1992.

Finally, as of July 1993, the number of immunizations completed were as follows:

Immunization	0-11 mos	12-23 mos	24-36 mos	Cumulative Total
BCG	140	31	14	2,123
APO	57	-	-	919
DTP1	148	10	3	4,704
OPV1	148	10	3	4,677
DTP2	141	15	4	4,374
OPV2	141	15	4	4,359
DTP3	152	26	5	3,819
OPV3	152	26	5	3,821
Measles	130	30	9	6,386

These figures were achieved despite numerous attacks on health posts which led to the scattering of the population, poor road conditions, frequent breaks in the cold chain

(required to keep vaccines effective), excessively long daily travelling schedules, a severe cholera epidemic, and the necessity to use military convoys.

The World Vision DIP did not propose nor did it collect outcome measures on incidence or prevalence of the communicable diseases. Its expected outcomes were: number and percent of children fully registered and vaccinated or 4,624 (80%), and number of vaccination reports received. As is shown on the previous page, the target coverage was met and slightly exceeded.

Figure 2 showed a fourfold increase in completion rates of infants 12-23 months old for the six EPI vaccines during the project period. The figures below demonstrate this increase in absolute numbers of completed vaccinations each month and cumulatively. These figures correspond to the KAP finding of 81% complete coverage among 12-23 month-old children, and exceeds the goal of 80% of children with completed vaccinations stipulated in the DIP.

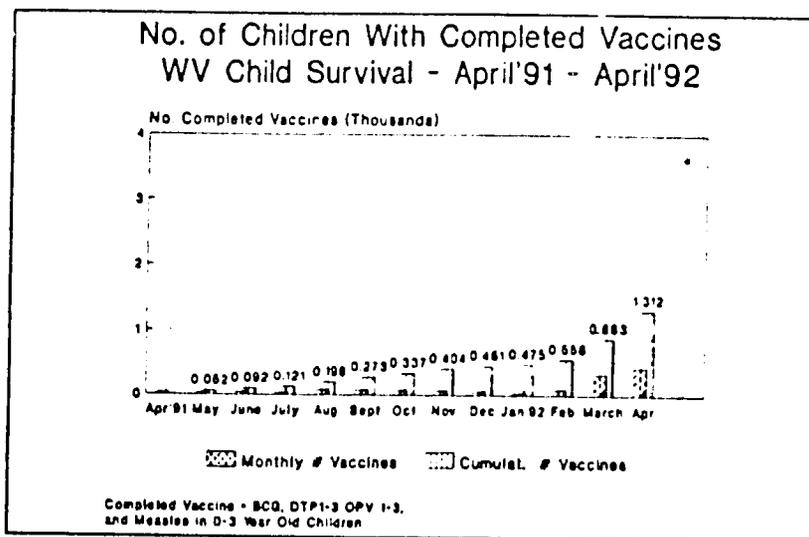


Figure 3

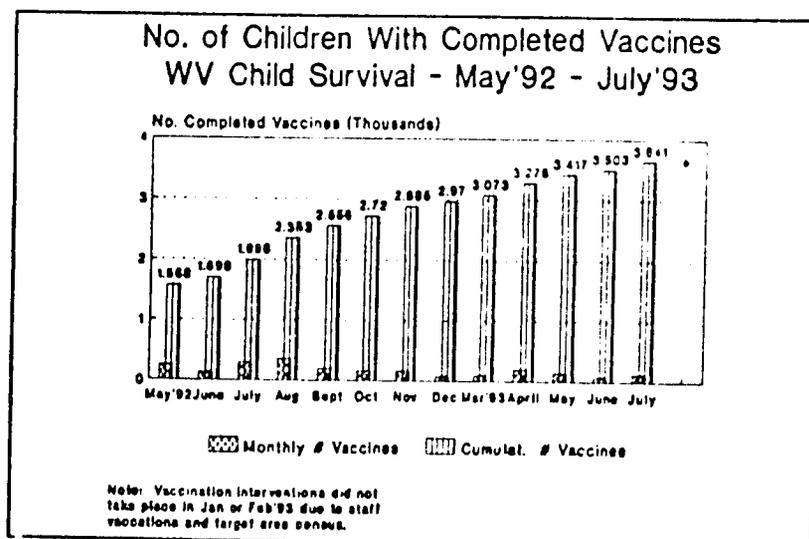


Figure 4

### 3.1.b Women

**Who:** People responsible for providing tetanus toxoid included the same team members as for the immunizations, as well as the MCH team.

**Did What:** Provide tetanus toxoid doses 1 through 5, and teach the importance of vaccination.

**To Whom:** The second target group under the immunization element was mothers who were pregnant or who were WCBA.

**With What Results:** The DIP benchmarks set a goal of 80% of WCBA to receive one or more tetanus toxoid vaccines. This benchmark was revised in June 1992 to correspond with the MOH policy stating that pregnant women require at least two tetanus vaccinations for full protection during pregnancy. The new benchmark was for 75% of women of childbearing age in the project area to receive TT2 or more. The project exceeded this goal by 7%, as shown in the figures below.

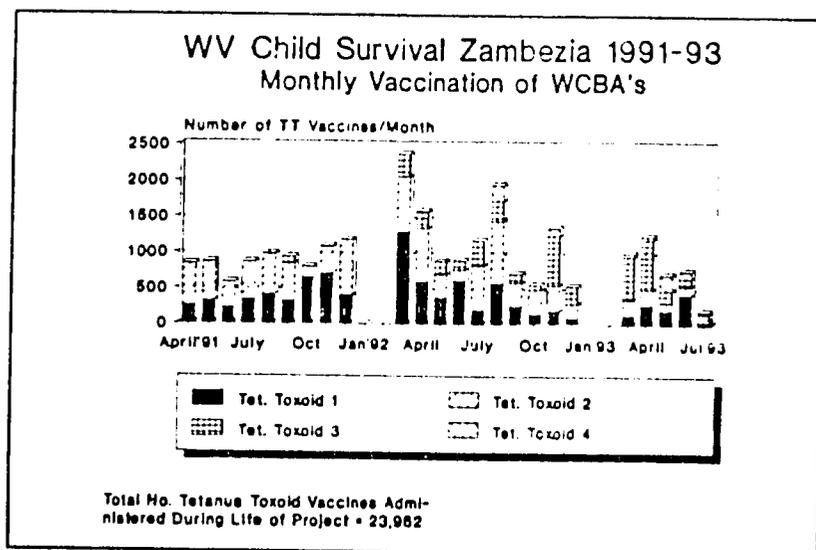


Figure 5

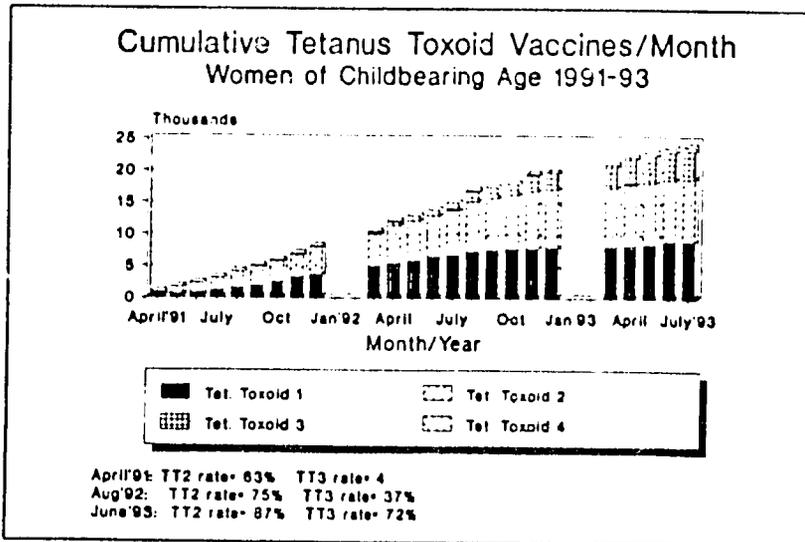


Figure 6

The TT vaccination coverages referred to in Figure 6 are based on the same surveys referred to in 3.1.a: Baseline KAP Survey (January 1991), EPI Survey (August 1992), and Final KAP Survey (June 1993).

Table 4 shows the actual numbers of women vaccinated with each tetanus vaccine over the life of the project.

Table 4: Tetanus Toxoid, 1-5 Vaccination Rates

Tetanus Toxoid	Pregnant Women & WCBA Number
TT1	9,712
TT2	7,640
TT3	4,311
TT4	769
TT5	9
Totals	22,432

The project only began reporting neonatal deaths in May 1993. Since that time, one neonatal death was reported to the MCH team; the cause of death however was not stated.

**At What Cost:** The costs of each program element overlapped considerably; for example, vehicles were used for all five program interventions as well as administrative purposes. One simple approach to assess the unit cost was used to calculate the cost of vaccinations per person (child or mother) (Appendix A). Based on these rough estimates, the cost per vaccination was approximately \$1.99 per person.

The opportunity costs associated with the failure to vaccinate against the six preventable childhood communicable conditions is staggering. For example, the rehabilitation costs for an infant with polio is prohibitive and unavailable in developing countries, particularly in those which must attend to the rehabilitation of soldiers and

adult workers. In addition, the years of nonproductive employment adds to the burden of this disease.

Without the tetanus vaccination, the likelihood of death from tetanus is quite high. An estimated 47 quality life-years would be lost, including at least 25 years of work productivity.

### ***3.2 Nutrition improvement and promotion through growth monitoring, improved breast-feeding and weaning practices, and nutrition for mothers.***

***Who:*** Supervisors, team leaders (basic nurses), MCH nurses, and adjudantes were responsible for these interventions.

***Did What:*** Weighing and measuring infants between birth and 36 months was carried out. Mothers of infants between birth to three years were given group education on nutrition, breast-feeding/weaning practices and the importance of monitoring the growth of their young children. Pregnant women were weighed, and given pre- and post-natal examinations including blood pressure measurement, fetal heart tones, and pregnancy-risk assessment. These interventions were provided monthly. The women were also given the above nutrition messages on a small-group basis and received individual counseling on family planning practices and cultural/religious practices associated with pregnancy and newborn nutrition.

***To Whom:*** Services were provided to infants between birth and 36 months and to women during the pre-, intra-, and postpartum periods.

***With What Results:*** Children's mortality rates were high because of increased malnutrition, disease, and loss of health services. In 1989, UNICEF estimated Mozambique's infant mortality rate at 200/1,000 per live births. This estimate decreased slightly in 1992 to 141 infant deaths per 1,000. The 1992 MOHM Epidemiology Department reports 215-275 deaths per 1,000 for 0-5 year olds. In Zambezia, between January and July 1993, there were 58 deaths among the 2,700 0-3 year olds registered, 42 or 58% of which were due to diarrhea.

DIP and/or Revised Benchmark Objectives stipulated the following:

- Seventy-five percent of newborns would be registered in the project and weighed at least bimonthly for the first three years of life. Actual results of the final KAP survey show that 77% of infants between birth and two years had been weighed and measured within the past two months of the survey.
- Pregnant women would receive education on the nutrition and pregnancy principles mentioned above. This intervention was carried out and the impact is outlined below in 3) through 4). Although a pregnant-women supplementary feeding program was stipulated in the DIP, this program was prohibited by the MOHM as it did not support the national policy of separating food distribution from health care services.
- The original proposal for CSP in Mozambique stipulated that 90% of families with underweight children would receive AgPak seeds. This was attempted with families of all underweight (<80% wt./ht.) in 1992. Unfortunately, in spite of

careful explanations to village leaders regarding the principle of targeted seed distribution, many villagers were not able to accept the idea of some families receiving seeds while other families did not. Such chaos erupted during seed distribution that this intervention was suspended. Instead, families of severely malnourished children admitted to the center received a cereal or vegetable AgPak during appropriate planting seasons. One follow-up study of 400 such families who received seeds showed that 50% had planted gardens, while the other 50% had eaten their seeds as they had no food or land for gardening.

- This shows that the idea of distributing seeds to children of malnourished families is limited by (1) understanding/acceptance of non-recipient community members, and (2) availability of land and food for the recipients of seeds.
- Seventy-five percent of mothers of children under two would know correct weaning/infant feeding practices according to the June 1992 revised benchmarks.

*Initiation of Breast-feeding:* In the final survey, 91.1% of the mothers were breast-feeding, and as in the baseline survey, all had at some point breast-fed their infants under two. In the baseline, 73% had tried within the first eight hours after birth, while 86% had done so in the final evaluation.

*Exclusive Breast-feeding:* Seventy and one-half percent of mothers of 0-4 year olds were exclusively breast-feeding except for water (only 17.6% gave exclusive breast milk with no water); this was a marked improvement over the baseline KAP, where only 40% of mothers had not given their 0-4 month-old children porridge. Mothers were traditionally unwilling to give their infants the first milk or colostrum; instead, they gave them water which was not boiled. During the baseline, 57% who remembered gave water to their infants at less than one month and in 1993, 52.9% of the total under four months of age were receiving only water.

*Introduction of Foods:* The appropriate practice of introducing solid or semi-solid foods to infants at four to six months of age occurred with 94.9% of mothers interviewed during the final survey. This contrasts with the baseline KAP, where only 70% of mothers could remember starting the first traditional weaning food (porridge) to their infants by nine months of age.

A comparison of baseline and final KAP surveys shows that by the end of the project, 84.8% of mothers of 4-6 month olds started appropriate weaning foods. This was a clear improvement over baseline knowledge/practices of weaning. Although this cross-tabulation was not made for the baseline survey, individual weaning foods (porridge and protein) can be compared: 84.8% of 4-6 month olds were receiving high-energy and/or calorie-dense foods at the end of the project, compared with 26% at the start of the project. Thirty-six percent were receiving sources of protein such as meat, fish, beans, or peanuts, compared with 26% at the start of the project. Forty-eight and one-half percent started introducing Vitamin A, iron, and other nutrients from such sources as papaya, mango, pumpkin, and leafy green vegetables; this cannot be compared with baseline survey results.

The corresponding percentages for children 7-23 months were 94.1%, 90.3%, and 84.4%. These figures are in contrast to the baseline in which 70% of the mothers

never gave their children fruit, and 56% never gave protein (beans, eggs, meat, or fish).

The majority of mothers (73%) in the final survey knew that they should start adding other foods to breast milk in an infant's diet at four to six months of age; this knowledge question was not asked during the baseline KAP. Of the 27% of mothers who did not respond correctly in the final KAP, 9.6% believed that other foods should be added before four months, 4.4% believed it should be after six months, and 13.0% said that they did not know.

*Persistence of Breast-feeding:* Seventy-two and seven-tenths percent of mothers of 21-23 month-old children were still breast-feeding as a supplement to solid foods in June 1993. Ninety-two and seven-tenths percent of mothers were still breast-feeding their 20 month-old children. This question was not asked during the baseline KAP survey.

*Vitamin A:* Approximately half of the mothers could not name any food useful for preventing night blindness. Vitamin A was not listed as an intervention in the DIP; this question was used in the final KAP to serve as a baseline for extension of the project.

As of July 1993, the following growth-monitoring numbers and percentages were achieved.

Measure	July 1993 Number (%)	Cumulative Number (%)
No. of Children Weighed*	1,702	15,944
No. of Weighings	1,702	23,945
Underweight (<80% Wt./Age)**	842 (49.6)	10,370 (43.3)
No. of 2nd or More Weighings***	1,421	15,944
No. Who Gained Weight	1,134 (79.8)	12,728 (79.8)
No. Who Lost/Maintained Weight	287 (20.1)	3,216 (20.1)
No. Evaluated for Acute Maln.+ No. Acutely Malnourished (<75 Wt./Ht.)	1,702 28 (1.6)	18,698 683 (3.6)

- \* Number of Children Weighed = Number of individual children ever weighed in the program. No. of weighings describes the actual number of weighing events, and differs from number of children as one child may be weighed more than one time.
- \*\* Percent Underweight = Number of children found to be 80% wt./ht. divided by the total number of weighings.
- \*\*\* Children can only be evaluated for weight loss/gain when they have been weighed two or more times; therefore, the denominator to determine the percentage of who lost/gained weight is "the number of second or more weighings."
- + Reporting on children as acutely malnourished began one year after the project started. Therefore, the denominator to determine the cumulative percentage of children acutely malnourished is less than the total number of weighings.

Communities were mobilized by the water/sanitation engineer to construct ventilated pit latrines.

*To Whom:* Mothers of infants and children were the target audience for these teaching interventions. Health committees and community facilitators received ongoing weekly reinforcement of the principles taught during seminars. The entire community was the target for the wells and latrines.

*With What Results:* Some disagreements have arisen concerning boiled water. Authorities in ORT concur with the midterm evaluator who suggested that boiled water is not essential for the preparation of ORS.

*Diarrhea Incidence:* The results of the 1991 KAP survey showed that 74% of children aged two years or under experienced one or more episodes of diarrhea within two weeks of the interview compared with 51% in 1993. This difference may be accounted for by a seasonal effect or an increase in the proportion of households with access to protected water sources and latrines, project and MOHM educational efforts, or other factors.

*Diarrheal Management—Continued Breast-feeding:* Mothers' management of diarrhea showed considerable improvement over baseline results. Fifty-seven percent of mothers in the final survey continued breast-feeding their child with diarrhea at normal or increased levels versus 29% at baseline.

*Diarrheal Management—Continued Fluids:* An increase from 29% at the start of the project to 62% at the end was reported for giving usual or increased amounts of other liquids during diarrheal episodes.

*Diarrheal Management—Continued Foods:* An increase from 16.5% to 46% was reported for giving solid or semisolid foods during diarrheal episodes.

*Diarrheal Management—ORT Use:* The proportion of mothers who reported treating the diarrhea with an appropriate form of ORT (including cereal-based ORS, SSS, and ORS from a packet) increased from 6.5% to 56%. The proportion of mothers reporting use of anti-diarrheal medicines was unchanged and a greater percentage reported doing nothing to treat the diarrhea than at baseline.

Two-thirds of mothers reported that they sought advice or treatment for their child with diarrhea, of which the majority (74%) used the health center or hospital.

As of July 1993, the cumulative number of reported diarrhea cases was 362, and the number of deaths due to diarrhea was 42.

For 69.3% of the households, the primary source of water was an unprotected well compared with 53.7% in the baseline. Almost the same percentage had access to a protected well (30.4% in 1993 and 37.4% in the baseline). For 78.9%, the source of water was within one km, for 19.6% between one and two kms, and for 1.5% over two kms.

In the baseline survey, 93.9% had no latrines compared to 79.6% in 1993. However, by July 1993, the total number of latrines that had been constructed was 523, with 148 under construction.

*At What Cost:* Diarrhea in infants in Africa is the leading cause of death. The savings in person-lives of infants is considerable as is the reduction in energy depletion for the mother, a key wage earner in the African family.

The cost difference between ORT and medications for diarrhea is substantial; it requires no costs for professional expertise, and no costs for equipment and supplies such as IV bottles, transfusion kits, and solutions.

The cost of building latrines includes the labor of the latrine's owner. By using local materials, costly imported materials and the cost of transport and replacement were avoided.

### **3.4 Malaria Control**

*Who:* Nursing and training supervisors, team leaders and adjudantes were responsible for this intervention. Health committee members and volunteer community facilitators assisted in ongoing follow-up in the four pilot villages.

*Did What:* Malaria control was achieved through the following: use of mosquito nets, clearing of brush from courtyards of houses, covering pools of stagnant water with dirt, burning leaves, and removing garbage from household areas.

Teaching/learning methods such as songs, dance, skits, puppet shows, etc., were used to illustrate the relationship between the mosquito and malaria and its symptoms.

*To Whom:* The target audience for malaria control was the adult family and community members and leaders.

*With What Results:* Of the 270 mothers in the final survey, 86.9% believed that malaria was a major problem in their community compared with 88% in the baseline. About 27% in the baseline were practicing some form of prevention. In the final survey, 60% said they practicing some form of prevention. Of these, 46.3% burned leaves or cleared brush from around their household, 14.8% removed standing water (compared with 13% at baseline), 3.7% were using mosquito nets, and 2.6% were taking anti-malarial medication.

Mosquito nets were installed in all houses in two pilot villages. Villagers report less incidence of malaria and indicate that they are able to sleep uninterrupted during the night because of the protection of the nets.

*At What Cost:* At baseline, nearly 80% of children aged two or less had contracted malaria at least once during two weeks of the interview. In the 1993 survey, 35.9% reported malaria in their infants during the same time interval, a reduction of 40%.

Though some of this can be attributed to seasonal effects, the reduction of incidence of malaria during pregnancy cannot, as pregnancy transverses multiple seasons. A 27% reduction in mothers who had malaria during pregnancy was found between baseline and 1993 (70% to 43%).

These reductions save energy in infants who are in a period of rapid growth. By avoiding episodes of this debilitating disease, their body energy can be used in productive ways, to support physical, psychological, and social development.

For mothers who need their health and energy for pregnancy, lactation, and care of children, the opportunity costs are considerable.

### **3.5 Community Health Worker Training**

**Who:** Project staff, headed by a health education/training specialist provided initial and ongoing training. The specialist's efforts were enhanced through the involvement of other project staff, including the health officer, HIS officer, and temporary consultants.

**Did What:** The team developed a training unit for the project. They developed and/or adapted curricula, training methods, and audiovisual materials appropriate to the educational, cultural, and social situation of the population.

**To Whom:** The World Vision staff educated supervisors from the local community who in turn prepared team members who knew the local dialect and could communicate directly to the villagers.

**Training of Local People:** Staff trained included: technical World Vision and MOH staff, adjudantes, community facilitators, mothers of 0-3 year olds, pregnant women, women of childbearing age, the community in general, and health committees.

**Retraining of World Vision and MOH Nursing Staff:** Through refresher courses, supplementary knowledge and skills (AIDS, use of Vitamin A) were developed in areas unfamiliar to nurses.

**Training of Health Assistants (Adjudantes):** Each health team has one to four assistants, chosen from the target villages, who carry out different tasks. In all, 28 have been trained. The developed skills include: weighing and measuring children, data collection, participation in health education sessions, making flagstone latrine covers, and creating and modifying health education materials.

**Training of Facilitators:** Through the project, 64 (expected 130) locally chosen community facilitators have been trained and are currently under supervision. The staff trained these non-salaried volunteers who are capable of teaching nutrition and oral rehydration treatment and who have also been trained to promote health and well-being in their communities. The health committees in each barrio developed the selection criteria for these facilitators who serve 400-500 families.

**Training of Health Committees:** Village leaders of pilot villages are presented with teaching sessions on the meaning and importance of a health committee, as well as who should be a member. After this, the leaders and community select a committee of 12 members who undergo weekly teaching sessions on basic health problems, as well as how to identify and solve problems. The committee identifies village health problems and chooses locally attainable steps towards solving them. The committee chooses the community facilitators and in some cases supervise the facilitators' home visits.

**Training of Women Clients:** Each mother or WCBA received training during vaccination and growth monitoring rounds. Mothers are involved in counseling sessions which focus on growth, vaccination, and nutrition status of the child. Pregnant

women receive small-group teaching and individual counseling on pregnancy and postpartum health issues.

*Training of the Public:* Public education sessions were provided on Child Survival themes. Techniques for latrine construction as well as the health principles behind latrine use are taught to the heads of families. Villages who receive mosquito nets undergo a three-day group training about malaria causes and prevention that focuses on adults and older children.

*Development of Local Health Committees:* These committees consist of village members including village health worker, secretary, religious representative, traditional healers, rural water representative, teacher, agricultural extensionist, and community facilitators. These five committees with 38 members functioning in target areas have been actively involved in identifying and prioritizing community health problems, working with other sectors in the community, and implementing solutions particular to the issues at hand.

*Development of MOHM Staff:* Project staff interacted frequently with officials from the MOHM who noted with appreciation the frequency and helpfulness of these sessions and the role they play in keeping MOHM staff current with the field situation. MOHM staff were also included as part of the evaluation team, as they were seen as pivotal in ensuring ongoing monitoring for quality after the project funding stops.

*Development of Training Materials:* Teaching materials were produced on selected aspects of basic health care including diarrhea, breast-feeding/weaning, nutrition, malaria, AIDS, and vaccination). Culturally appropriate visual materials were created, pretested, and adapted to the educational level of the mothers.

*Forms for Community Facilitators:* Forms for the illiterate were developed using illustrations of health care concepts. These forms were revised through pilot tests to assess for reliability, utility, and scorability. They are used by the facilitators to record episodes of diarrhea and malaria in their village, as well as teach mothers about breast-feeding, weaning, nutrition, importance of vaccines, and need for latrines.

*Development of HIS Skills:* Dependable and effective vaccination/growth monitoring rounds have taught CSP target villages to expect and rely on these preventative health activities. Once CSP teams leave, villagers will be motivated to organize themselves for mobile vaccination teams or seek vaccination at the health post, given that the mobile teams or post provides effective care.

*Mechanism to Sustain Teaching:* The CSP staff instituted joint technical teaching meetings with the MOHM. This activity is sustainable once the project is terminated, as the meetings are run by Mozambican nurses. In addition, the information gained at these meetings should last beyond the life of the project.

*With What Results:* The most sustainable component of the project is the learning that has occurred because of the teaching that took place. Nurses and multipurpose workers (adjudantes) and members of the technical staff were exposed to seminars on teaching methods, group problem-solving, health committee formation, communication skills, exercises in planning, and preventative health care. Nurses have implemented what they learned by forming health committees in their villages, teaching communities

on the learned content, and teaching locally hired health assistants about vaccinations and growth monitoring.

The MOHM intends to implement a program in which the multipurpose workers would provide a fee for service to the community. In this regard, the current teaching activities of World Vision provides a baseline for the teaching that can be undertaken by the MOHM and in this way, provides a direct link with governmental plans for development.

*At What Cost:* The cost of the project is substantially lower than other similar projects because of the use of local personnel and the insistence on use of locally made materials and supplies.

- 4. Indicate which aspects of the sustainability plan the PVO implemented satisfactorily, and which steps were never initiated. Identify any activities which were unplanned, but formed an important aspect of the PVO's sustainability effort.*

*Community Ownership:*

*DIP:* Inputs and initiatives with community members and leaders would occur throughout the life of the project.

*Implementation:* This expectation was met through ongoing meetings with community leaders before initiating the project. This was done to enlist their support, and to confirm the appropriateness in training people who would later be integrated into the national health service.

*Institution Building:*

*DIP:* It was stated that the MOHM could not assume all activities unless the manpower deficit was addressed. The DIP stated that expatriates would be phased out at the end of the project.

*Implementation:* The challenge related to manpower continued throughout the life of the project. The persistent issue is that regardless of project efforts, the MOHM will be unable, due to severe financial constraints, to assume manpower coverage. Limited success has been achieved in that the MOHM has taken over the growth monitoring/vaccination element in two (6.3%) of the villages. Again, efforts to create and standardized protocols for maximum efficiency will continue. This will lower costs and maximize coverage.

*DIP:* The DIP indicated that health committees would start participating in projects that would produce income.

*Implementation:* This possibility was investigated after the Midterm Evaluation (August 1992) and the committees showed some interest. However, the World Vision Mozambique program director decided to defer this activity until the economic situation in Mozambique stabilized.

*DIP:* It was expected that cost-recovery methods would be encouraged, such as payment for vaccination cards.

*Implementation:* The practice of charging patients for services in the country was illegal, and thus this cost-recovery strategy was not attempted.

Communities which received mosquito nets were charged a nominal fee (20 cents) to heighten their appreciation of the value of the product. The community used the money to purchase machetes and shovels to clear brush and fill in swampy mosquito breeding sites.

It should be noted that the DIP indicated that no "phase-over" date of major project responsibilities to the MOHM could be established, as conditions in the country were too unstable to predict that date.

*Unplanned, But Important Activities:*

The health committees and community facilitators were created and sustained well, as exemplified by their activities which included initiating cleanup campaigns, home visiting, and group instruction of mothers. School health seminars, although unplanned, were held and seen as effective in transmitting health messages and teaching methodologies to primary schoolteachers.

5. *Did any counterpart institutions (the MOH, development agencies, local NGOs, etc.), during the design of the project (proposal or DIP), make a financial commitment to sustain project benefits? If so, have these commitments been kept?*

UNICEF committed to provide medical kits and vaccinations, and they have kept these commitments.

The MOHM, through their contractual agreement with World Vision, agreed to exempt World Vision of taxes and customs on all capital goods. Recently, the Ministry of Finance has indicated that they are planning to levy taxes and customs fees for the vehicles which are used exclusively by World Vision for project delivery of services.

6. *What are the reasons given for the success or failure of the counterpart institutions to keep their commitment?*

Currently, the Ministry of Finance, Mozambique, sees the six vehicles used by the project as excessive despite the fact that World Vision uses the vehicles exclusively for project purposes and has extended its outreach activities which require the use of the vehicles. Furthermore, some of the vehicles are used by the MOHM for the vaccination program.

**D. Monitoring and Evaluation of Sustainability**

1. *List the indicators the project has used to track any achievements in sustainability outputs and/or outcomes.*

See detailed responses in Questions C.3.1 through C.3.5.

2. *Do these indicators show any accomplishments in sustainability?*

See detailed responses in Questions C.3.1 through C.3.5.

3. *What qualitative data does the PVO have which indicates a change in the sustainability potential of project benefits?*

There were multiple examples provided during the observational visits to the field sites.

During a question and answer session in Mucelo Novo, one of the villages in which mosquito nets were distributed, a village health committee member was asked what he would continue to do after World Vision left. He replied that all families would continue to use the nets. They would burn leaves, bury pools of water near the house, and keep the area around the house free of garbage and shrubs. When asked what differences he noticed after the teaching about malaria prevention, he said that he noticed that less people got sick with malaria. In another village, a health committee member indicated that in the past he did not understand how people got sick with malaria. Now he did, and he knew what to do in the future.

In one village meeting, a traditional healer was asked what he used to prescribe for diarrhea. He responded that he used certain herbs which he no longer prescribed. Instead, he was recommending cereal-based fluids.

In all villages visited, songs were sung spontaneously with lyrics concerning World Vision's help in teaching and eliminating malaria, diarrhea, and measles. Health committee members from the village of Mugua noticed that there were no more cases of measles since the World Vision project had come to the village.

Women who were illiterate were now self-sustaining in carrying out door-to-door monitoring and tracking activities of growth monitoring. These activities reinforced the use of paper and pencil, recognition of symbols, the relationship between the spoken and written word, and the practice of recording from left to right. These prereading skills will serve these women well when literacy programs are initiated. Literacy rates, in turn, are highly correlated with positive childrearing outcomes.

The immediate and long-term benefits of a latrine on one's land was described best by a villager who had recently built one with the technical support of the World Vision water and sanitation officer. Standing proudly beside the structure, the villager indicated that he and his wife built the latrine so that he would prevent diarrhea and keep healthy. He went on to describe the flies contaminated with fecal material that is then deposited on food and causes diarrhea. He described the process by which the flies were trapped in the latrine and the manner in which he was able to keep the area clean.

A traditional belief of village women is that colostrum is not good for the infant. They refused to feed the infant upon delivery and in the early critical hours and days after the birth. Colostrum is an important substance for the newborn, as it provides natural immunity before the immunization schedule is initiated, is free of allergens, contains nutrients needed for growth, and is clean.

Mothers changed these practices and now breast-feed their infants, providing the essential protection and nutrients essential for early growth and prevention of infant illness.

Overall, the village experiences illustrated the increasing sophistication and development of social skills of village people who had few, if any, previous experiences with organized community health activities. These skills are essential if efficient, organized programs are to be sustained for large populations over an extended period of time.

Villagers throughout the project area were able to attend a stimulus (presentation, lesson, song, etc.) for 35-40 minutes, maintain their receptivity to information, create responses, provide examples of basic principles, share their knowledge with others, and ultimately change their behavior accordingly.

They demonstrated their ability to keep a commitment, appear as agreed, participate fully, and ensure surroundings that were conducive to teaching and providing care.

**4. *Identify in-country agencies who worked with the PVO on the design, implementation, or analysis of the midterm evaluation and this final evaluation.***

An initial three-year feasibility assessment was carried out in Mozambique. Representatives of World Vision worked directly with the MOHM to develop the DIP for Zambezia. During this period, World Vision staff lived on-site, and gained expertise in disaster management and relief and became familiar with the population, the culture, local values and practices, and relationships with other governmental and nongovernmental organizations.

World Vision, in close collaboration with the MOHM, completed the proposal after which project activities began. Nurses were hired to begin implementation and to revise the proposal as local conditions demanded.

The nursing staff explored further the current practices of the population, travelled throughout the provinces, and talked with those responsible at the district and provincial level concerning growth-monitoring activities and other MCH interventions. They spent considerable time talking with village members and leaders, establishing contacts, determining needs and expectations, and seeking commitment to project goals.

Local people from the villages helped to shape the program. Traditional healers (curandeiros) helped project staff identify the diseases of concern to the people, and helped to define and name them in the local dialect.

Initially, villagers assumed that since the government was interested, it would provide them with commodities and take care of them. This perception changed as both World Vision and the people worked together to empower the people to care for themselves, using local materials and expertise. As all have developed the project, all have been involved in its implementation and evaluation.

**5. *Did the PVO receive feedback on the recommendations regarding sustainability made by the technical reviews of the proposal and DIP? Did the PVO carry out those recommendations? If not, why not?***

The major recommendations were related to the nutrition element of the DIP, the use of mortality as an outcome measure, and the excessive cost of vehicles.

Evaluators could not identify clearly the providers responsible for developing and delivering nutrition education. In addition, the outcomes of this element were not specified.

From subsequent documents and observation, it is clear that the community trainers and assistants carry out the nutrition program. Specifically, they teach nutrition concepts through songs, examples, stories, and cooking demonstrations. These are remarkable to observe as all members of a village participate in the activities. They are orderly, patient, and obviously used to the teaching program being implemented. Villagers show their appreciation by dancing and singing for the team members.

**6. *Did the PVO carry out the recommendations regarding sustainability of the midterm evaluation team? If not, why not?***

The team members were well aware of the DIP recommendations, as they played an active role in their completion. Without question, they have worked diligently on the issues and recommendations cited.

The midterm evaluation provided an array of recommendations which project staff have noted and have worked to address with the population, collaborating agencies, and among themselves.

As the country, people, and political situation are evolving rapidly, the project strategies must remain flexible and open to change. For example, as areas become stable, the population will return to outlying areas which may necessitate changes in transportation costs and may require moving project activities to new centers of operation and training additional local personnel.

**E. Community Participation**

**1. *Please identify community leaders interviewed and indicate which group(s) they represent.***

Community leaders in Zambezia include members of the village health committee who are lay representatives elected by the community. Also included are representatives of the political and religious structures, traditional leaders and healers, members of the village women's group, the community chief, district and provincial health authorities, and youth representatives. This group includes young people from 15 years to the age before marriage. Also represented are family birth attendants who are family members and who are present at births.

**2. *Which Child Survival activities do community leaders perceive as being effective at meeting current health needs?***

The members of the village health committee indicated that, of all the health concerns taught to them, prevention of diarrhea was identified as the most important. One member of the committee felt that "this issue had to be recognized or there would never be an end to diarrhea in the village." They saw the development of their own roles as critical, in order to "set an example so that relatives and friends see what they are doing." The example of building a latrine was cited as a first step they could take to prevent diarrhea and to show leadership in their village.

Most leaders reportedly acknowledge the importance of growth monitoring and the use of mosquito nets to prevent malaria.

Some have questioned the credibility of the preventive program, as there is insufficient food resources, as waterborne diseases continue, and the lack of clinical care persists.

Some community leaders have objected to the perceived exclusive attention paid to women and children. This issue was addressed during an observed community-level teaching experience. The women sang the song to the men and the men, who also attend the sessions, sang the song to the women. In addition, the cooperation of men has been sought in organizing and mobilizing the community. While a few do not see any inherent value in these actions, some do and attitudes continue to change.

Both the team members and the villagers expressed the need to have faith in the system, to be confident that supplies and services will be forthcoming so that people in turn can trust and use the system.

**3. *What activities did the PVO carry out to enable the communities to better meet their basic needs and increase their ability to sustain effective Child Survival project activities?***

World Vision worked actively to identify the concerns of villagers and the representatives of the MOHM at all levels. They focused on immediate concerns such as diarrhea, preparing nutritious food, and building latrines. Identifying and treating illnesses were priorities followed by activities aimed at health promotion and disease prevention.

World Vision's operations and documentation and their compliance with MOHM at the various levels of reporting persist as concerns. While data collection at the local level was time-consuming and compromised the workers in their teaching, the actual use of the data at higher levels was not always clear.

**4. *How did communities participate in the design, implementation and/or evaluation of Child Survival activities?***

Initially, some men in community leadership positions saw no benefit for the men of the villages, and consequently, no one appeared for health care. Upon further discussion, these concerns were identified and the village's participation increased significantly.

Some design elements did not lend themselves to community participation. But when they did, the project staff seemed open and flexible. Debate continued throughout the evaluation of the role the mobile teams should play vis-a-vis the health post. World Vision staff and the local health authorities worked on several models and agreed to continue discussions. Community participation was sought on scheduling issues such as deciding where rounds should be carried out within the village. Considerable participation occurred in the training of facilitators and health committee members.

A major strategy of the project which distinguishes it from other projects is its horizontal (as opposed to vertical) structure. The project planners insisted that the

project be integrated into ongoing relief and rehabilitation activities rather than using scarce resources for limited vertical efforts.

5. *What is the number of functioning health committees in the project area? How often has each met during the past six months? Please comment on whether committee members seem representative of their communities.*

There were four health committees in the project area which met twice each month (See Question E.1). They represent all the major groups in the project area except the schools. Currently, few schools are in operation. However, school representation has been ensured since some members of the health committee members are teachers.

6. *What are the most significant issues currently being addressed by these health committees?*

From documentation and verification through observation, the following consistently identified elements are being addressed: prevention of diarrhea and malaria, evaluation of mosquito nets, building latrines, and developing an approach to commit men to community development activities.

7. *What resources has the community contributed that will encourage continuation of project activities after donor funding ends?*

The community has been most generous in giving its time to project activities, and by so doing, has gained knowledge and skills that can continue after donor funding ends. Communities provide meeting places, attend sessions on health issues, and mobilize the community to participate and act.

Community members have built 523 latrines in two years, and have developed and revised their teaching materials and skills which can be used long after project funds are no longer available. Most importantly, a cadre of community leaders has been empowered to lead the community to better health practices. The pride these leaders demonstrated was evident throughout the sites visited. Local people assumed considerable responsibility for implementing the project's activities, and should be able to continue to do so with adequate supervision and continued leadership.

8. *What are the reasons for the success or failure of the committees to contribute resources for continuation of effective project activities?*

The committees, the community, and the families are extremely poor. They own almost no possessions. Many own one piece of clothing which is often torn, oversized, and in shreds. They provided team workers with in-kind contributions of fruits and vegetables, and insisted on their accepting these gifts. These actions occurred despite a two-year drought in which practically no food was grown and available for in-kind exchanges. The exchange exemplifies the community's willingness to contribute, if it has the resources to do so.

F. Ability and Willingness of Counterpart Institutions to Sustain Activities

1. *Please identify persons interviewed and indicate their organization and relationship to the Child Survival project.*

The MOHM is the host country and is organized at the national, provincial, and district levels. The MOHM is responsible for setting national health policy, implementing, monitoring, and evaluating the nation's health programs, and supervising health personnel.

As the host country agency, the MOHM is responsible for developing, implementing, monitoring, and evaluating the program vis-a-vis its national policies, goals, and targets.

Save the Children carries out continuing education programs throughout the year for health providers, including MCH and basic nurses. This organization is reportedly receptive to World Vision ideas, and has requested technical and commodity support of World Vision.

UNICEF has been involved with World Vision at the provincial and national level through participation in coordinating meetings and in providing the vaccines for the immunization element of the project.

2. *What linkages exist between the Child Survival project and the activities of key health development agencies (local/municipal/district/provincial/state level)? Do these linkages involve any financial exchange?*

*National:* Linkages with the Mozambique Ministry of Health was established and maintained throughout the project through a signed contractual agreement.

*International:* Médecins Sans Frontières (MSF) established a verbal agreement with the project authorities and with the MOHM. The goal of the agreement was to rehabilitate the rural hospitals and clinics, essential parts of the health infrastructure in sustaining primary care delivery in various districts of Zambezia Province. MSF is a key partner in delivering services and in providing supervision of curative and preventative services in other districts. In addition, it offers technical and logistical assistance, air and land transport, and training. MSF also established a supplementary feeding program to severely malnourished children in other districts besides Nicosadala, which effort is in concert with the project's goals and related to its outcomes. Save the Children (UK) initiated and continues to offer in-service training courses for health staff through its Health Workers Retraining Centre established in Zambezia. This effort also supported the project's efforts related to training of health personnel.

The Departamento de Prevencao e Combate das Calamidades Naturais (DPCCN) collaborated in providing food commodities to displaced people. Its system of prioritizing food distribution supported the project's efforts to identify and care for high-risk infants and their families.

3. *What are the key local institutions the PVO expects to take part in sustaining project activities?*

World Vision has conducted several training sessions at a local school for primary schoolteachers. Sessions on diarrhea and cholera prevention and management were given to prepare the schoolteachers to teach these basic health care principles in their classrooms.

As indicated above, the project needs to involve the school and the churches and develop child-to-child activities. Some research has demonstrated the efficacy and effectiveness of educational activities directed at school-age children, as this group is often responsible for the care of younger siblings. In addition, these children become parents at early ages, and early education in health practices would fare them well in the raising of their own children.

4. *Which Child Survival project activities do MOH personnel and other staff in key local institutions perceive as being effective?*

One of the project elements discussed by the Vice-Minister of the MOHM found the malaria initiative to be the most effective. Although the project team and MOHM officials had to review this element and its policy and implementation approaches several times, the decisions to move to less-resistant anti-malaria prophylaxis and to use of mosquito nets have proven effective. These approaches are simple, cost-effective, and can be used in other geographical locations.

Officials at the MOHM also view the collaboration developed between World Vision and the MOHM as a key factor in the project's success. The officials view the policies, activities, and mechanisms used by World Vision as consistent and in harmony with those of the country, and in keeping with the transfer from an emergency to a development environment.

5. *What did the PVO do to build skills of local MOH personnel or staff of key counterpart NGOs? Did they teach them to train CHWs, or manage Child Survival activities once A.I.D. funding terminates?*

Initiatives were launched to develop or reinforce skills of counterparts at all levels of government, and these initiatives have been recognized and applauded by the MOHM. For example, project staff held joint seminars on selected topics (cholera, community teaching methodology) with other organizations to which MOHM personnel were invited. Frequent consultations were held particularly at the district and provincial levels where an increasingly decentralized health system has been evolving. World Vision has been training community facilitators and by so doing, has enhanced the teaching and managerial capacity within each facilitator's areas of expertise. Nurse educators have met once every three months for one week of in-service education. Two or three people from the MOHM attend these sessions. These include community health people in charge of the district, an MCH nurse supervisor, and a district health officer.

6. *What is the current ability of the MOH or other relevant local institutions to provide the necessary financial, human, and material resources to sustain effective project activities once CS funding ends?*

An outstanding policy of the project was the practice of using, wherever possible, local materials and local personnel, two elements which account for much of the recurrent costs.

Project staff insisted that villagers develop skills in preventing, say, malaria instead of relying exclusively on medications and costly referrals to hospital. Every staff member was acutely aware of the MOHM's precarious position. Given the level of the GNP and the amount provided to the health sector (.05% of the GNP, according to some reports), the MOHM in all probability will not be able to sustain all the project activities after the project ends.

However, given World Vision's policies and practices, considerable work can be accomplished by the following groups. The existing MOHM personnel will be able to maintain activities related to growth monitoring, vaccination, and community facilitation. The health committees can continue to provide leadership and encourage continuation of community health-related activities. The villagers themselves can continue with their programs of building latrines, malaria control, prevention of diarrhea, and breast-feeding/weaning practices. Finally, the local nurses from the MOHM can continue supervising growth-monitoring activities.

7. *Are there any project activities that counterpart organizations perceive as effective?*

A direct measure of counterpart organizations' views of World Vision activities is best assessed through their requests to the project.

The MOHM sees the project malaria efforts as a success. It also views the educational program as effective and has requested intensified efforts, particularly in teaching managerial and supervisory skills to MOHM personnel. In addition, the MOHM has requested support in streamlining the protocols so that routine activities can be carried out well by local staff.

Save the Children has requested World Vision assistance in developing teaching methods.

Agua Rural has asked World Vision to provide coaching in the knowledge and practices of changing attitudes and in motivating personnel. They have consulted with project staff which has shared with them findings from surveys which identified optimum locations for the construction of wells.

The Department of Agriculture has requested World Vision technical support in teaching its personnel about nutritious foods.

The Italian Cooperation has collaborated with World Vision in developing sites for the rehabilitation of health posts.

Interviewed project staff view the policies and practices of World Vision as effective in that local people were employed, thus providing ongoing education, employment, and reduced project costs. In addition, they applaud World Vision's insistence on

using locally grown food and materials to develop the community and its health program.

#### **G. Project Expenditures**

*1. Attach a pipeline analysis of project expenditures.*

A pipeline analysis of project expenditures is shown in Appendix C.

*2. Compare the budget for planned expenditures identified in the DIP with the actual expenditures at the end of the project. Were some categories of expenditures much higher or lower than originally planned?*

Overall, the planned expenditures are consistent with the actual expenditures as of July 1993. Some differences between planned and actual occurred for some line items, both above and below expectation. The final budget is somewhat under projected costs for the last budget period.

*3. Did the project handle the finances in a competent manner?*

World Vision employed the auditing firm of Coopers and Lybrand to conduct an audit of project funds and practices. The firm recently conducted its evaluation on-site and will forward the results to World Vision when completed. The results of this audit were not available for inclusion in this report; however, during a verbal debriefing, positive results were reported.

*4. Are there any lessons to be learned regarding project expenditures that might be helpful to other PVO projects, or relevant to A.I.D.'s support strategy?*

See response to Question F.7.

Most importantly, staff view the project as dynamic and are willing to change their approach to best meet the needs of a moving population and a rapidly changing political and social situation.

#### **H. Attempts to Increase Efficiency**

*1. What strategies did the PVO implement to reduce costs, increase productivity, or make the project more efficient?*

As indicated above, local staff were hired, local materials were used, motorcycles rather than automobiles were used when and where possible, duplicated rather than purchased forms were used for MCH family folders, simple Salter scales and wooden measures were used for growth and development weighing and measuring, sturdy but inexpensive mosquito nets were purchased from Thailand, nets rather than costly sprays were used for malaria control, and local food was used to enrich and fortify infant and adult food.

The staff also used the expertise of other agencies to maximize the resources required. For example, they worked closely with the agricultural experts to grow the most nutritious foods possible in the area.

2. *What are the reasons for the success or failure of the attempts to reduce costs, increase productivity or efficiency of this project?*

As indicated throughout this report, efforts made included; using health posts instead of mobile vans which required transport; using locally made materials over importing costly foreign materials; hiring local rather than expatriate staff; and relocating health posts to decrease travelling distances to and from work sites.

3. *Are there any lessons to be learned regarding attempts to increase efficiency that might be applicable to other PVO Child Survival projects or to A.I.D.'s support of these projects?*

The midterm evaluation cited the need to streamline the process of registering and recording information. Consideration might be given to using additional adjudantes who could record data so that others better trained could spend more time interpreting the results to the mothers, and counseling and teaching the mothers about their infants and the relationship between nutrition, disease, and growth- monitoring results.

Moving closer to the target population might reduce travel, petrol, wear and tear on vehicles, and loss of time and energy of the staff.

#### **I. Cost-Recovery Attempts**

1. *What specific cost-recovery mechanisms did the PVO implement to offset project expenditures? If cost recovery was part of the project, who managed implementation?*
2. *Estimate the dollar amount of cost recovery obtained during the project. What percent of project costs did this revenue cover? Did the cost-recovery mechanisms generate enough money to justify the effort and funds required to implement the mechanisms?*
3. *What effect did any cost-recovery activity have on the PVO's reputation in the community? Did the cost-recovery venture result in any inequities in service delivery?*
4. *What are the reasons for the success or failure of the household income-generating activities of this project?*
5. *Are there any lessons to be learned regarding cost recovery that might be applicable to other PVO Child Survival projects or to A.I.D.'s support strategy?*

No major cost-recovery mechanisms could be used, as the country, province, and villages were in a famine and war emergency situation. Populations moved as attacks occurred and hundreds were seeking refuge in areas where they did not own land, were unable to work the land, and were not eligible for food rations.

These expectations may not be applicable to regions which experience the catastrophic conditions experienced by the project staff and recipients of care.

#### **J. Household Income Generation**

1. *Did the project implement any household income-generating activities?*
2. *Estimate the dollar amount of income added to a family or household's annual income, as a result of the income-generating activities of the project.*

3. *Did the revenues contribute to meeting the cost of health activities? What percentage of project costs did income generation cover?*
4. *Are there any lessons to be learned regarding household income generation that might be applicable to other PVO Child Survival projects or to A.I.D.'s support strategy?*

The DIP indicated that income-generating activities would be explored to generate funds to maintain recurrent costs in transport, training supplies, stipends, and immunization supplies. Mothers were to be assisted in planting vegetable gardens and producing supplemental food for their families and providing extra money for the families' other needs.

The midterm evaluation also underscored the need for income-generating projects in order to improve the quality of life of the people.

However, several events and conditions prevented the implementation of these activities. These included the ongoing civil war, disruption of family life, a severe two-year drought, dislocation of families, and the inability to use farm land because of this dislocated status. Reduced intake of food and the constant need to look for food were factors which inhibited the development of self-sustaining generation of income.

It should be noted that Milange Village demonstrated considerable creativity in creating income. Instead of cutting wood and burning it, men in Milange converted it to coal and sold the product on the main highway. These villagers' overall superior health status, hygiene, and dress were evident when compared to other populations in other districts in the project area.

The health officer plans to spend time during the next cycle exploring possible income-generating projects. She has identified several possible products, including small crafts such as pots, baskets, and mats; carpentry; and the managerial processes related to production, transportation, and marketing.

## **K. Summary**

1. *Please give a brief (no more than one-page), succinct summary of the responses to the previous questions concerning:*
  - *The project's accomplishments (in terms of outputs and/or outcomes) in enabling communities to meet their basic health needs (as they relate to Child Survival) (in general) and in promoting sustainability of effective Child Survival activities.*
  - *The project's competence in carrying out its sustainability promoting activities.*
  - *Any lessons to be learned regarding sustainability that might be applicable to other PVO Child Survival projects, and/or relevant to A.I.D.'s support of these projects.*

The overall objective of this three-year project was to reduce infant mortality and morbidity of children under the age of five through a comprehensive MCH program and expansion of the Ministry of Health PHC services at the village level.

After successfully identifying the needs and expectations of the community, governmental authorities, and local religious and social groups, five elements were implemented: 1) immunizations; 2) nutrition improvement and promotion through growth monitoring, improved breast-feeding and weaning practices and nutrition for mothers; 3) oral rehydration therapy (ORT/control of diarrheal diseases); 4) malaria control; and 5) community health worker training.

Forty-seven local staff were hired and retrained by one and one-half project staff members who implemented the project in 24 village sites. Methods used to meet project goals and objectives were weighing, measuring, and providing immunizations to infants 0-36 months and to pregnant women and women of childbearing age, providing nutrition education, referral services for at-risk infants and mothers, teaching and supervision of breast-feeding and weaning practices, use of ORT, teaching and care for diarrheal diseases, providing technical assistance for building latrines, preventing malaria by providing mosquito nets and teaching prevention practices, and training of a cadre of health personnel for MCH activities.

Collaboration was effective with district, provincial, and national MOHM staff and with other international organizations in sustaining project activities. These organizations have since requested technical and commodity support from World Vision.

Ongoing, formative and mid- and final evaluations were conducted. Project accomplishments included impressive changes in the percentage of infants and mothers who were immunized, the low number of reported diseases related to immunization type, and positive changes in behavior in villagers concerning participation in community health committee, attendance at growth-monitoring and health education sessions, participation in a pilot malaria control program (100% use of mosquito nets), building of 524 latrines and eight wells, change in practices related to infant feeding and weaning, and diarrhea management. Traditional practices of discarding mothers' early milk were changed and nutritious weaning foods were used over the earlier practice of feeding exclusively with water.

The lessons learned from this project relate to the impressive number of local health providers retrained and employed at costs significantly lower than those required when using international staff. The project's sustainability was also enhanced through policies and practices which focused on prevention rather than cure, and on using local rather than foreign materials.

Villagers reported fewer cases of measles and malaria, and only one neonatal death was reported during the last two months the project was in operation. These observations serve to enhance the sustainability of the project after funding is withdrawn.

**2. *Attach a list of all members of the final evaluation team and indicate institutional affiliation.***

The People of Zambezia Province, Mozambique:

- I. Cossa, Nutrition, MOHM
- J. Chambule, Epidemiology, MOHM
- I. Joao Ausse, Community Health Officer, Provincial MOHM

Timothy Andrews, Project Administrator, World Vision  
Theresa Andrews, M.D., National Associate Director of Health Projects, World Vision  
Heather Waye, RN, Health Officer, World Vision  
Anne Henderson, RN, M.P.H., Health Officer, World Vision  
Bernie Simacio, RN, M.P.H., Health Officer, World Vision  
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M. Roche, M.D., PHC, USAID  
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M. Salato, Director of Continuing Education, Provincial MOHM  
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APPENDIX A

CALCULATION OF OPERATION RATIO  
TO DETERMINE COST OF VACCINATIONS PER PERSON

Needles/syringes	\$6,753
Personnel: 4 technicians x \$300/22 days x 16 days x 50% time = \$436/mo. = \$5,236/year	5,236
4 assistants x \$30/22 days x 16 days x 50% time = \$43.60/mo. = \$436/year	436
Total Cost/Year	\$12,425
Persons:	
Children	3,374
Women	2,867
Total persons	6,241

$\$12,425/6,241$  (women/children) = \$1.99 per woman or child vaccinated.

## APPENDIX B

### CALCULATION OF OPERATION RATIO TO DETERMINE COST OF GROWTH MONITORING PER PERSON

Personnel  
12 assistants x 16 days x 80% of time  
x \$30/22 days = \$208/mo. = \$2,496/year \$2,496

Children wt/meas/year 2,933

$\$2,496 / 2,933 = \$.85$  per birth to two years old to be weighed/measured  
6-12 times per year.

1993 ANNUAL REPORT FORM A: COUNTRY PROJECT PIPELINE ANALYSIS  
W.V.R.D./PROJECT NAME: ZAMBESIA CHILD SURVIVAL PROJECT  
GRANT #: 656-0217-G-0014-00

Actual Expenditures To Date  
(07/01/90 to 9/30/93)

Total Agreement Budget  
(Columns 1 & 2)  
(10/01/93 to 12/31/93)

Projected Expenditures Against  
Remaining Obligated Funds  
(07/01/90 to 12/31/93)

BUDGET CATEGORY  
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	A.I.D.	W.V.R.D.	TOTAL	A.I.D.	W.V.R.D.	TOTAL	A.I.D.	W.V.R.D.	TOTAL
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Personnel	357,973	138,840	496,813	302,078	10,000	312,078	(55,895)	(128,840)	(184,735)
Travel/Transport	122,518	42,166	164,684	150,750	10,000	160,750	28,232	(32,166)	(3,934)
Supplies	64,025	102,823	166,848	69,070	125,000	194,070	5,045	22,177	27,222
Other Direct Costs	27,658	19,710	47,368	18,747	0	18,747	(8,911)	(19,710)	(28,621)
Training/Tech. Asst.	30,628	18,541	49,169	26,533	32,758	59,291	(4,095)	14,217	10,122
Evaluation/Audit	6,909	8,479	15,388	42,533	0	42,533	35,624	(8,479)	27,145
Equipment	0	121,887	121,887	0	125,000	125,000	0	3,113	3,113
Total Direct Costs	609,711	452,446	1,062,157	609,711	302,758	912,469	0	(149,688)	(149,688)
Indirect Costs (20%)	121,556	66,499	188,055	121,556	35,552	157,107	0	(30,947)	(30,947)
Total Costs	731,267	518,945	1,250,212	731,267	338,310	1,069,576	0	(330,323)	(330,323)
	=====	=====	=====	=====	=====	=====	=====	=====	=====