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## **LESSONS IN TETANUS ELIMINATION REVISTED**

**WORKING PAPER: 11**

**January, 1992**

PIT-ABN-888

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**Report Prepared for  
The Agency for International Development  
Contract #DPE-5966-Z-00-8083-00  
Project #936-5966**

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## **I. ABSTRACT**

Neonatal tetanus takes the lives of an estimated 441,000 newborns annually, despite the availability of an effective vaccine to prevent it. In the mid-1960s, the Albert Schweitzer Hospital (ASH) in Haiti's Artibonite Valley treated some 500 cases of neonatal tetanus annually. This article describes ASH's successful efforts to eliminate neonatal tetanus through a series of innovative hospital- and community-based activities.

In this effort, ASH employed many techniques that later became associated with social mobilization, social marketing, rapid assessment, ethnography, community mobilization, and cost analysis. The ASH program provided effective and convenient services for which the public felt a strong need, powerfully and sensitively promoted the services, and utilized community resources both for service promotion and provision.

Other important factors contributed to success. The fund of goodwill and trust which the hospital had built through years of service greatly facilitated the community health outreach team's ability to cover the population of women in the hospital's district of 150,000 persons. In addressing the problem of neonatal tetanus, the hospital leadership followed basic public health principles extremely well and took an incremental, problem-solving approach. The program successfully mobilized community resources and cooperation and over time incorporated complementary strategies. The staff utilized information effectively, to garner support for the program, to plan an effective program, to motivate health staff, to guide program adjustments, and to monitor program progress. Both staff and community members were highly motivated to act, in large part due to the ubiquity of neonatal tetanus deaths. The folk health system was not only not antagonistic but was in fact extremely supportive.

## II. INTRODUCTION

### A. Neonatal Tetanus and Its Prevention

Tetanus takes the lives of an estimated 441,000 newborns annually, despite the fact that knowledge about how to prevent the disease has been present for many years (WHO, October 1991). The causative organism, *Clostridium tetani*, is ubiquitous in nature and commonly found in soil and in the fecal matter of animals and man. Because it is anaerobic, it causes little problem until it is introduced deep within a wound, where air cannot penetrate. Once there (as for instance within the umbilical cord stump), it multiplies and produces a potent neurotoxin that causes severe, prolonged spasms in all voluntary muscles, with the slightest stimulation. The masseter (jaw) muscle is particularly affected, causing such severe spasms that the disease, in English, is commonly called "lockjaw."

In developing countries, the disease may be more commonly known as "the malady of the eighth day of life," indicating its propensity to affect newborns. Case fatality rates are usually 60-90% even when the disease is treated (Stanfield and Galazka, 1984; Galazka and Stroh, 1986). So common is death from this disease that demographers often suspect that neonatal tetanus (NNT) is the cause of any excess of deaths between the eighth and 15th day of life.

The major program options for preventing NNT are to improve hygienic birth practices and to immunize women against tetanus. While the former is not as effective as immunization in decreasing the incidence of neonatal tetanus, its potential to reduce overall neonatal mortality may be greater (Rahman 1982).

Milestones in the use of immunization against NNT were publications by Schofield (1961), who used fluid toxoid to show that immunization during pregnancy would protect the newborn, and by Newell (1966) who showed that women who had three doses of alum-precipitated tetanus toxoid produced babies who did not acquire neonatal tetanus. Newell targeted non-pregnant women with three doses and showed that adequate circulating antibody was present five years after the third dose.

Worldwide, tetanus toxoid coverage levels of women in their reproductive years remains low: in 1990, 39% of pregnant women in developing countries had received at least two tetanus toxoid doses (WHO, October 1991), as compared to 70% or higher immunization coverage rates for children (WHO, January 1991). Women who bring their infants and children to receive multiple antigens may find that the health care system has not yet geared up to immunize mothers themselves. The fact that the cost of immunizing a mother is minuscule compared to that of treating another case of tetanus may mean very little to officials in countries where babies with tetanus die at home, unknown to the health care system.

### B. Birth in Rural Haiti

Birth in rural Haiti has apparently long been attended by potentially deleterious practices, especially regarding the treatment of the umbilical cord stump (Berggren et al., 1983). The earliest records of tetanus among African slaves in the New World comes from archives in Paris, where British historian C.L.R. James found that Parisian physicians visiting Haiti in the 1700's noted "a mysterious jaw sickness" that took the lives of fully one third of "babies of slaves born at the hands of black birth attendants." This disease claimed its victims by about

the eighth day, their jaws being "fixed" in such a way that suckling was impossible (James, 1962).

Like many women in developing countries, Haitian mothers in rural areas give birth at home in small, mud-walled dwellings, often on a mat on the floor, which may be of packed earth or cement. Usually a traditional birth attendant (TBA, known as a "matronne") is called late, when labor pains are well established. The mother delivers in a semi-seated position on the mat, supported by her husband or a relative who follows the instructions of the matronne. Teas or other potions are sometimes administered to speed the labor. The TBA observes the contractions of the uterus, usually without resort to vaginal or rectal examination until the "crowning" or visualization of the head occurs. An untrained matronne may use dirty rags to clean the puerperal area, an understandable process since the mother may inadvertently pass feces with the delivery of the head of the baby. Deliveries often take place at night, and in any case behind closed doors; therefore, the matronne works by the light of a candle or a kerosene lamp, and in this semi-darkness she must cut and tie the umbilical cord.

Marshall (1968) describes the care of the umbilicus of newborns: Haitian tradition dictates that a poultice must be prepared to "guard the doorway" (the umbilicus), and if the matronne does not apply such medicine, it is likely that the grandmother or a well-meaning relative will do so even after the departure of the TBA and (in the case of a trained matronne) despite her admonitions to the contrary. The poultice may contain charcoal scraped from the bottom of a pot, candle wax, beeswax, spider webs, or burnt straw. Furthermore, there is a strong belief in some parts of Haiti that the umbilical cord stump must "fall off" by the seventh day of life, so that there may be manipulation of the stump by the family members as they bathe or otherwise care for the child.

Another adverse practice is that of vigorous removal of the vernix caseosa, the white cold-cream like substance which covers newborn skin. Such practices help to explain the occurrence of tetanus due to contamination of the umbilical cord area, even though a trained matronne may otherwise have carried out her job very well. Tradition dictates that the vernix substance must be removed, preferably with water, which is often cold and usually contaminated. Newborns are industriously scrubbed by a family member while the matronne attends to the delivery of the placenta. When she returns to the baby, contamination may have occurred.

### **C. Early Work with Traditional Birth Attendants in Haiti**

To counter these practices, work with TBAs was begun in earnest after World War II, when UNICEF-backed projects trained and equipped TBAs with delivery "kits". UNICEF's objective was to begin to provide "safe deliveries" for as many women as possible. But training of TBAs remained a small-scale practice in Haiti and in other developing countries until the late 1970's.

Haitian matronnes were among the first to be trained in a project supported by the Pan American Health Organization (PAHO) in the early 1950's. UNICEF "kits" (metal boxes with basic equipment for a clean delivery) were provided to matronnes who completed the training program under mixed government and private auspices.

It was intended that the above project would be replicated through government rural health centers, hospitals, and maternities scattered throughout Haiti. But with rare exceptions, the

program was dropped within a few years of its inception due to lack of funds and supervision, and a rapid turnover of rural staff, many of whom were unfamiliar with the project.

In 1976, the Ministry of Health's Family Health Division resurrected training programs for TBAs and developed a manual for training under the direction of Dr. Adeline Verly. Matrones themselves, however, insisted that families had to be trained as well as themselves if practices leading to tetanus were to be eliminated. Confronted with the difficulty of assuring hygienic births, the Family Health Division decided to teach matrones about the importance of immunization as the main means for preventing tetanus (Allman, 1986).

### III. METHODS

#### A. First Phase: Hospital-based Program

The Albert Schweitzer Hospital (ASH) in Deschappelles, Haiti, has published the largest series on record of treatment of cases of tetanus of the newborn (Marshall, 1968). When the hospital opened in 1956, less than two dozen cases of NNT were admitted annually (Earle and Mellon, 1958). By 1966-68, these numbers had grown to 400-600 cases, with a 50 percent case fatality rate. Retrospective pregnancy histories revealed that the great majority of mothers, by the time they reached age 35, had lost one or more babies from tetanus. As soon as Newell's work was published in the 1960's, the ASH staff acted swiftly to begin immunizing pregnant women in the antenatal clinic with three doses of tetanus toxoid. By 1967, ASH had taken additional measures:

- o recruitment and training of traditional birth attendants in safe and hygienic birthing techniques and umbilical cord care;
- o the production and frequent utilization of a film about how to prevent tetanus of the newborn;
- o provision of a "no-cost to client" umbilical cord dressing program at the hospital's outpatient clinic, offered to parents whose babies were born at home; and
- o passive immunization with tetanus antitoxin of newborns whose mothers had not been immunized.

Despite these activities, the number of admissions for tetanus of the newborn appeared to increase (Berggren, 1974; Berggren and Berggren, 1971).

#### B. Planning Activities to Combat Neonatal Tetanus

In 1967, ASH staff hired two community health practitioners (including the principal author) to study the problem of the increasing numbers of admissions for NNT and to develop a program to combat it. A community health outreach program initiated in 1967 added new activities, including immunization of all women in the reproductive age group with three doses of alum-precipitated tetanus toxoid at monthly intervals. To plan the program to combat tetanus, the community program undertook the following steps, several of which were quite innovative for their time (Berggren, Ewbank, and Berggren, 1981).

- ◆ **Review of hospital and government health statistics.** Findings included the fact that half of the cases were occurring in babies from outside the hospital's normal catchment area and the remainder from un-immunized women inside the hospital's "district" of about 150,000 people. Furthermore, many babies were still being delivered by untrained birth attendants, and few mothers would or could attend antenatal clinics frequently enough to receive the required three-dose regimen recommended as adequate to prevent NNT. (In fact, today the World Health Organization recommends five appropriately-spaced doses for protection throughout the childbearing years; two doses given at least four weeks apart confer protection for three years. Doses can be given before or during the childbearing years, regardless of pregnancy status. [WHO, 1988].)

- ◆ **Rapid ethnographic assessment of local midwifery practice and immunization at market places.** Interviews with previously trained TBAs gave valuable insights into their practices. Once a matronne had participated, she recognized newborns' vulnerability to tetanus. Hence the idea of preventive "piki" ("pique", or injection) appealed to TBAs who spontaneously asked not only for information, but to be immunized themselves. These interviews in groups are today called **focus group discussions**.

Local **key informants** gave detailed information about the marketplace practices of local Haitian women and their propensity to attend at least one outdoor marketplace per week, arriving at dawn in order to sell surplus agricultural products. They said women would sometimes arrive the night before a major market day to make sure they had a stall or a good place to sell, because activities begin at dawn. Informants were doubtful, though, about the feasibility of giving immunizations at a marketplace, warning about the disorganization which might occur, and doubting whether women would come back for second and third doses.

The former mayor of one of the major towns volunteered a plan to help. After the first immunization clinic at a market place, she would ask questions to see if the women understood why the vaccination was offered, how many doses were to follow, and whether women understood the necessity of bringing their immunization record card to future clinics. This activity was similar to the **missed opportunity surveys** and **exit interviews** now used commonly by immunization and other programs.

- ◆ **A study of the possibility of mobilization of both formal and informal health systems.** The informal health system in Haiti posed no barriers to an immunization campaign, partly because of the successful campaign of "Papa Doc" (Haiti's president at the time) against yaws. Rural Haitian families remembered the scourge of yaws and the "piki" which stopped it. Furthermore, healers in the villages of the Artibonite Valley knew the hopelessness of treating NNT, a disease often attributed to the "loogaloup", or werewolf, an evil spirit which is thought to suck out the life of a child, causing it to grimace in horrible convulsions. In fact, as it turned out, many of healers, both male and female, looked forward to being immunized themselves and would lead the way, thus protecting themselves against a disease that brought them little remuneration since it could not be successfully treated.

Nearby government authorities were aware that the Schweitzer Hospital carried a tremendous burden of NNT cases. Although skeptical about the value of immunization of women to prevent NNT (an idea which had only begun to appear in French journals), they had no objections either to a marketplace campaign or to the possible plan of developing "rally posts," or assembly points where both mothers and children could be immunized. Health authorities in Haiti were well aware of the successful campaign against yaws which involved giving penicillin shots at assembly points, but the idea had not yet been appropriated as a strategy for other services.

Engaging the ASH staff in a concerted effort against NNT required **participatory learning techniques**. Facts and figures had to be marshalled and presented in a convincing manner in order to have the medical staff "buy into" the preventive

campaign. Their participation in assembling the data was crucial. Their own "missed opportunity" survey revealed that a number of cases of adult tetanus had occurred in clients who had attended hospital outpatient clinics many times and not been immunized. Mothers who had produced tetanus babies were shown to have attended clinics other than the antenatal clinic and escaped immunization.

The ASH staff, through a review of hospital records, was able to show that when mothers began their series of immunizations during antenatal clinic, they often came too late in their pregnancies to complete the required protective series.

Finally, the hospital's board of directors were presented with a breakdown of the ASH accounts that showed that NNT treatment costs were over US\$6,000-US\$10,000 annually. The community health team made the point that for a fraction of that amount, all women in the catchment area could be immunized (Berggren, 1974). The Board realized that Hospital statistics showed rising admission for NNT despite the many steps that had been taken internally. The hospital's dilemma was "more and more cases to treat."

### C. Community Health Program Activities

The staff concluded that the answer to tetanus elimination lay both within and beyond the hospital walls. While the hospital continued to immunize any woman coming to the hospital for any reason, the community health team planned additional interventions to reduce the incidence of tetanus:

- o a marketplace immunization project;
- o the use of a community health outreach team and resident home visitors to:
  - (1) incorporate tetanus immunization into the "rally posts" which were to bring itinerant MCH services throughout the district, and
  - (2) motivate families to seek tetanus immunization, through public promotion and case investigation at the village level;
- o renewed efforts to identify, recruit, train, and supervise traditional birth attendants in safe/clean birth techniques; and
- o continuation of efforts to immunize grade school children.

In formulating and implementing these interventions, techniques later associated with social marketing were employed.

- ◆ **The Marketplace Immunization Project.** This project is an excellent example of how a community health staff can work with existing cultural practices.

**On the basis of preliminary study and observation, it planned the product or behavior to be as attractive or easy to carry out as possible:** Since most Haitian rural women attend at least one outdoor public marketplace at dawn or soon thereafter, the marketplace immunization project planned to send out its teams before daybreak. The team, using jet injectors and arriving at 06:00 a.m. at a market, could give several thousand injections a day. The team also capitalized on the fact that mothers in the Artibonite Valley tended to value injections of any sort, and trusted any team which came from "Mme Mellon's Hospital" (their name for ASH).

**The project utilized a communication strategy that effectively motivated women to act:** Messages emphasized the importance of completing the series of three immunizations. At the beginning of the project, staff took photos of the women who presented for immunization at the marketplace, later giving them away as a "prize" for having completed all three injections (the recommended series at the time). Women welcomed having a free snapshot taken with their first injection and understood they would receive it only after they had completed a series of three injections. More than 80 percent returned for second and third injections. However, when the photograph incentive was dropped, rates of return for second and third doses remained at 80 percent or higher. This may have been due in part to the education techniques described below.

**The project used appropriate, culturally sensitive messages:** Developing health education messages for the marketplace involved the use of local informants who revealed their own ability to develop culturally sensitive methods. For example, the use of "three rocks on which to set the cooking pot" as an analogy for the three doses required to confer immunity proved popular and successful. People understood, first, that the injections were being given to prevent "maladies machoir serre" (tetanus), a feared disease in Haiti. Secondly, people comprehended that, just as the health educator/ demonstrator could not expect to balance a cooking pot on only one or two rocks, but needed three, so the tetanus immunization series could not depend on one or two injections, but needed three.

**The project utilized the most effective media to maintain interest.** Local owners of trucks that served as buses to bring women to the market places spontaneously became recruiters in their own financial interest. More importantly, Haiti's "telejewel" (word of mouth, person to person) spread the news about the marketplace immunization program. News spontaneously spread about the project. Within a few months of the launching of the marketplace project there was an "everybody's doing it" atmosphere.

**The project mobilized community resources:** The team utilized volunteers, already proven to be a viable resource in the malaria eradication project in rural Haiti. Local residents did much to assist with marketplace immunizations: clergy, school teachers, local mayors and others, once contacted by the community health team, freely offered personnel and support for the marketplace campaign. They made promotional materials, recruited volunteer clerks to help with enrollment and documentation, and assisted with the project on immunization day.

Because of the many volunteer clerical activities, all clients were given their own personal immunization number and home-based record cards. Furthermore, at the insistence of ASH, clients who had outpatient clinic records were guaranteed that their latest "dose" would be posted to their outpatient record. This enabled the ASH staff to double check on immunization status in their efforts to reduce "missed opportunities" in the hospital setting.

◆ ***Use of the Community Outreach Team.***

**The project used family enrollment and the "personal prompt" for community health rally posts:** Concomitant with the marketplace campaign, the ASH community health team enrolled 23 villages (total population 10,000) as a

demonstration unit to initiate a longitudinal study of the impact of health activities. The immunization status of all family members was included in the baseline registration. Thereafter, all births, deaths, migrations, and key causes of morbidity were documented.

Volunteer resident home visitors (RHVs) reported monthly on vital events. Each was responsible for about 100 families in helping to organize neighborhood "rally posts" at monthly intervals. Immunizations were offered along with other MCH services, including a home-based immunization card if the mother had not already received one at a marketplace. The use of volunteer RHVs to invite every woman not yet immunized to rally posts and the continued use of incentives for RHVs proved crucial as the "final blow" against tetanus. The RHVs were motivated first of all through education about the long-term meaning of their tasks (most had lost a child to NNT), and through the offering of prizes (such as an inexpensive battery-run radio).

Enumeration and monitoring, via preliminary door-to-door enrollment and an RHV "personal prompt" to attend rally posts, was continued as MCH outreach activities spread throughout the hospital's catchment area, reaching over 60,000 people by 1974.

The community health outreach team, having vaccinated most women through the marketplace immunization program, had only to "mop up" the remaining unimmunized persons. In Haiti, experience proved that only partial coverage could be expected even when the team went out to rally posts, unless someone had a checklist (in this case from the family enrollment) and could do a home visit to encourage absentees to attend the activities.

**The community health outreach team motivated women through case investigations:** Case investigation became an educational tool. Whenever a case of NNT was admitted from the hospital's catchment area, an effort was made to review the mother's immunization card and/or her hospital record. If a mother had not been immunized, or, as sometimes happened, a neighbor's immunization record was substituted by an embarrassed family, a specially trained RHV was sent out to do a home visit for the purpose of investigating the case. His main question to the family was, "What could the ASH team have done to see that this mother was immunized and thus avoid the tragedy of a tetanus baby?"

The case investigator often had to travel by mule or on foot, as the few cases left were coming from more remote and inaccessible areas. He was therefore instructed to "spread the word" all along his route about the purpose of this home visit. In order to find a convenient opening, he frequently stopped to ask directions to the appropriate village and household. In good Haitian tradition, people were helpful but also demanded to know the story behind the visit. Thus, much discussion was created all along the way of the investigator. People awaited his return to question him. In this manner, many people came to understand the absolute necessity of seeing that their wives and mothers were immunized. Often, the case proved to be the child of new immigrants to the valley. The mobility of rural Haitians is a well known phenomenon and could be expected to play a role in frustrating complete coverage.

- ◆ **Training of TBAs.** Matrones promoted immunization. Illiterate TBAs were taught to check the mother's home-based immunization card and to count three injection dates whenever they entered a home to attend a delivery.

If a mother in labor was inadequately immunized, the TBA warned that the child should be immediately transported to the hospital for tetanus antitoxin. Although she took precautions in cutting the cord, she was aware that poultices of charcoal and the like might well be applied to the umbilical cord stump by family members after her departure. TBAs became important educators about the role of immunization and antitoxin.

- ◆ **Immunization of School Girls.** Although only 40% of girls aged 5-15 were in school, their immunization by a part of the ASH outreach team no doubt contributed to the long-term efforts at tetanus elimination. Schools were regularly visited by a team that administered required immunization.

#### IV. RESULTS

Tetanus admissions to the Albert Schweitzer Hospital from the hospital's district declined from 653 in 1967 to 128 in 1972 (Berggren 1974). During that five-year period, the community health outreach team spent \$67,000 on tetanus immunization activities. It would have cost the ASH over \$600,000 to treat the cases averted during this period and the five years thereafter.

Admissions for tetanus of the newborn from inside the hospital's district (a censused population of 178,000 by 1986) remained in the range of two to four per year until 1988 and 1989, when no cases were found within the hospital's district (Annual Reports, Albert Schweitzer Hospital, 1988 and 1989). This was confirmed in three ways:

- o the hospital's excellent record system where cases are reported by address and all in-district cases are investigated;
- o a review of the records of outlying rural dispensaries which refer all cases; and
- o a review of all deaths reported by community health workers.

At the same time, tetanus continued to affect up to 5% of newborns in other areas of rural Haiti (Antoine Augustine, personal communication).

The virtual elimination of NNT from the district of the Albert Schweitzer Hospital is attributed to the ongoing demand creation and/or an emerging belief system about immunizations, complemented by continued efforts to make tetanus immunization easily accessible through an emphasis on both **supply** and **demand** factors. By 1985, the hospital's outreach teams included seven outlying rural dispensaries and community health workers (RHVs) with immunization capability. Traditional birth attendants continued to have their birth kits resupplied and to be trained in safe and hygienic delivery techniques and the importance of referring women for immunization.

Indirect evidence that there may be a change in the belief system is emerging. Local informants who have conducted informal studies are convinced that families in the Artibonite Valley now seem to believe that women should get immunized before bearing children. This was corroborated informally in 1989 through random home visits carried out by a team of physicians and other health professionals from the Harvard School of Public Health. All mothers interviewed had been immunized, could produce their home-based immunization card to prove it, and explained the reason for immunization. Furthermore, interviews with trained TBAs revealed that they are strong proponents of immunization.

An impact such as the virtual elimination of tetanus implies that leaders have approved and actively supported the new community norm. It usually means that families are encouraged by their communities and institutions to effect behavioral change. And in the case of women getting themselves immunized against tetanus, women must have become confident enough to act on their own, probably with the support of families and other women.

## V. CONCLUSIONS

### A. Factors in Success

The immediate factors that contributed to the extremely successful effort to control neonatal tetanus have been described above: the ASH program provided an effective and convenient service for which the public felt a strong need, powerfully and sensitively promoted the service, and utilized community resources both for service promotion and provision. Behind these techniques lie a number of other important factors.

The fund of goodwill and trust which the Albert Schweitzer Hospital had built through years of service greatly facilitated the community health outreach team's ability to cover the population of women in the hospital's district of 150,000 persons. The hospital leadership understood basic public health principles extremely well and took an incremental, problem-solving approach to addressing the problem of neonatal tetanus. The long-term approach was extremely successful in mobilizing community resources and cooperation and in gradually incorporating complementary strategies. The hospital staff and community members were highly motivated to act, in large part due to the ubiquity of neonatal tetanus deaths. The folk health system was not only not antagonistic but was in fact extremely supportive.

### B. Replicability

One might well be skeptical of the existence of these underlying factors in other locations and circumstances, particularly in government health systems. Yet in at least one other area of Haiti, a similar model employed by government health services was also very successful. The Project Integre de Sante et de Population (PISP) in the Petit Goave area of Haiti (the northern coast of the southern peninsula) was undertaken in 1974-78, under the Haitian government's Family Health Division. A retrospective study, using World Fertility Survey techniques being developed in the area, showed that neonatal tetanus caused as many as one third of the infant deaths before the PISP project (Berggren and Paisible, 1981).

Many of the same techniques used in the ASH outreach program were replicated in the PISP project, using government employees and the existing infrastructure. The use of neighborhood "rally posts" for purposes of immunization and health and nutrition surveillance of mothers and children, added as a last step in the ASH program, brought early and extensive immunization coverage to the Petit Goave area PISP program. Deaths reported by cause and age at death revealed the disappearance of NNT by the third year of the project (Berggren and Paisible, 1981).

### C. Traditional Practices

Although this paper focuses on Haiti, the relevant experience of the Mayan Indians on Mexico's Yucatan Peninsula provides a valuable contrast. Here observers noted indigenous practices that seemed designed to prevent tetanus. One such observer, a missionary nurse-midwife, noted that tetanus was a rare occurrence among Mayan Indians on the Yucatan peninsula (Legters, personal communication, 1969). In the 1940's, before beginning to train TBAs, she recorded how Mayan traditional midwives prepared a special "birth hammock", along with umbilical cord ties and dressings. Tradition mandated that the hammock be of all new material, boiled, dried above the earth in the hot sun, and kept in a clean place until the moment labor commenced. Mayan women who gave birth in the "birth hammock" suffered little puerperal infection, and apparently most had never seen a case of tetanus.

After documenting her observations of the practices of Mayan TBAs, Legters sought the advice of Dr. DeLee, Chief of Obstetrics at the University of Chicago. She followed his sage advice to encourage the preparation of the hammock and traditional cord cut materials, maintaining a new respect for traditional wisdom.

However, where traditional wisdom is propitious in one culture, it may be harmful in another. In Africa, the possibly wise use of a burning hot coal to sear the umbilical cord stump degenerated, it would seem, to dictate instead the use of ashes or charcoal to "guard the doorway to the body." Such practices continue among some African groups and their descendants, as in rural Haiti.

#### **D. The Importance of Cultural Sensitivity and Leadership**

The ASH program staff (75% Haitian) had a deep understanding of the Haitian rural family and freely used informants from among them. Under the direction of the late William Larimer Mellon, Jr., the ASH had used "social mobilization" techniques from the time of the hospital's founding in 1956. These included community development work with community councils and income generating and agricultural projects. The identification, recruitment, and training of TBAs started in Haiti by UNICEF, was carried on by the hospital under the direction of a Haitian obstetrician, Dr. Lucien Rousseau, who modified the training and the equipment to make it more culturally appropriate.

Many of the ASH workers were village women who assisted in identification, recruitment, and informal supervision of TBAs. Training, appropriate utilization, and supervision of TBAs were worked out by sympathetic Haitian professionals familiar with a village setting in which adopting a vaccination plan or using a trained TBA required courage in the face of an apathetic family or an unsupportive community. In this case, the community leaders were crucial to the program, when, for example, they helped to announce and create the assembly points for vaccination.

#### **E. Excellent Use of Information**

The ASH program utilized information to garner support for the program, to plan the program, to motivate health staff, to guide program adjustments, and to monitor program progress.

It was very important for ASH staff to document the extent of the NNT problem and to demonstrate the cost savings from an effective preventive program. In a more typical developing-country situation, where only 5% of NNT cases are hospitalized, demonstrating the extent of the problem is a challenge that must somehow be met (Steinglass, Brenzel, and Percy, 1991). Data from existing sentinel sites, surveys, and verbal autopsies may be used.

Some activities carried out at ASH would qualify as "rapid assessment procedures" (Scrimshaw and Hurtado, 1987). This information-gathering delved into communication dynamics at the village level and was carried out so that findings could be immediately utilized by decision makers on the ASH staff. Techniques included: ethnographic studies (anthropological, knowledge-attitudes-practices surveys, intercept studies, and focus group discussions).

Formative research that directly contributed to the project's success included asking questions such as when and where women would be willing to be immunized, at what times of day, and whether they would treasure a personal record (immunization card). Messages and media were worked out within Haitian cultural traditions (three doses are like balancing the cooking

pot on three rocks, a concept demonstrated with real objects as opposed to a film or a picture).

The ASH experience demonstrated the practicality of a personal home-based immunization record for women. This tool was essential for taking advantage of all opportunities to immunize. Today, with the recommended five-dose schedule for lifelong protection, such a record is even more important.

In summary, ASH's ability to eliminate NNT was due in part to unique factors in the environment and in ASH's own resources. Yet, with sufficient will and dedication, other programs, including government ones, can use many of the same techniques to establish locally appropriate strategies for NNT elimination.

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