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**CULTURAL PERCEPTIONS
OF NEONATAL TETANUS
AND PROGRAMMING IMPLICATIONS,
BOLIVIA**

USAID/La Paz

AUGUST 1988

**Resources for
Child Health
Project**

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ACRONYMS and GLOSSARY

Ajayu	vital animating fluid, as perceived by Aymara
animo	vital fluid
ARI	acute respiratory infection
CHW	community health worker
CPCS	Coordination Program in Child Survival
curandero	traditional curer
EPI	Expanded Program on Immunization
jinchukaño	Aymara syndrome including tetanus
JSI	John Snow, Incorporated
layqas	sorcerer
layqasqa	bewitchment in Quechua
MPSSP	Ministerio de Previsión Social y Salud Pública
NT	neonatal tetanus
onqoy	sickness in Quechua
ORT	oral rehydration therapy
PAHO	Pan American Health Organization
PAI	Programa Ampliado de Inmunizacion
pasmo de ombligo	name for tetanus in Santa Cruz
PCI	Project Concern International
REACH	Resources for Child Health
susto	a malady caused by fright
TBA	traditional birth attendant
tisi onqoy	rigidity sickness, term used by some Quechua for tetanus
turqa	common Andean ritual in which an animal is sacrificed to the earth in exchange for sick person's illness or death
TT	tetanus toxoid

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UNICEF	United Nations Children's Fund
US	Unidad Sanitaria
USAID	United States Agency for International Development
wayra	wind, given as cause of paralysis or tetanus
WHO	World Health Organization

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I. EXECUTIVE SUMMARY

1. Introduction

Tetanus vaccination programs are more effective, sustainable and culturally acceptable in Bolivia, as well as other parts of the world, if health personnel understand how peasants perceive tetanus and vaccinations. Still more essential, health educators of Bolivia need to explain tetanus and its preventive vaccinations in concepts that Aymara, Quechua, and Tupi-Guarani peoples can understand. (Tupi-Guarani is used to designate the cultural area of the Department of Santa Cruz).

After reviewing literature on neonatal tetanus (NT), the author did not find any studies which explained how peasants perceive NT and tetanus toxoid (TT) either for Bolivia or other parts of the world. This research void hinders vaccination programs and cross-cultural communication on the need for women from 15 to 44 years old to be vaccinated. As a step towards improved understanding, the author served as leader of a small team to investigate how the Aymara, Quechua, and Tupi-Guarani perceive NT and TT vaccinations.

This report contains practical information on how to strengthen TT delivery to peasants of Aymara, Quechua, and Tupi-Guarani cultures. It includes detailed information on how these peasants perceive tetanus and TT vaccination and suggests ways that native concepts can be used to educate and motivate them to participate in these programs.

2. Key Findings

Department of Santa Cruz (formerly Tupi-Guarani culture)

1. NT is relatively unknown in District III of the Department of Santa Cruz where only two cases were discussed with medical staff.
2. NT is commonly reported in Districts I and II of the Department of Santa Cruz with an annual reported NT mortality rate of 13.2/1000 in District I.
3. Peasants in District II refer to tetanus as pasmo de ombligo, which is a syndrome and not a well-defined single disease.
4. Pasmo de ombligo is believed to be caused by wind or some emanation from the earth. This is a miasma theory of etiology.
5. Traditional birth attendants (TBAs) cut the umbilical cord with unsterile instruments and place unsterile powder and herbs on it.
6. Women report that they oppose vaccinations because they fear reactions, lack confidence in health personnel, and think they will be sterilized.
7. A Catholic group is reported to have circulated a pamphlet saying that TT vaccinations sterilize women and violate papal teaching.

8. The MPSSP has begun vaccination campaigns for NT. Health personnel support these efforts but lack cross-cultural communication skills.

Department of Cochabamba (predominantly Quechua culture)

1. NT is prevalent in the Department of Cochabamba with the most cases from our studies and MPSSP reports in the Chapari region. Many cases of NT are not reported because health personnel do not recognize symptoms of this disease and peasants prefer treatment by ritualists. A priest in Capinota reported ten cases of NT brought to him for baptism within a two year period.
2. Quechua peasants do not have a distinct name for tetanus but sometimes refer to it as rigidity sickness (tisi onqoy).
3. Peasants perceive the causes of tetanus to be wind (wayra), fright (susto), and bewitchment (layqasqa).
4. Where tetanus is attributed to bewitchment, peasants do not consider it a disease, but rather a symbol with sacred, social, and cosmological meanings. The mother is blamed for the bewitchment. Likewise, it can be pointed out that NT is also caused by the mother's negligence in not being vaccinated.
5. TBAs cut the umbilical cord with unsterile pieces of broken ceramic. In some communities, TBAs place dirt from the door corners on the umbilical cord.
6. Peasants report that they oppose vaccinations because of reactions, lack of confidence in health personnel, and fear of being sterilized. Peasants complained about allegedly improper methods of inoculation.
7. Health personnel provide little or no explanation about tetanus and how it is prevented by vaccinations. Some auxiliary nurses did not know what tetanus was. Doctors said they had received less than one hour instruction on tetanus in medical school.
8. Quechua women learn readily in groups. Mothers' Clubs have been successfully used to educate women about TT vaccinations.
9. Community health workers (CHWs) in Cocapata play an important role in educating peasants about TT vaccinations. They also see that women follow the immunization schedule.
10. Quechua women more readily understand lessons about tetanus and TT vaccinations through legends with animals.

Department of Oruro (predominantly Aymara culture)

1. NT is less common in the Altiplano than in the valleys and lowlands of Cochabamba and Santa Cruz.

2. NT is infrequently reported to the MPSSP partly because Aymara peasants do not specify diseases but rather symptom complexes or syndromes, such as jinchukañu, which could signify acute respiratory infection (ARI), diarrhea, septicemia, meningitis, and NT.
 3. Jinchukañu symbolizes cosmological, mythological, and social realities for peasants. The mother is blamed for attacks by jinchukañu, and this can be used analogously to teach that mothers' negligence in regard to TT vaccinations can result in one form of jinchukañu.
 4. The reasons why peasants supported vaccination programs were: a) agreement between vaccinators and community leaders on times of vaccinations; b) knowledge that vaccinations had prevented diseases in the past and in neighboring communities; c) confidence in auxiliary nurses, and; d) community education by CHWs.
 5. One successful cultural mechanism for promoting vaccinations is the use of annually required work obligations. Members of a community near Totorá, for example, fulfilled their work obligations to the province by having all the children and women come in for vaccinations.
 6. TBAs and relatives, frequently husbands, deliver babies. It would be difficult to provide training in safe birth and delivery practices because there is not a select number of specialized TBAs. Babies are delivered in unsanitary conditions and with unsterile instruments. One likely source of NT is the placing of the newborn on an unwashed sheepskin.
3. Recommendations
1. The MPSSP should continue its recent efforts to accelerate vaccination of all women from 15 to 44 years of age with TT. This effort could include women of the Altiplano, but should initially target ecological areas of known high incidence.
 2. The MPSSP is encouraged to tailor health education messages concerning NT and TT vaccinations to people in each of the Aymara, Quechua, and Tupi-Guarani cultures.
 3. Health educators need to focus on the specific symptoms of tetanus identified by each culture as being prevented by TT vaccinations. This is to avoid misperceptions by the peasants that all the symptoms of the culturally-defined syndromes will be prevented by TT vaccinations.
 4. The MPSSP needs to provide more training and supervision in proper and sterile vaccination techniques.
 5. The MPSSP should consider introducing training in cross-cultural communication skills and information about tetanus and its prevention into the curricula of medical schools.
 6. The MPSSP should consider recruiting and assigning personnel in health posts who speak the native languages and understand the local culture.

7. The Episcopal Conference of Bishops of the Catholic Church should be requested to issue a statement endorsing TT immunization of women. The statement could be distributed to and read in all parishes in Bolivia and published in Presencia. Statements by Pope John Paul II in favor of immunization during his recent visit to Bolivia might be included.
8. Auxiliary nurses should train TBAs in hygienic methods.
9. Health personnel should coordinate efforts with TBAs and curanderos in promoting TT vaccinations.
10. Because birth practices are such an integral part of Aymara, Quechua, and Tupi-Guarani cultures, it is difficult to change them. It is easier to introduce an innovation such as TT vaccinations to prevent NT. The MPSSP needs to concentrate its efforts on TT vaccinations to reduce NT in the short run.

II. PURPOSE OF VISIT: Scope of Work and Objectives

The objectives of this research were to elucidate the socio-cultural perceptions of NT and immunization acceptability among Aymara, Quechua and Spanish-speaking (Tupi-Guarani) communities of Bolivia, to identify any cultural obstacles to TT immunization, and to develop social communication strategies for NT control. The objectives were:

1. To establish the taxonomy, symptom complex, treatment, and seriousness of NT as perceived by ethnic groups and traditional practitioners, which have relevance to programming and health education messages.
2. To solicit beliefs and attitudes toward NT and TT among CHWs, curanderos, herbalists, and modern health practitioners of each area.
3. To identify misperceptions, attitudes, and fears concerning the immunization of women with TT.
4. To identify methods of actively involving the community in support of TT immunization within the indigenous cultural context.
5. To determine how traditional health concepts and practices can be used in designing health education messages.
6. To determine cultural preferences relating to immunization delivery.
7. To identify important culture-specific messages and symbols which should be used on TT protection cards.

III. BACKGROUND

Bolivia is a landlocked country in the heart of South America with an area of 424,162 square miles and, in 1987 an estimated population of 6.7 million, a population density of 15.8 per square mile and a population growth rate of 2.6% per annum (PID 1988:3). Forty three percent of the population is less than 15 years old. Forty eight percent of the population lives in localities of more than 2,000 inhabitants. The other 52% is widely dispersed and lives in rural areas where mountains, rivers, and lack of roads make travel difficult.

Bolivia is multicultural and multilingual, with two large linguistic/ethnic groups, the Aymara and Quechua, representing 62% of the population. The Aymara and Quechua groups receive few of the economic and social benefits of development. They are difficult to reach for cultural, geographic, institutional, and infrastructural reasons. The term Tupi-Guarani is broadly used to designate descendants of this culture who live in the Department of Santa Cruz. The majority of people in the Tupi-Guarani culture area have abandoned indigenous traditions, speak Spanish, and have absorbed Amazonian, European, and Andean traits into a syncretic culture. Within this report, the author refers to the Spanish-speaking people of the Department of Santa Cruz as belonging to the Tupi-Guarani culture. However, many Aymara and Quechua peasants have immigrated to this department.

Bolivia's major industry has been mining of tin, which has been unprofitable in recent years because of the low market price for this ore. Peasants practice subsistence farming which in the 1980s has been unproductive due to three years of drought and another two of flooding. However, 1987 and 1988 have been good years for farmers. Another problem has been the extreme devaluation of the Bolivian peso. Impoverishment has caused peasants to migrate to marginal areas of La Paz, Cochabamba, and Santa Cruz, as well as to coca and cocaine production areas, such as the Chapari, Chulumani, and Apolo regions of the Yungas, where they harvest coca leaves.

Regarding child survival, the maternal mortality rate is estimated at 48 per 10,000 live births, the highest in Latin America (PID 1988:3). Infection, hemorrhage and induced abortion are the principal causes of maternal mortality. Malnutrition and anemia are important associated causes of mortality. The total fertility rate is high with a national average of 6.1 children per woman (PID 1988:4). Peasant women are at a disadvantage due to low literacy rates, limited access to money, and male domination. Child mortality rates range from 97 to 134 in urban areas and 120 to 210 in rural areas (PID 1988:4). The rate for the non-salaried agricultural families is 245 per 1000 in certain areas (PID 1988:4). The principle reported causes of infant and child mortality are: 1) acute diarrheal infections; 2) acute respiratory infections; 3) perinatal infections; and 4) infections preventable by immunization (PID 1988:4). ARIs affect most heavily children under one year old, among whom the risk of death from all causes is seven times as high as that among children 1-4 years old (PID 1988:4).

Measles, whooping cough, poliomyelitis, tetanus, diphtheria, and tuberculosis are the principal vaccine-preventable infant and child diseases (PID 1988:4). According to the Civil Registry, deaths from vaccine-preventable diseases accounted for 11.4% of infant and child mortality in 1981. Data from civil registries reported by Toro (MSWPH-PAHO 1984) in urban areas for a 12 month period in 1982-1983 indicate that 11% of all perinatal mortality is attributable to tetanus. This would translate into an urban NT mortality rate of 5-7 per 1000 live births (R. Steinglass, personal communication).

The MPSSP has initiated vaccination campaigns which are said to have greatly improved coverage. USAID has allocated \$3,324,000 toward immunizations for the Community and Child Health Project (511-0594)(CCHP) in Bolivia, which is a five-year project beginning in October, 1988.

The research in this report is an endeavor to guide people in the MPSSP/CCHP and private organizations on how to educate about and implement a schedule of multiple TT vaccinations for all women of child-bearing age (15-44 years). Major problems are that peasants do not know what tetanus is, mistrust vaccinations and health personnel, and are unconvinced that immunizations prevent diseases. Although vaccination of children has had relative success in Bolivia, it may be more difficult to convince mothers to return for multiple inoculations against a disease which they often do not recognize.

The military model of immunization where peasants are ordered to line up to receive the "silver bullet" has been severely criticized (Nichter). This may have worked in the past when peasants were more dominated by the "colonial heritage", but young Bolivian peasants are suspicious of modern technology and innovations that intrude upon their culture. At its best, modern medicine is universally and cross-culturally adaptable especially when it integrates with traditional cultures and leads to improved health.

IV. TRIP ACTIVITIES

Villages visited were representative samples of the Aymara, Quechua, and Tupi-Guarani region. They were located at ecological zones from sea level to 14,000 feet. As noted in other areas of the world, altitude also appears to be an important variable in the incidence of NT in Bolivia (Ibañez 1928; Montaña 1988:2). Members of the team spent a week in each cultural area.

For the Aymara, Bastien and Velasco visited the communities of Oruro, La Joya, Choquecota, Zora Zora, and Totora. These communities were purposely selected because they represented traditional Aymara villages at altitudes of approximately 13,000 feet. For the Quechua, Palazuelos interviewed health officials in Cochabamba (8,297 ft.). Bastien and Velasco visited people in the valleys of Cocapata (7,700 ft.) and Capinota (8,411 ft.) in the Department of Cochabamba. They visited the communities of Cocapata, Cooperativa, Capinota, Sarcobamba, and Buen Retiro. Cocapata was selected because this was a Quechua community in a remote area of the

Department and close to the warm and humid Yungas. Another reason for its selection was that Cocapata had an innovative CHW program with CHWs who the team was able to interview. Capinota was selected because it was an area with many cattle and a typical Quechua community in the Department of Cochabamba.

For the Tupi-Guarani, Palazuelos interviewed health officials in Santa Cruz and Montero (both in the plains at about 1,500 feet above sea level). He also spent seven days interviewing curanderos and families of NT victims, which he had located through records of the Children's Hospital in Montero. These cities were chosen because they represent population centers of this culture. Bastien and Velasco visited communities in the Province of Vallegrande. They visited the communities of Comarapa, Vallegrande, and Trigal. The altitude of these communities is from about 5,000 to 8,000 feet. These communities were chosen because they are home to traditional peasants of Tupi-Guarani origin who have long been under the influence of Spanish tradition.

Because the objective of this research is practical advice to health personnel in Bolivia, Bastien, Palazuelos, Steinglass, and Velasco spent three days debriefing health officials in the MPSSP, PAHO, UNICEF, PCI, USAID, and the Coordination Program in Child Survival (See appendix for names of officials debriefed). This report will be translated into Spanish for USAID/La Paz to share with appropriate health officials.

V. METHODOLOGY AND APPROACHES

Prior to performing the fieldwork, Palazuelos established linkages with MPSSP planners and UNICEF and MPSSP social communicators to get their suggestions. The author began in July, 1988, with a study of literature on NT. After a computer search of existing articles in the USA, no article could be found on cultural perceptions of NT and programming implications. The author then designed a questionnaire. The team interviewed doctors, auxiliary nurses, TBAs, curanderos, and mothers from Mothers' clubs (both singly and in groups) in all communities (See appendix for questionnaire and people interviewed). This methodology was selected for uniformity because three people were interviewing different types of people in different places. Nonetheless the questions were used as starting points for discussion on relevant matters. Interviews were often open-ended and questions had to be indirect because many peasants had no idea about tetanus and TT for women. They perceived NT within broad syndromes and cultural symbols.

Many insights came from analyzing how curanderos cured infants with symptoms of NT. Their activity symbolized how they perceived NT and its causes, and how they thought it could be cured. The team had too little time to do participant observation, which involves living with the people for a long period of time, but Dr. Velasco and the author were able to capture many embedded meanings and underlying cognitive patterns because of previous long-term participant observation among the Aymara and Quechua. They each speak Aymara and Quechua and have spent nearly ten years apiece living among them.

VI. RESULTS AND CONCLUSIONS

1. Tupi-Guarani: Department of Santa Cruz

A. Incidence of Tetanus

The Department of Santa Cruz has a population of 712,407 people in an area of 370,621 square kilometers with a density of 1.92 per square kilometer (Muñoz 1977:2). Two cases of NT were discussed with an auxiliary nurse in Vallegrande (about 6,000 ft.) where people are not familiar with this disease. Neonatal tetanus is commonly found in Districts I and II (from sea level to 2,000 ft.) of the Department of Santa Cruz. District I reported 34 cases from January to June, 1988, out of a population of 119,960 people, which gives an annual reported NT mortality rate of 13.2/1000 live births. District II reported 67 cases in 1985, 81 in 1986, and 65 in 1987 with the large communities of Montero recording 91, Mineros 24, and Sagrado Corazon 29 cases over this three year period (Ayala and Gloria Torrico 1988). In Jorochito, a community outside of Santa Cruz, the incidence of NT nearly doubled from seven in 1983 to 13 in 1987 (see Appendix 3).

Dolly Montaña (1985), Alfonso Ayala (1988) and Gloria Torrico (1987) studied NT in the Hospital de Niños, Montero. Montero is 60 kilometers from Santa Cruz with an altitude of 1,157 feet and has 70,000 inhabitants with a population density of 19 people per square kilometer. Their conclusions were that NT constitutes 10-15% of hospitalized patients. The infants weighed more than three kilos and were admitted from five to ten days of age. Out of a total of 208 cases (1980-86), 130 (62.5%) were boys and 78 (37.7%) were girls. Most had been delivered by the woman's mother, relatives, or TBAs and were from rural areas. Prior to being hospitalized, the majority of infants had been treated by family members and curanderos (traditional curers). Health personnel had a relatively high success rate in treatment, compared to other parts of the world, with 146 (70%) infants recovering and 62 dying. This very low case fatality rate raises some doubt as to the reliability of the diagnoses.

B. Local names

The peasants of Province Vallegrande have little awareness of tetanus and no name was found for it. The peasants of Montero in District II often refer to tetanus as pasmo de ombligo, which literally means rigidity from the umbilical cord. Tetanus is also called pasmo in Mexico. A mestizo word, pasmo was used in Santa Cruz thirty years ago and more recently introduced to rural areas by curanderos from this city. Peasants interpret it as meaning "muerte subita de origen desconocida" ("sudden death from unknown causes"). The association of pasmo with the umbilical cord is a useful reference for tetanus and indicates an understanding of some relationship between the umbilical cord and this disease. Because peasants do not understand the word tetano, health personnel can use pasmo de ombligo but they should be aware that this is a complex of symptoms that

could also refer to acute respiratory infections (ARI), neonatal septicemia, and meningitis. Health personnel are encouraged to refer to tetanus by local names specific to the region where they work.

C. Symptoms

Peasants perceive NT symptoms as the following, "su bocacita esta dura y se pone como pico de tapir. El cuerpo esta tieso, se tira atras y tiembla. Llora todo el tiempo y tiene fiebre". ("The baby's mouth is rigid and round like the beak of a tapir. The baby's body is stiff and convulsive with an arched back [opisthotonus]. The baby continually cries and has a fever.") They recognize rigidity and often refer to tetanus with this symptom, calling it entieso or envarado. Indigenous Guarani and Chiriguano do not have names for tetanus and also refer to it by symptoms, such as ombligo negro (black umbilical cord) and cuerpo endurecido (rigid body). The symptom of black umbilical cord is not a good indicator of NT in that umbilical cords normally dry up and become dark after cutting. However, peasants often refer to black umbilical cords to signify infection. They often do not distinguish pus from blood and say that it is bleeding.

A practical consideration is that some of the above symptoms, such as fever, crying, infected umbilical cord and paralysis may also be caused by ARI, septicemia and neonatal meningitis. Health personnel need to realize that pasmo de ombligo is a syndrome and not a well-defined disease category. This syndrome does not include diarrhea and vomiting.

The difference between a complex of symptoms (syndrome) and individual symptoms of a particular disease is that a syndrome often includes symptoms that could refer to several diseases. As will be shown more clearly among the Quechua and Aymara, Bolivian peasants cluster symptoms into associative and symbolic patterns which relate more to their perceived causes rather than to pathological causes. For example, Tupi-Guarani peasants would not associate the infected umbilical cord with the cause of NT, but rather, they would cluster this symptom into a pasmo syndrome which includes symptoms indicative of emanations from the environment. They would perceive pasmo de ombligo either as a drying up or a congealing of the body brought about by toxic odors or cold winds which cause an imbalance of vital fluids.

Traditional curers and ritualists identify various symptoms and classify them into syndromes based on their perceptions of how these symptoms interrelate to environmental, social, and cultural complexes. Frequently, curers disagree about which syndromes to place the varied expressions of disease into. For them, symptoms are like cards in a deck which can be sorted by different players in many combinations. Moreover, health personnel need to realize that any physical symptom means more to a peasant than a sign of disease; it also refers to disequilibrium in his environment, family, and cosmology. Some of these factors are more relevant to him than the disease.

D. Birth Practices

The fact that the majority of NT cases in Montero were babies delivered by traditional and untrained TBAs and relatives indicates lack of hygiene as a probable cause. They cut the umbilical cord with knives, scissors, broken glass or ceramic, rocks, human hair, and corn leaves. They tie it with string or hair and put dandelion and lengua de buey herbs on it. These unsterilized items frequently come into contact with tetanus bacilli. One possible explanation for why more boys than girls contract NT in Montero is that TBAs leave a longer section of the umbilical cord for the boy, which symbolizes the penis. This extended umbilical cord is more likely to become infected. Health personnel should realize that birth attendants often do not wash themselves or the baby because they fear contamination by cold air. They often wrap the baby with unwashed cloths.

It is difficult to reeducate TBAs because they follow traditional practices. Few understand germ theory, and almost all use available materials. In Vallegrande, for instance, a mother on a journey delivered her own baby cutting the umbilical cord with two stones. The infant later died of NT. At meetings of mothers' clubs, health personnel can assist expecting mothers to prepare birth delivery kits with an unwrapped razor blade, sterilized cotton and thread, and alcohol. TBAs and mothers should be discouraged from using medicinal plants to dress the umbilical cord.

E. Perceived Causes

Some folk beliefs for the causes of tetanus are that the mother sat on an ant pile, the bite of the venchuga bug (mal de chagas), the evil eye, bewitchment, violation of a taboo and that the fontanelle is open or someone has touched it. A deeper look at the word pasmo, however, reveals their etiology. Pasmos are often associated with elements of the universe, such as pasmo de la luna, pasmo del rayo, pasmo del sol, and pasmo del sur. Pasmos are believed to be caused, for example, when the mother exposes her infant to different elements of climate. Pasmo del rayo is caused by the pregnant mother being exposed to lightning, and leads to the child having epileptic seizures. Pasmo del sol is overexposure of the infant to the sun which results in fever, and pasmo de sereno is produced by humid nights and results in respiratory diseases. Tupi-Guarani classify pasmos into calientes (hot) and frios (cold), depending upon whether the infant is sweating or rigid.

From the above uses of pasmo, one can interpret pasmo de ombligo to mean that some emanation from the earth has passed from the mother through the umbilical cord to the child. For example, one cause of pasmo de ombligo is when the pregnant mother walks past putrid matter, such as a cemetery or dead dog. It is the odor that causes the disease. These peasants believe that tetanus is caused not by microbes but by smells, vapors, and wind. For example, pasmo de ombligo is often attributed to a cold blast of air or wind (wayra) chilling the baby or mother and resulting in paralysis or ataques (convulsions). Health personnel should realize then that these peasants do not consider contamination and lack of hygiene, especially in regard to birth practices (cutting and tying of the umbilical cord), as causes of tetanus.

F. Treatment by Curanderos

Native practitioners have no specific treatments for tetanus, per se, but many for pasmo de ombligo. They bathe the infant with herbs and ashes of worn clothes and soles of shoes. Another treatment is to place the baby in the intestinal cavity of a slaughtered cow, symbolizing its rebirth. They also incense the infant by burning oils from cow's hooves and resin of the cuti tree. They place plasters of puchon oil mixed with scrapings of wayacan and, in other instances, of cutuqui on the infected umbilical cord. These herbal remedies treat the symptoms: lower the fever, control secretions from the umbilical cord, increase blood pressure, and relieve congestion. This also supports the conclusion that sicknesses other than tetanus are included in pasmo de ombligo, some of which curanderos are able to cure. Health personnel could educate curanderos that infected umbilical cords possibly indicate NT which can be prevented by TT. Curanderos could be invited to participate in TT campaigns and should be given credit for preventing this disease.

G. Rituals

Once the mothers realize that natural cures are unsuccessful, they bring their infants to ritualists. Although a variety of rituals can be found throughout the Department of Santa Cruz, a fairly typical pattern is to have ritualists perform la santiguada and saraqoa for pasmo de ombligo. Santiguadores incense the child and then pray Padre Nuestro (Our Father) and Ave Maria over the child. They call this "una vencida", "conquering the other force." Meanwhile, relatives call the name of the child to recover its animo (vital fluid) or ajayu, which is a metaphor for an animating fluid dispersed from the body. Saraqoa is a ritual of Andean origin, probably introduced by Aymara and Quechua migrants. Ritualists sacrifice a sheep, eat it in a communal meal, and bury its bones at a crossroads. They pichan (sweep) the body of the infant with these bones to remove the substance causing the sickness. When pasmo de ombligo is tetanus, these rituals are unsuccessful and the baby is brought to the priest for baptism. For most peasants throughout Bolivia, baptism is more important than hospitalization in cases of gravely ill neonates because they fear that unbaptized babies become moros (infidel Moors) or demonios (devils) who will plague their communities with hail, drought, floods, and frosts. These ritual practices delay medical treatment by doctors. Health personnel should educate ritualists as to the dangers of tetanus. They should also arrange for collaborative treatment of pasmo de ombligo whereby the ritualist deals with perceived causes and the doctor with empirical ones. The Episcopal Conference of Bishops of the Catholic Church could issue a pastoral letter advising married women to receive TT and all priests to refer cases of seriously ill infants brought for baptism to doctors.

H. Perceptions of Vaccinations

Women fear reactions from TT vaccinations. Their parents recall unfavorable reactions from vaccinations against smallpox which are still remembered but are passing with time. In Vallegrande, for example, one

famous curandera attributes her son's muteness to a vaccination. A major complaint of women concerning TT is that they do not know what tetanus is and why they should receive the vaccination if they are healthy. However, they do know what pasmo de ombligo is and it is important that health personnel explain how TT prevents one form of pasmo de ombligo. Continually recurring complaints of women are that health personnel do not treat them well and that vaccinations are poorly administered, resulting in infections, sores, and bumps. Many peasants lack confidence in doctors and auxiliary nurses of the MPSSP, which is partially due to lack of cross-cultural communication skills. Health personnel should explain to women what the symptoms of NT are and how this can be avoided by receiving a series of TT immunizations. They should explain the common reactions that can normally be expected and provide remedies for them.

Another obstacle to vaccinations is the suspicion that they cause sterility in women. One origin of this is that the Catholic Church has been reported to have said that women should not get vaccinated because it causes sterility which is against Papal teachings. A Catholic group, Cristiandad, is believed to have circulated a pamphlet advocating this; however, there is no evidence to support this. Sterility was also given as a reason for opposing vaccinations in the Departments of Oruro and Cochabamba. It is recommended that officials from the MPSSP request a statement from the Episcopal Conference of the Catholic Church in Bolivia fully endorsing TT immunization of women. This statement could be distributed in a pastoral letter to all parishes of Bolivia and could be published in Presencia. Statements by Pope John Paul II in favor of immunization during his recent visit to Bolivia might be included.

I. Traditional Concepts Useful for Vaccinations

The purpose of this section is to outline indigenous cognitive patterns that can be used to support immunization. One culturally specific strategy would be to explain that tetanus is a disease often associated with pasmo de ombligo. As peasants perceive it, pasmo is caused by an odor, vapor or wind passing from the mother to the infant through the umbilical cord. In an analogous fashion, they will be receptive to the idea that TT vaccinations contain precious fluids that also pass from the mother to the child through the umbilical cord to destroy these noxious substances. Another strategy is to mention folk methods of preventing diseases, such as pichar (sweeping) the child or mother, performing santiguades, and smoking cigarettes. These methods can be used to begin a discussion on how vaccinations protect the mother and child from tetanus. Health personnel need carefully to point out that TT will not protect them and the infant from all symptoms of pasmo de ombligo, but only from those relating to tetanus. Health educators should not attempt to abolish the term pasmo de ombligo, which is deeply rooted into their cognitive patterns, but should show how scientific concepts of tetanus and TT can fit accurately into this syndrome.

J. Strategies for Immunization

Concerning strategies for immunization, a problem in the Department of Santa Cruz is access to services. Communities are spread out and difficult to reach. One solution is a mobile unit, such as that found in Vallegrande, where seven auxiliary nurses are assigned zones. Traveling by motorbikes, they visit the communities in their zones every three months to screen the people for vaccination. Another problem is that villagers are notified by radio concerning when and where they should be present to be vaccinated. The mobile units do not often consult with the villagers about the feasibility or practicality of the schedule. Months during planting and harvesting may not be good times. It would be helpful if health planners could meet with village leaders to agree upon times for vaccination campaigns.

During the campaigns, the peasants are hastily vaccinated with little personal communication and education between the vaccinator and the peasant. One complaint which we commonly heard was that health staff treat them roughly. Many peasants claim to have little confidence in the health personnel of the MPSSP, and some of this could be due to staff insensitivity toward peasants. Staff do not explain TT in ways that peasants understand. Finally, several doctors observed that vaccinators need to be better equipped and trained in administering vaccinations. This was supported by the fact that peasants complained about infections, swellings and hard spots from vaccinations, although temporary nodules at the injection site are a normal consequence of toxoid injections.

K. Social Communication Methods

In the Province of Vallegrande, coplas or rhymed verses are popular and can be used to teach effectively about tetanus and TT vaccinations. One example would be:

"Pasmo de ombligo puede ser tetano y matar a su wawa.
La manera de evitarlo es vacunar a la mama."

"Pasmo de ombligo could be tetanus and kill the baby.
The way to prevent it is to vaccinate the mother."

Coplas need to be answered, so there is audience participation. One such response might be:

"Tetano o pasmo de ombligo es muy malo.
Se vuelve el niño entiesado, ombligo infectado, y muerto."

"Tetanus or pasmo de ombligo is very bad.
The baby becomes rigid, the umbilical cord is infected, the baby dies."

Coplas can also be used for NT control in Tarija where they are popular.

Health personnel of Vallegrande use sociodramas with costumes to represent microbes of different diseases. Closely involved in health programs in the area, the Catholic clergy emphasize conscientización of the people. People should make their own decisions about TT vaccinations by examining the reality of NT. Health educators need to educate the people about this reality. NT may not be as serious a public health problem in Vallegrande as in Montero. (There is a strong possibility that infants with NT are not being reported in District III because the symptoms are not recognized as tetanus and infants in remote communities die before they are able to be brought to health posts). More serious concerns in Vallegrande are goiter and Chagas' disease. Nonetheless, women from this area frequently travel to lower areas where NT is endemic. They need to be vaccinated with TT.

In Districts I and II of Santa Cruz, mass communication methods should be used to inform peasants about tetanus and immunization. Television programs are an effective way to reach many people living in cities near Santa Cruz. The distinguished TV producer, Ruben Poma said that one has to educate peasants to break their belief that the death of infants is an acceptable daily event. He recommended that the love of the mother for her infant should be used to motivate her to be vaccinated. Poma said that the radio is an effective way to reach peasants in distant settlements. He commented that people quote advice from the radio in objections to teachings from health personnel, such as advertisements for formula-feeding instead of breast-feeding. Poma also suggested dramatization of tetanus through posters, videos, and photographs, and then helping mothers draw the conclusion that they should be vaccinated to protect their infants from NT. The point could also be made that because pasmo de ombligo is a syndrome, which might be caused by diseases other than tetanus, the child should receive many vaccinations to prevent some of these diseases. They should not be told that TT prevents pasmo de ombligo, since this complex of symptoms could also be associated with septicemia, meningitis, and ARI.

The most effective way to educate peasants is through meetings and classes. Health educators in public schools could be sent brochures on NT and vaccinations. Auxiliary nurses should educate mothers in Centros de Madres and Mothers' Clubs about childhood diseases and how some of them can be prevented by vaccinations. The MPSSP could provide brochures and lesson plans for each disease. People cannot be vaccinated in ignorance, or by lining them up in military style and giving them the "silver bullet." Many peasants complain that they do not know why they should get vaccinated if they are healthy. Some believe that vaccinations do them harm. Nichter discusses vaccinations as "silver bullets". More emphasis is given to numbers of vaccinations than education. This may work for single-dose antigens, but multiple doses are required for NT. To sustain high coverage levels, women have to be motivated to return for subsequent inoculations.

L. Culture Specific Approaches

The MPSSP might like to use these culture-specific messages and approaches for TT delivery among the Tupi-Guarani:

1. Tetanus is a deadly form of pasmo de ombligo that causes rigidity, convulsions, and death in infants. Tetanus is an invisible living organism found in the soil. This organism frequently sticks to the hands and instruments of the person performing the home delivery and enters the umbilical cord of the baby. The baby becomes very sick with a rigid mouth, arched back, convulsions, and often fever. The baby usually dies from this form of pasmo de ombligo.
2. Mothers cry when their babies die because they love them so. Their children bring them happiness but not when they die from pasmo de ombligo. One type of pasmo de ombligo, tetanus, can be prevented from killing infants. Mothers can protect their babies from tetanus by receiving the protective fluids of TT injections. These valuable fluids pass from the injection into the mother and through their umbilical cords to their babies. These fluids, called tetanus toxoid, protect the babies for awhile from the rigidity form of pasmo de ombligo. Soon after birth, babies must receive their own protective fluids by being vaccinated with DPT.

Part of the above message could be printed on TT protection cards to be given to the women. There could also be explanations about the following: why all women between the ages of 15 and 44 years are to be vaccinated; why multiple doses are necessary; what reactions can be expected--and what actions to take; and what is the schedule for the vaccinations. Instead of printing five spaces to be marked each time the woman is vaccinated, it would be better also to print the meaning of each inoculation, for example, the third dose: during the next five years, mother will protect her newborn infants from pasmo de ombligo (tetanus). Care must be taken not to confuse the duration of the mother's protection with that of the infant. A culturally appropriate symbol to mark the vaccinations would be a cross, which contains several meanings (Jesus, protection, earth and sky), and suggests a syringe. The card should be large, readable, and in the favorite color of women in the Tupi-Guarani area. The above suggestions would need to be field-tested before adoption.

2. **Quechua: Department of Cochabamba**

A. Incidence of tetanus

The Department of Cochabamba has a population of 777,807 people living in 55,631 square kilometers with a population density of 13.98 people per square kilometer (Muñoz 1977:2). In the Department of Cochabamba, 141 cases of NT were reported to the Unidad Sanitaria between 1980 and 1986. Forty six of these cases were fatal. Situated in the Yungas area (a lower humid area from 4,875 to 6,500 ft.), the Chapari region reports the most cases. The District of Aiquile (7,231 ft.) reported seven cases of tetanus in 1987. During our investigations in Cocapata (7,700 ft.), health

personnel reported no incidence of tetanus in this valley. Health personnel of Capinota (8,411 ft.) also claimed that NT did not exist there. This report from Capinota was questioned in that the health personnel were not clear as to what were the symptoms of NT. Peasants in Cocapata and Capinota raise cows and other livestock associated with tetanus bacilli. Moreover, the parish priest of Capinota said that he had baptized five babies in the last year with symptoms of NT. He reported the same number in outlying rural communities. This supported the hypothesis that many cases of NT never arrive at the Postas Sanitarias because NT is perceived as a bewitchment or castigo (punishment) that must be dealt with by ritualists. Because of the stigma and fear attached to this, peasants do not report NT. Health personnel in the Department of Cochabamba should be informed of the symptoms of tetanus and advised to collaborate with curanderos and priests in its treatment and prevention.

B. Local Names

Quechua frequently refer to tetanus with words that also refer to other diseases, such as tisi onqoy, which is a combination of tieso (rigidity) and tisis (tuberculosis) with onqoy (sickness); kharisirisqa, which refers to ARI and diarrhea, attributed to a kharisiri, a legendary figure who steals a person's fat; chujchu (malaria); wayra (Bell's palsy or paralysis) and arrebato (susto). No specific name was found for tetanus. It is recommended that the word tetano be used with a description of its symptoms in Quechua: Tetano Onqoy (Tetanus Sickness), uya kwirpuwan kashan k'aspilla (face and body are rigid), wawa mana nunuyta munanpunichu (baby does not want to suck), fiebre kashan (has a fever), gara kulli kashan (the skin is purple), mana sumaj atinchu samay (can not breathe well), wawa khatataschan (baby has convulsions), and ombligo mana walinchu (umbilical cord is not well). Health personnel need to recognize that not all the above symptoms are exclusively associated with NT and some symptoms could indicate acute respiratory infections, septicemia, meningitis, malaria, and diarrhea. Rigidity and an infected umbilical cord should be emphasized in the differential diagnosis of NT.

C. Symptoms

Often Quechua peasants do not recognize rigidity and an infected umbilical cord as key diagnostic symptoms. Mothers wrap their infants in wide woven belts which lessens the possibility of detecting rigidity. They are very concerned, however, when the infant does not breast feed and has a fever. They cover the umbilical cord with raw cotton or rags and are not always aware of its being infected. Often they do not observe the pus excreted from the umbilical cord and only report that it is bleeding. Health personnel should educate mothers in Mothers' Clubs to watch for infections of the umbilical cord and signs of rigidity in infants, which is preventable by TT vaccination of the mother.

D. Birth Practices

Birth practices in Cocapata and Capinota are typical of other Quechua areas. The TBA massages the baby down the woman's stomach while she is crouched, and another holds her from the back. The TBA receives the baby,

ties the umbilical cord, leaving a longer section for a boy, cuts it with a broken piece of new ceramic, losa, (a universal Andean practice) and covers it with crude cotton. The TBA washes the baby to remove its protective oil, which many mothers believe causes sarna (scabies). The TBA wraps the baby in three chumpi (wide woven belts) to protect it from wayra (wind or a cold blast of air) which supposedly causes paralysis.

The tetanus bacilli or spores could enter the umbilical cord from the hands of the TBA, possibly being harbored underneath the fingernails, or from contaminated cotton, cloths, or powders applied to the umbilical cord to make it dry up. One TBA said that it was common practice for TBAs to take powder from the crevices of doors and apply it to the umbilical cord. There are so many possibilities for NT contamination in home deliveries that it would be difficult to prevent this disease by teaching TBAs aseptic methods. Although this is recommended for raising public health standards, prevention of NT can be more effectively accomplished in the short term by immunization of all women of child-bearing age in Bolivia. One problem with training TBAs is their large numbers and that often the woman's mother, husband or another relative performs this role. Moreover, it is easier to introduce an innovation, such as TT vaccinations, than it is to change cultural patterns, especially those associated with birth practices.

E. Perceived Causes

Quechua attribute many causes to symptoms associated with tetanus. Wayra (wind) or aire enter the umbilical cord and cause paralysis or ataques (convulsions). Wayra is also given as the cause of epileptic seizures, heart attacks, Bell's palsy and polio. This is probably an adaptation of European humoral theory which taught that extremes of cold caused the blood and muscles to be immobile. (Bolivians fear drafts of air). This is also an adaptive strategy to their mountainous region where there is great fluctuation between night and day temperatures, and icy winds on warm sweating bodies frequently cause cramps. It is potentially harmful that they wash the newborn infant of its protective oils, which subjects the infant to infection from the cold. Arrebato (susto) is another cause of tetanus. The infant loses its animo because the pregnant mother was nervous, shouted at somebody, lost her temper or was physically abused. None of either the peasants interviewed or the two auxiliary nurses recognized the relationship between contaminated umbilical cords and NT.

For adults, health personnel attributed tetanus to rusty nails, little aware that the spore is found in dung and on the ground in many courtyards where animals are kept. The probability of people coming into contact with the tetanus spore through injuries to the feet, hands, and legs is high. Finally, they believe that the risus sardonicus, arched back and convulsions are caused by bewitchment. The dramatic nature of tetanus leads peasants to think that its causes lie in the supernatural.

F. Treatment by Curanderos

Three classes of cures are employed to treat NT, depending upon its perceived causes of susto, contamination, or bewitchment. Curanderos treat susto by bathing the infant with herbs, burning goa (Satureia boliviana), and petitioning the infant's animo to return. Some perform santiguadas, as mentioned for the Tupi-Guarani. They also perform dispelling rituals, pichar (to sweep), to remove "noxious" substances from the infant. This consists of substitution magic: a bundle with undesirable symbols is used to rub the infant's head, arms, torso, legs and feet to remove the chije (misfortune). This bundle is left at crossroads for someone else to pick up and harbor the misfortune. This symbolism can be used to explain how vaccinations work: vaccinations of TT remove the substances from the woman that cause NT in similar fashion as the curandero attempts to sweep them from the infant's body, only with the difference that vaccinations protect the infant from getting sick from tetanus.

G. Ritual

Quechua peasants commonly attribute tetanus to bewitchment and do not consider it a sickness. This is one reason why they do not bring infants with NT to the health post. One expert curandero from Areque described how he tried to cure an infant with NT. This account provides insights into how Quechua perceive this disease. Someone envious or hateful of the pregnant mother contracted a layqa (witch) to punish the mother by placing a hex on her infant. Infants are more vulnerable than adults who have more ways of resisting "attacks". The layqa made a doll from a stock of black corn, wrapping it with chumpis and forming a head. He put cactus spines on one side of the back explaining why the baby's body was arched. He made a frog urinate on the doll and buried it near the pregnant lady's house. After the baby was born, it appeared to be asustado with its eyes wide open and unable to close them. She complained that her baby looked at her like a cat without blinking. The infant opened his hands and could not close them.

The curandero was summoned to cure this ten day old infant. The mother complained that the infant removed his clothing. She would wrap him up and he would unravel the wrappings with his strength. The curandero told the mother to unwrap the infant because the spell was being done on a wrapped-up doll. The baby had trouble breathing, its mouth formed like a fish out of water. It stretched out and retracted from one moment to the next (convulsions). He rubbed the baby with cow grease and alcohol to lower the fever. Temporarily, the infant improved.

Later in the evening, they called the curandero, who told them that he was unable to cure the infant and that baby should be baptized. They burned goa and prayed because the infant was like the sajjra (devil). He washed the baby with rose water, incense, fox dung, garlic, retama, and alcohol. He feared the strength of the baby. After the bath, the infant improved for a moment, then whimpered softly in a crescendo that ended in the scream of a terrified adult. The infant raised its head and its eyes protruded as if they were about to pop out. Crying without tears and gasping for air like a fish out of water, he sat up, jerked back and died.

His body was rigid and frozen. Terrified, the curandero, mother and relatives performed a ritual to protect themselves from the powers of the bewitchment. They sprinkled blood of white and black guinea pigs and sheep around the corners of the house and plaza.

The next day a priest refused to baptize the dead infant, adding to their shame and regret. The mother, father, and curandero secretly buried the infant in a sacred Quechua burial site, located near the Taquina brewery in Cochabamba.

Several days later, the mother became paralyzed (possibly a hysterical reaction), and the curandero cured her with medicinal plants. Because she showed the same symptoms as her baby, he was certain that she was bewitched and recommended that she move from the community. She now resides in Oruro and has six children.

This case history shows that Quechua peasants perceive the symptoms of tetanus within a magical-supernatural framework which not only shocks them but also causes social problems for the family, with the mother being blamed. One problem with NT is that it is perceived more within a social and cosmological context than as a pathological entity. It would be ineffective to try to discount their perceptions, so it is recommended that health personnel be sensitive to these considerations while at the time providing alternative therapies and, above all, stressing preventive immunization. As mentioned before, one reason why NT cases are not brought to doctors is that the dramatic affect of its symptoms are frequently interpreted as symbols of witchcraft and devil possession. Moreover, the mother is implicitly and indirectly blamed for this.

H. Perceptions of Vaccinations

Some peasants said that they did not know what tetanus was and they suspected that, because only women were being vaccinated, it was to sterilize them. Others feared reactions, varying from fevers, pus and paralysis to death. Many did not think they should be vaccinated if they were healthy. Reasons for vaccinations were that they associated good experiences in their family or community with them. They realize that smallpox vaccinations saved many from this dreadful disease. In one community, for example, the people refused to be vaccinated for measles and more children died in that place than in the community where every child was vaccinated. Some realized that vaccinations made their cows healthier and wanted them for themselves and their children. Some asked why men were not being vaccinated with TT. Research indicates that there is a high correlation between positive perceptions of vaccinations and confidence in the health workers. Consequently it is imperative that health workers build up confidence with peasants as a step toward more collaboration in vaccination programs. One way to do this is to speak Quechua and be attentive to their ideas about traditional medicine.

I. Traditional Concepts Useful for Vaccinations

Peasants often do not recognize tetanus as a disease but rather as a bewitchment and sometimes as devil-possession. Claims that TT prevents its symptoms will also be understood in magical-supernatural terms unless peasants are taught the relationship of the microbe to the umbilical cord and to the symptoms of the disease. Although it is not recommended that health educators explain to peasants that the needles of vaccinations protect their babies from the hex-directed thorns of layqas, which is unscientific, educators can use this as an example to show how vaccinations work. The assumption of witchcraft is that people can cause diseases by negligence and willful acts; so too the assumption of immunization is that people can protect themselves and their babies from diseases by freely deciding to be vaccinated five times or with each pregnancy.

Another insight from the case history above is the peasant's recognition that the infant is vulnerable to the mother's negligence. Quechua recognize that layqas frequently attack mothers through their infants because adults have more defenses. Premises of these beliefs can also be adapted for vaccination instructions. These premises are that the mother's behavior affects the infant's health, that infants are very vulnerable to attack from outside forces, and that the indirect cause of a symptom in an infant can be traced to the mother (which was symbolically expressed when the curandero threw the coca leaves to ascertain what the mother had done wrong to bring about the bewitchment). Blame is implicitly imputed to the mother. In a positive fashion, mothers can be instructed that vaccinations are a good way to protect their infants, who are so vulnerable to attacks from foreign things, and themselves from the reproach of the community.

Vaccination programs should be conducted as community affairs to utilize a basic Andean concept that health and disease are interrelated to social and cosmological systems. One useful strategy would be to invite the curandero to participate in the vaccination program by first throwing coca leaves to predict its outcome and then to perform a ritual to make it "complete" or good for the community in a holistic fashion. This could change someone resistant to vaccinations into a supporter of them. Moreover, it also deals with suspicions about the cosmological and social consequences of inserting needles into children and adult women.

J. Strategies for Immunization

Suggestions presented for the Tupi-Guarani are also applicable for Quechua peasants. Quechua women are very sociable and learn rapidly through group activities. It is important that health workers educate and vaccinate them in social gatherings such as meetings of Mothers' Clubs. Educational strategies should try to convince the group of the importance of TT. Once there is group consensus, then individual members will comply with the norm. It is important to discuss openly their objections to TT vaccinations. Role playing and sociodramas bring out underlying fears in ways that they can deal with. Although the corregidor (sheriff) of each community can insist that all women be present for vaccinations, this is no

substitute for prior education. Educators must correct the misunderstandings of women about TT, dispel their fears, and motivate them to be vaccinated.

K. Social Communication Methods

An effective way to communicate about vaccinations is to divide mothers at a Mothers' Club meeting into groups of six and ask them to make up a legend using plants, animals, birds, or earth which explains the lesson about immunization. The first step is to provide them with an example, such as the following story of a sheep, fox, and dog:

Mother sheep gave birth to a lamb. She cut its umbilical cord with dirty hands using an unclean piece of ceramic. It seemed okay and took breast milk. Five days later, the lamb could not open its mouth to suckle the mother sheep's breast. It shook violently and then lay on its back with its legs rigid. The mother sheep baaa..ed and baa..ed and tried to save her lamb, but she was unable. The lamb died the next day.

Mother sheep was very sad for many days. One day she asked the cow why her lamb died. Cow said that it was because of tetanus spores found in dung and soil. Cow also said that tetanus enters the baby through the umbilical cord. It causes them to become rigid, to shake, have a high fever, lose their breath and die. The mother can prevent tetanus in her child by being vaccinated.

Vaccination is like a dog protecting lambs from being attack by foxes. Shepherds have dogs to protect their lambs, so too mothers should receive vaccinations to protect their babies from tetanus.

Illustrations with animals, birds, and plants provide lessons that are continually repeated each time these items of nature are encountered. Quechua best learn about tetanus and vaccinations by creating stories, which are often repeated, and according to their oral tradition become embellished with the telling. This method of instruction allows Quechua mothers to express lessons about NT and vaccinations in their own analogies, legends, and symbols.

L. Culture Specific Approaches

The MPSSP should consider following these culture-specific messages and approaches for TT delivery among the Quechua. Because tetanus is not specifically known, a description in Quechua of its symptoms, as found above, should be printed on the vaccination card. Explanations could be given about reactions, vaccination schedules, and reasons why women from ages 15 to 44 need to be vaccinated. The card could be in the favorite color of Quechua women. As suggested for the Tupi-Guarani, doses should be explained in meaningful terms. A culturally appropriate symbol for the card would be that of the Virgen de Urkupiña, which symbolizes fertility, motherhood, Mother Earth (Pachamama), a hill and health.

Explanations could utilize the cultural beliefs that mothers are responsible for NT and that sicknesses are signs of harmful external influences. One lesson plan might be phrased: "You believe that layqas can cause ataques by sticking pins in dolls made of corn stalks. Vaccinations protect your children from diseases. These needles contain fluids that protect you and your infant. When you receive TT vaccinations, your future babies will not die from NT, which is a disease that freezes their muscles and mouth and makes them rigid and unable to suck." The above suggestions would need field-testing before adoption.

3. Aymara: Department of Oruro

A. Incidence of Tetanus

Tetanus is found less frequently in the Department of Oruro, a part of the Altiplano (12,000 to 13,500 ft.), than in the valleys of Cochabamba and plains of Santa Cruz. The Department of Oruro has a population of 310,983 people living in 53,688 square kilometers with a population density of 5.79 people per square kilometer (Muñoz 1977:2). Health personnel of the Department of Oruro reported cases of NT in La Joya, Paria, and Totora; all of these communities are above 13,000 feet. The auxiliary nurse of La Joya diagnosed two cases of NT in 1988, but one was probably ARI. Dr. David Morales of the Clinic San Pio Decimo in Oruro treated a case of NT from Paria (12,051 ft.). A sample of pus from the umbilical cord was sent for laboratory culture and tetanus bacilli were found. Dr. Ponciano Jimenez reported a case in Turco. These reports question a recent UNICEF study that says that NT does not exist in the Altiplano. Marcos and Halkyer (1988:3) also wrote that tetanus does not exist in the Altiplano. However, the tetanus spore is found in the Altiplano (Ibañez 1928). Justo Bustillos, Secretary of Statistics at the MPSSP, reported five cases of tetanus in 1985 for La Paz.

An important factor is that Aymara women frequently travel to and deliver at lower and more humid areas where they are at greater risk of contamination from the tetanus spore. These factors warrant TT vaccination for women of the Altiplano.

B. Local names

Aymara peasants do not recognize tetanus as a disease in itself but include its symptoms within jinchukañu, a syndrome which could refer to ARI (moderate or serious), serious diarrhea, and septicemia. Aymara have other syndromes, lari lari and chullpa, which also symbolize complexes of symptoms and magical mythological beliefs. These syndromes may include NT, but in our area of research NT was subsumed into jinchukañu. Health personnel reported some misnomers for NT, such as suchu (polio), anqo usu (paralysis of adults and sometimes rheumatism), and aire (Bell's palsy).

C. Symptoms

Health workers need to describe in Aymara the symptoms of tetanus to help peasants recognize this disease: ajanu turo (rigid face), cuerpojja waththapisquiwa, janiu sarquiti (body is rigid, cannot move), laka

jistkatata (mouth is closed), janiu ñuñjatquiti (cannot breast-feed), ataque kharkhatiscaquiwa (convulsions--one must be careful to distinguish convulsions of tetanus from those of malaria, thala usu), wawajj kurur usuyasi (the baby's umbilical cord is infected), jachac jachasquiwa (continual crying), ancha atatawa cuerpopajj (fever--calienturawa, a Hispanicized-Aymara term may also be used for this), samaquesquiwa (difficulty in breathing), and cuer pɔjja moradoquiwa (the body is purple).

Peasants do not know the symptoms of NT and do not associate its symptoms with a well-defined disease entity. Certain symptoms have priority for Aymara mothers and may mask other symptoms. When an Aymara mother, for example, carries on her back a baby with convulsions, rigidity, continual crying, and inability to breast feed, what concerns her most is the continual crying and inability to breast feed in an infant who previously could suck. If observed at all, rigidity and convulsions are interpreted as being caused by crying or not feeding. It is important that doctors and auxiliary nurses unwrap the infant to check for rigidity, when they attend complaints of llanto (crying) and not nursing. They should always ask the mother's permission to do this. Although constant crying is not a specific symptom of NT, it often indicates to Aymara women that the baby is seriously ill. Moreover, Aymara women recognize certain types of cries as indicating gravity of illness.

D. Birth practices

During deliveries, possible sources of contamination are the universal use of broken ceramic to cut the umbilical cord, covering it with herbs and tying it with thread. TBAs place the newborn on a sheepskin. This is a likely source of tetanus spores, and it is recommended that mothers wash the sheepskin and place it in the sun before it is used for the baby. Men as well as women deliver babies, and frequently their hands are dirty from farm work.

E. Perceived causes

Peasants of Curahuara de Carangas Province associate NT with jinchukañu. Jinchukañu is an owl that appears at night and hoots, similar to the deep cry of an infant. If the infant cries in return, the owl enters its house as either a cat, insect, or lizard. The owl grasps the baby with its claws. The baby screams and at this instance its ajayu goes from its mouth into the claws of the owl who flies away. Ajayu is frequently translated as "soul" or "spirit" (animo), but Aymara perceive it as a vital energizing fluid which is invisible but important to maintain equilibrium between hot and cold, and wet and dry qualities within the body. Indications of jinchukañu are purple marks, supposedly from the owl's claws, found on the baby after death.

The symptoms of jinchukañu are constant crying, diarrhea, sunken eyes, dry mouth, vomiting, rigidity, fever, and convulsions. This syndrome most frequently refers to ARI and diarrhea, but could also apply to bacterial infections of meningitis, septicemia, and neonatal tetanus. Purple spots are physically attributed to lack of oxygen in the infant from respiratory failures, often caused by ARI and infrequently by NT in the Altiplano.

Health personnel need to realize that jinchukañu is a syndrome that symbolizes several serious diseases as well as magical and mythological realities for Aymara peasants. In many instances the mother is blamed for attacks by jinchukañu because she has not guarded the infant. This can be used to motivate her to be vaccinated with TT as a way to prevent one form of jinchukañu which results in infected umbilical cords, rigidity, and death.

F. Treatment by Curanderos

Curanderos of Zora Zora diagnose jinchukañu by giving the infant a drink of wilkachapi to see if the infant will vomit, a positive sign of jinchukañu. They then place on the infant's stomach a poultice prepared from toasted and crushed yellow pepper seeds. They also have the infant drink a mate of cochinilla, traditionally used for red dye. Curanderos say they can cure some infants of jinchukañu, probably when this represents minor respiratory diseases and milder forms of diarrhea.

G. Rituals

If the symptoms of jinchukañu persist, curanderos perform rituals of turqa. Turqa is the sacrifice of a black male animal (guinea pig, chicken, or pig) in exchange for the ajayu of the infant. Blood is sprinkled around the courtyard, and the curandero calls the name of the infant so as to recover its ajayu. This ritual is commonly called willancha.

Protestants of Zora Zora have a variation to turqa for curing jinchukañu in that they gather around the infant in prayer and rub its body with the Bible. When this fails, they call a curandero. Interestingly, several had doubts about Protestantism when their children died of jinchukañu and reasoned that if they had remained Catholic they would have called the curandero sooner.

These data show that jinchukañu is a syndrome of deadly diseases for infants, but which is perceived by Aymara peasants within a religious-mythological framework where ritual is the culturally preferred treatment. It is difficult to convince them otherwise because this belief is culturally validated and resists the facts of empirical science. However, health workers can adapt medical therapies and prevention to infants with jinchukañu by consulting with curanderos and offering to assist them in the curing and prevention of jinchukañu. One way to do this is to have the curanderos perform a turqa ritual the night before the women are vaccinated. Auxiliary nurses in Culta and Zora Zora of the Curahuara de Carangas Province have collaborated with curanderos and have a 100% vaccination rate for children, according to Dr. Edgar Franklin, medical supervisor in this region. They have recently begun TT vaccinations for women.

H. Perceptions of Vaccinations

Peasants unfavorably perceive vaccinations because they do not know what they are for, fear reactions, and think they will be sterilized. Peasants favorably perceive vaccinations because they realize that immunizations protect them and that relatives have received them with success. An important reason is imitation. As one lady said, "Han vacunado a mi tía, a mi prima, a mí también" ("They have vaccinated my aunt, my cousin, and also me"). Another motive is fear of contagious diseases, "Por susto, yo temo otras enfermedades, como viruela van a venir" ("For fright, I fear other diseases, like smallpox is going to come"). Aymara of the area of Tótora were favorably disposed to vaccinations because health personnel had educated them.

I. Traditional Concepts Useful for Vaccinations

One concept that can be used to promote vaccinations is to remind Aymara how in past times vaccinations wiped out smallpox. They still recount how some peasants vaccinated themselves with pus from another's sores. Another example was an auxiliary nurse explaining how alfombrillo, measles, had been stopped in a community where he had vaccinated all the children, but in another community they had refused and many children had died.

Health workers can talk about jinchukañu, as a syndrome which can be caused by several diseases, ARI, diarrhea, meningitis, septicemia, polio, and tetanus. Some of these diseases can be prevented by vaccinations. In the early months of life, infants can be protected from diphtheria, whooping cough, tetanus, and polio. However, some newborns of non-immunized mothers die from NT. They die a very painful death crying loudly, unable to breast feed, with their mouths and bodies rigid. They also have ataques or convulsions. This form of jinchukañu is called NT, and it can be prevented by vaccinating the mother with TT. If she receives vaccinations of TT, her children will never die from NT, one form of jinchukañu.

Because Aymara perceive several diseases within a symbolic context which includes social, cosmological, and physiological factors, it is advisable to take a similar holistic approach in dealing with these diseases. For example, instead of claiming that TT will prevent jinchukañu, which it will not, it is better to adapt to the complexity of this symbol and say that the mother, community, curandero, auxiliary nurse, and doctor need to do something. The mother needs to be vaccinated multiple times with TT, and the child three times with DPT (diphtheria, pertussis, and tetanus), and once against measles and tuberculosis (BCG). The child should also receive drops on three occasions to prevent polio.

Members of the community, especially TBAs, need to provide sterile conditions for the delivery of babies. They also need to prevent diarrhea and administer ORT. Ironically, the fact that Aymara perceive diseases within such a holistic perspective as jinchukañu prevents health personnel

from adopting a simplistic and mechanistic approach to eliminating tetanus, as well as other diseases, some of which are intimately linked to economic, social, and cultural factors.

J. Strategies for Immunization

It is important that vaccination campaigns not be scheduled during July, August, and September because this is the cold season with the highest incidence of diseases. If children recently vaccinated die from some undefined disease, then frequently peasants attribute death to the vaccination because of a temporal association. Another reason is that women are frequently involved in preparing fiestas and fields during these months.

One effective way of scheduling vaccinations is that done by health personnel of Totorá. The local physician, auxiliary nurses and CHWs meet with leaders from every community at the beginning of the year to decide when they want to be vaccinated. They set dates for three visits within each community. They carefully monitor the vaccination of women and children with lists and cards. Ninety two percent of children under five are vaccinated with completed schedules.

K. Social Communication Methods

The most effective method for promoting vaccinations which we observed in our field trip was that done by CHWs in Culta and Zora Zora, Curahuara de Carangas Province. These CHWs were elected by members of their communities in 1984. Deeply integrated in their communities, they slowly introduced vaccinations and used legends and examples known to their people. They taught in Aymara. They had the advantage of being known and accepted by members of the community. They were also better able to appreciate and resolve objections to vaccinations. Both communities now have 100% vaccination coverage for children, and they initiated TT for women in 1988.

CHWs are a very effective way of promoting and sustaining vaccination programs because they are established in the community and able to explain diseases and their prevention in cultural concepts in local languages. However, CHWs need to be trained to articulate modern concepts of vaccinations with traditional concepts of disease, such as jinchukañu. Anthropologists and health educators can assist them by publishing brochures and illustrated workbooks which provide examples of how to teach about NT and its prevention with TT vaccinations in concepts understandable to Aymara peasants.

Regarding jinchukañu, educators need to realize that this is a syndrome consisting of magical, mythological and symptomatic factors. In Zora Zora, for example, Protestants still accept it as a syndrome even though they do not believe in its magical causes. Jinchukañu also constitutes a mechanism of defense of the traditional culture because it puts into serious conflict those peasants who have abandoned their traditional beliefs.

Underlying themes useful for educators are that jinchukañu symbolizes something very aggressive against the infant, indicates the seriousness of the symptoms, and implies that the parents are responsible for neglecting the child. These themes can easily be transferred to the dangers of the tetanus microbe in attacking the infant, the devastating symptoms of NT, and the irresponsibility of the mother not to have been vaccinated.

Doctors and auxiliary nurses need to examine carefully infants with jinchukañu to ascertain from this syndrome which ones correspond to modern pathology. Health personnel contend that NT is not found (recognized) in the Altiplano, but if they question peasants about jinchukañu, they will find it in a minority of these cases.

L. Culture Specific Approaches

The MPSSP might like to follow these culture-specific messages and approaches for TT delivery among the Aymara. Because tetanus is not specifically known, a description in Aymara of its symptoms, as found above, could be printed on vaccination cards. Explanations could be given about reactions, vaccination schedules, and reasons why women from ages 15 to 44 need to be vaccinated. Doses should be explained in meaningful terms.

A culturally appropriate symbol for the card would be that of the Virgen de Copacabana, which symbolizes fertility, protection, motherhood, Mother Earth (Pachamama) and earth. The color of the cards could be bright pink, a favorite color of Aymara women. The card should be large with several illustrations symbolizing protection, such as a mother guarding her infant, a dog protecting some lambs, and a cat chasing away rodents. The term, jinchukañu, should not be used on the card because it may not be universally understood by Aymara of the Altiplano. The above suggestions need field-testing before adoption.

VII. RECOMMENDATIONS

1. NT was reported with varying intensity throughout the areas visited among the Tupi-Guarani, Quechua, and Aymara. The MPSSP's recent efforts to accelerate five vaccinations with TT for all women from 15 to 44 years old should continue. This is likely to have a major impact on NT reduction. Even though NT appears less among the Aymara in the Altiplano, the MPSSP could continue to vaccinate Aymara women who frequently travel to and deliver in areas where NT is endemic.
2. The MPSSP needs to tailor health education messages concerning NT and TT vaccinations to each of the Tupi-Guarani, Quechua, and Aymara cultures. Education should be in the language respective to each group, and the message that NT can be prevented by vaccinations should be communicated using accurate convergent concepts understandable to members of these cultures. Among these cultural groups, there is regional variation in their understanding of NT, so educators need to adapt lessons to each area.

3. Health educators need to be careful to focus on the specific symptoms of tetanus identified by each culture as being prevented by TT vaccinations. This is to avoid misperceptions by the peasants that all the symptoms of the culturally defined syndromes will be prevented by TT vaccinations. Symptom complexes, such as bewitchment, jinchukañu, and pasmo de ombligo often include symptoms caused by diseases other than tetanus. Educators could emphasize that various types of vaccinations are needed to prevent some of the symptoms of these culturally defined illnesses.
4. The MPSSP needs to give more attention to training and supervision in proper and sterile vaccination techniques. People complained about improper and painful injections. They reported use of the same needle without sterilization for as many as ten people. They reported reactions that were attributable to unsterile needles and to misdirected inoculations. Some reported wrong vaccinations, as in the instance of injecting women with DPT instead of TT. People in Santa Cruz said that the cold chain was sometimes broken and people were given useless vaccinations.
5. The MPSSP is encouraged to introduce into the curricula of health training institutes information about tetanus and opportunities for students to improve their cross-cultural communication skills. Health personnel reported spending 10 to 60 minutes learning about tetanus and its prevention. Some indicated misinformation and ignorance about tetanus. Many believe that it does not exist in their areas, which can frequently be attributed to lack of knowledge and their inability to communicate cross-culturally. Peasants frequently reported that health personnel could not communicate with them.
6. The MPSSP could consider recruiting and placing personnel in health posts who speak the native language and who are knowledgeable about the culture of the area. The two auxiliary nurses with the best vaccination performance were natives of Culta and Zora Zora and had served four years as CHWs in these communities. Their participation in community and cultural affairs helped them obtain 100% vaccination coverage, according to the area's medical director.
7. The Episcopal Conference of Bishops of the Catholic Church in Bolivia could be requested to issue a statement fully endorsing TT immunization of women. Recent statements by Pope John Paul II supporting immunization during his visit to Bolivia might be included in this endorsement. This statement should be distributed in a pastoral letter to be read in all parishes in Bolivia. It could also be published in Presencia. Moreover, bishops in all dioceses need to continue to support a health pastoral which promotes TT immunization. There is widespread belief among Catholics that TT vaccinations sterilize women, which is against papal teachings. People said this was one reason why they did not want to be vaccinated. It was also reported that Catholic clergy in many parishes had wholeheartedly supported vaccination programs.

8. Doctors and auxiliary nurses in rural areas could train traditional TBAs to deliver babies with sterile instruments. The use of broken ceramic or glass to cut the umbilical cord must be replaced with use of a sterilized knife. TBAs must not put unwashed cotton or cloths on the umbilical cord, nor should they tie it with dirty string. They should not put talcum powder, medicinal plants, or dust from the door on it. Before delivery, TBAs must be cautioned to wash their hands and clean their fingernails, and mothers should wash the sheepskin placed below the baby.
9. Health personnel need to coordinate efforts with TBAs and curanderos in promoting TT vaccinations. Peasants reported that they were not vaccinated because traditional practitioners advised against this. Auxiliary nurses and doctors could explain to traditional practitioners the symptoms of NT and how they can be prevented by vaccinations. If health personnel have some appreciation of culturally-defined syndromes, they will be able to collaborate specifically by showing curanderos how particular symptoms can be prevented by TT vaccinations. Health personnel can then give the curandero credit for advancing the public health in the community. This avoids a power struggle between the curandero and auxiliary nurse.

VIII. FOLLOW-UP ACTION REQUIRED

It is suggested that the above recommendations be reviewed by the Inter-Agency Coordination Committee and implemented by the MPSSP. In particular, culturally appropriate health education messages need to be designed and field-tested. Opinion leaders (including the Church) need to be mobilized in support of accelerated neonatal tetanus control. It is important that a medical-anthropological perspective be included to ensure some cultural sensitivity in this process.

APPENDIX 1

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APPENDIX 2

PLACES VISITED AND PEOPLE INTERVIEWED

La Paz:

1. Dr. Maria Teresa Paz, MPSSP, Subsecretaria.
2. Dr. Jorge Mariscal, MPSSP, Director Epidemiología.
3. Lic. Ronald Lagrava, MPSSP, Director Planificación.
4. Mr. Victor Gillerico, MPSSP, Sección Estadística.
5. Dr. Alberto de la Galvez, US, Materno Infantil.
6. Dr. Roxana de la Vega, Dir. de Infecto-Contagioso y Catédrica.
7. Mr. Michael Hacker, USAID, Health and Human Resources.
8. Mr. Paul Hartenberger, USAID, Health and Human Resources.
9. Dr. Temístocles Sanchez, PAHO.
10. Lic. Nazario Tirado, UNICEF.
11. Dr. Airton Fishmann, PAHO. Consultant.
12. Lic. Wally Chastain, Director of Project Concern-Bolivia.
13. Lic. Emil Steinkrauss, Consultant.
14. Mr. Mario Salcedo, Kallawaya herbalist in La Paz.
15. Mr. Nestor Llaves, Kallawaya herbalist in La Paz.
16. Mr. Ramon Quispe, Kallawaya herbalist in La Paz.
17. Representatives from PAHO, UNICEF, USAID, the Coordination Program in Child Survival, Rotary, and MPSSP; Interagency Coordination Committee Meeting. (Two meetings).

Department of Oruro:

1. Dr. David Choque, US, Director, Oruro.
2. Dr. Jorge Cuiza, US, Epidemiología, Oruro.
3. Lic. Nilda de Gutierrez, US, Epidemiología, Oruro.
4. Dr. Ponciano Jimenez, US, Director de area, Oruro.

5. Dr. Walter Humacayo, US, Jefe Materno Infantil, Oruro.
6. Lic. Griselda de Bellot, Director Project Concern, Oruro.
7. Dr. David Morales, Medico,Clinica San Pio Decimo, Oruro.
8. Ms. Yolanda Fernandez, Auxiliary Nurse, La Joya.
9. Mr. Maclobio Mamani, Técnico, CARE, La Joya.
10. Ms. Antonia Gomez, Curandera, La Joya.
11. Ms. Alejandrina Mamani, Auxiliary Nurse, Choquecota.
12. Members of Mothers' Club, Choquecota.
13. Lic. Mario Fernandez, Teacher, Choquecota.
14. Mr. Hilarion Condori, TBA, Choquecota.
15. Mr. Norberto Mamani, Auxiliary Nurse, Culta.
16. Members of Mothers' Club, Culta.
17. Mr. Celestino Lara, Auxiliary Nurse, Zora Zora.
18. Members of Mothers' Club, Zora Zora.
19. Unidentified Informant, Zora Zora.
20. Auxiliary Nurse, Totora.
21. Registro Civil, Totora.
22. Curandero, Totora.
23. Mr. Olimpio Choque, curandero, Calasaya.

Department of Cochabamba:

1. Dr. Alfonso Arzabe, US, Director, Cochabamba.
2. Dr. Martha Montecinos, Director, Escuela de Salud Publica.
3. Dr. Alberto Corrales, Director, Centro de Salud, Cochabamba.
4. Dr. Walter Salinas, Director, Maternológico, Cochabamba.
5. Lic. Jorge Silva, US, Tecnico-epidemiólogo, Cochabamba.
6. Dr. Roberto Agudo, US, Medico-Epidemiólogo, Cochabamba.

7. Dr. Antonio Quiroga, Medico, Hospital Mexico, Cochabamba.
8. Dr. Guido Ballesteros, Medico, Hospital Mexico, Cochabamba.
9. Ms. Maria D'maman, US, Educator, Cochabamba.
10. Dr. Joaquin Villarroel, Doctor, Cocapata.
11. Ms. Matilda Roja, TBA, Cocapata.
12. Ms. Asunta Siles, TBA, Cocapata.
13. Ms. Mikias Calle, TBA, Cocapata.
14. Ms. Maria de Perez, President, Mothers' Club, Tres Estrellas.
15. Ms. Antonia Zapata, Auxiliary Nurse, Choro.
16. Ms. Laberia Cuentas, Mother, Vizcaino.
17. Dr. Raul Maldonado, Doctor, Capinota.
18. Lic. Bernardo Rocabado, Director de Centro de Promoción Campesina. Capinota.
19. Ms. Marta Soto, Auxiliary Nurse, Mothers' Club, Capinota.
20. Members of Mothers' Club, Capinota.
21. Members of Mothers' Club, Cooperativa.
22. Members of Mothers' Club, Buen Retiro.
23. Members of Mothers' Club, Sarcobamba.
24. Members of Mothers' Club, Sarcopucho.
25. Maestros de la Escuela de Sarcobamba.
26. Ms. Ernestina Cutipa, Mother, Cooperativa.
27. Ms. Bertha Lázaro, Mother, Capinota.
28. Ms. Julieta Zañga, Auxiliary Nurse, Buen Retiro.
29. Ms. Zañga, TBA, Buen Retiro.
30. Mr. Maclovio Paco, Curandero, Arque.
31. Fr. Julio Cesar Aguilar, Pastor, Capinota.
32. Vaccination Technicians, Maryknoll, Capinota.

Vallegrande and District 3 of Santa Cruz:

1. Sr. Corona Heim, Nurse, Hospital in Comarapa.
2. Doctor, Hospital in Comarapa.
3. Mr. Prospero Aranivar, Notary, Comarapa.
4. Dr. Anuncio Talamaz, Director of Hospital, Vallegrande.
5. Fr. Rene Haem, Parish Priest, Vallegrande.
6. Lic. Pastor Aguilar, Veterinarian, Writer, Vallegrande.
7. Ms. Mirea Carrasco, Auxiliary Nurse, Vallegrande.
8. Mr. Juan Vivancia, Curandero, Vallegrande.
9. Lic. Adelaida de Ovaes, Nurse, Vallegrande.
10. Ms. Flora Godoy, Auxiliary Nurse, Vallegrande.
11. Ms. Lola, Curandero, Trigal.
12. Ms. Melchora Osinaga, Curandero, Trigal.
13. Conjunto Vecinal, Trigal.

Santa Cruz and Montero:

1. Dr. Ronald Rivero, Director US, Santa Cruz.
2. Dr. Luis Nuñez, Epidemiología US, Santa Cruz.
3. Dr. Christian Darras, Planificación US, Santa Cruz.
4. Dr. Gladys Roca, Jefe de Materno Infantil US, Santa Cruz.
5. Dr. Luis Santa Cruz, Doctor, Prosalud, Santa Cruz.
6. Dr. Jose Zambrana, Presidente, Sociedad Pediatría, Santa Cruz.
7. Dr. Ruben Poma, TV Producer, Anthropologist, Santa Cruz.
8. Dr. Aguires Gomez, Medical Researcher, Santa Cruz.
9. Dr. Nora Siles, Director of Planning US, Santa Cruz.
10. Dr. Dardo Chavez, Centro de Salud, Montero.

11. Dr. Alfonso Sanchez, C. Medicina Preventiva, Montero.
12. Dr. Clever Morón, Pediatrician, Childrens' Hospital, Montero.
13. Dr. Gloria Torrico, Pediatrician, Childrens' Hospital, Montero.
14. Lic. Juana Zeballos, Director of CHWs and nurses, Montero.
15. Mr. Juan Ramos, Curandero, Montero.
16. Ms. Catalina Araúz, Curandera, Montero.
17. Mr. Victor Rojas, Curandero, Montero.
18. Ms. Carmen Hurtado, Curandera, Montero.
19. Ms. Ernestina Vargas, Mother of NT Victim, Montero.
20. Mr. Pedro Simore, Health Statistics, Montero.
21. Dr. Dolly Montaña, Researcher NT, Montero.
22. Dr. Renato Amonzabel, Doctor, Hospital, Jorachito.
23. Mr. Germán Gonzales, Auxiliary Nurse, Jorachito.

APPENDIX 3

Incidence of NT in Hospital Dermatológico de Jorachito, Santa Cruz.

<u>Year</u>	<u>Incidence</u>
1983	7
1984	5
1985	6
1986	8
1987	13

Source: Perfecta Aldana, Sección Estadística, Santa Cruz.

APPENDIX 4

Questionnaire on Tetanus (translated from Spanish)

1. What do they call tetanus in your community?
2. What are the symptoms of tetanus?
3. How do traditional curers treat tetanus?
4. What are some rituals used to treat tetanus?
5. What causes tetanus?
6. How can tetanus be prevented?
7. How many vaccinations are necessary to prevent tetanus?
8. Where can you receive these vaccinations for tetanus?
9. What are some reasons why people refuse to be vaccinated?
10. What are some reasons why people want to be vaccinated?
11. How do people prevent sicknesses?
12. Provide an explanation for members of your community to motivate them to be vaccinated.
13. Tell us a story or legend to show the importance of being vaccinated against tetanus.
14. How can access to vaccinations be improved?
15. What are the reactions to TT?
16. Do mothers object to speaking about sicknesses and deaths of their infants?
17. Through what associations or clubs can mothers be educated about TT?
18. What are some beliefs against TT vaccinations?
19. What are some beliefs in favor of TT vaccinations?
20. In your community what classes or groups of people seldom receive vaccinations?
21. In your community what classes or groups of people most frequently support vaccination campaigns?

22. How do vaccinators treat you?
23. What strategy do you suggest for reaching and vaccinating more people?
24. (For investigator) What impressions do you have about concepts, symbols, strategies, cognitive patterns, and folklore that might be used to motivate the people to receive TT?
25. If any cases of NT are discussed, include details of these cases.
26. (For investigator) What conclusions do you derive from informants' answers.

Additional Questions for Mother

1. Was your baby born alive and developed well during the first two weeks?
2. Did your baby suck at the breast during this time?
3. Did your baby stop sucking at the breast or have problems of eating within fifteen days after birth?
4. Did your baby have a rigid mouth or a permanent smile?
5. Did your baby suffer from convulsions?
6. What reasons did mother give for baby's death?
7. How did they cut the umbilical cord of the baby?
8. Did they put anything on the umbilical cord after cutting it?