

PROJECT AMAZONAS, INC. MEDCAP INTRODUCTORY MANUAL

UPPER AMAZON RIVER REGION



DEPARTMENT OF LORETO PERU, SOUTH AMERICA

PROJECT AMAZONAS, INC.

Medical Civil Action Purpose (MEDCAP) Program

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PROJECT AMAZONAS, INC., - INTRODUCTION AND MISSION STATEMENT

Project Amazonas, Inc., is a non-profit, non-governmental organization dedicated to the protection and study of the Peruvian tropical rainforest and to the provision of medical and other services to its native peoples.

Project Amazonas, Inc., was incorporated as a non-profit organization in 1994 in the State of Florida (IRS non-profit identification #65-0515019) and in the Republic of Peru, where it is officially known as ‘Asociacion Civil Proyecto Amazonas’. The activities of Project Amazonas are overseen by a board of directors with US and Peruvian members. Board members donate time and services, and receive no compensation from Project Amazonas.

MEDCAP PROGRAMS

The objectives of Project Amazonas MEDCAPs (medical civil action purpose programs) are to promote, coordinate, and/or initiate humanitarian, medical, research, sustainable development, and educational activities in the Amazon region (Department of Loreto) of the Republic of Peru. These objectives and activities are briefly summarized below.

Medical Activities:

- Coordination of health-related activities with the Peruvian Ministry of Health and with the local medical establishment.
- Provision of regular and modern health services and education to the inhabitants of remote river communities, while emphasizing self-reliance and the use of effective traditional remedies and treatments.
- Solicitation of donations of medicines, medical supplies, reference materials and equipment for the conduct of MEDCAP operations. Coordination and distribution of shipments of donated medical materials to hospitals, clinics, and doctors in the Department of Loreto.
- Training of health workers in remote communities for the treatment of independently manageable ailments. Provision of these health workers and communities with basic medical kits, as well as provision of instructional materials for the teaching of preventive medicine lessons by health workers and teachers.
- Arranging and coordinating visits to the Peruvian Amazon by volunteer health and development professionals, and by appropriate student groups, for the purposes of contributing services and training, and/or participation in health/educational training activities.
- Initiation of child health programs in the areas of infectious disease and nutritional health.
- Treatment of medical conditions where possible, while emphasizing disease prevention (health education) and the cultural preservation of effective traditional remedies and health practices.

Research Objectives, Information, and Proposals:

- Rapid diagnostic methods for use in remote areas.
- New advances and drug therapies for the treatment and prevention of endemic disease problems.
- Ethnobotanical and pharmacological research into the effectiveness and potential widespread use of traditional herbal remedies.

- Program innovations in preventive medicine, traditional medi-culture appreciation, sustainable development projects.

Sustainable Development Projects:

The promotion of sustainable harvesting and conservation of forest resources (along with provision of adequate health care) has the potential to enhance living standards in rural areas and help slow the migration of people from forest communities to the cities. Sustainable development projects that enhance health and living standards in traditional rural settings also enhance long-term conservation prospects for the Amazon rainforest, as people who know the forest best, and who value it for a very wide range of products, are the least likely to cut it down for large scale (commercial) timber harvest and cattle ranching. People in many rural communities probably enjoy a healthier environment than that found in the squatter camps and shanty-towns in which many rural people are forced to live when they migrate to the cities. Development projects in the past have included training in small-scale timber harvesting techniques, ornamental fish collecting, pottery, woodworking and related activities. Such activities, properly managed, add considerable value to maintaining the rainforest in a natural or semi-natural state, and can discourage widespread clear-cutting for lumber and grazing.

Facilities, Transportation and Staff:

Project Amazonas maintains three field stations in the Peruvian Amazon. Two are on the Rio Orosa, and one on the Rio Apayacu, close to communities served by the MEDCAP program. Stations are equipped with housing, shower, toilet, and cooking facilities, and extensive trail networks are accessible.

The Project Amazonas river launch, the *B/F Tucunare* is self-contained and equipped to transport medical volunteers as needed. This wooden vessel has a completely furnished kitchen (including stove, sink and freezer), bathrooms, safety equipment, sleeping bunks, dining areas and partially open upper deck and can sleep 12-14 persons. Additional passengers can be accommodated in tents on shore or on the upper deck. Local people are employed as assistants, guides, and cooks, and accompany visitors during activities, operate generators and river craft, provide plant and animal identifications, maintain facilities, cook meals, translate, and assist in daily MEDCAP activities in the communities visited. A covered aluminum skiff with a 100 hp outboard, the *Mai-Kai*, provides for rapid transportation and emergency evacuations. A smaller (21 foot) open skiff powered with a 60 HP motor provides additional mobility. Additional information about facilities can be obtained at: <http://www.projectamazonas.com>

Program Development Interests:

- Networking among colleagues in tropical medicine, preventive medicine and various humanitarian endeavors
- Coordination with teaching institutions to promote student and or faculty participation in medical programs.
- Solicitation of donations of medicine and medical supplies--potential donors are encouraged to inquire about our needs in this area.
- Establishment of contacts in epidemiology and tropical and infectious disease monitoring to serve as resources for medical personnel, and who can help maintain awareness of up-to-date health information and statistics.

PROLOGUE

Participants in MEDCAP Programs are encouraged to read this document and familiarize themselves with the range of information it covers. The geographic coverage of this manual is limited to the upper Peruvian Amazon region (Department of Loreto) where the medical work of Project Amazonas is conducted. Not all of the information presented here may be applicable to other geographic locations.

PROJECT AMAZONAS, INC. – MEDCAP MEDICAL MANUAL

This introductory manual is not comprehensive, and will be periodically updated. It is provided only as an introduction to the primary medical problems likely to be encountered by the visiting health professional, as well as to environmental, social, and political factors that impact health and the provision of health care in the region. The information presented has been gathered through the observation and experiences of the authors, and from various governmental and non-governmental sources. Corrections, additional information, and suggestions are all welcome, and will help make this document more useful for future MEDCAP participants.

PHYSICAL ENVIRONMENT

Geography and Climate

The Peruvian Amazon region, including the principal city of Iquitos is located close to the “heart” of the South American continent in the western Amazon Basin. Although located some 2400 river miles from the Atlantic Ocean, the elevation of the region is only 300’-350’ above sea level. The Pacific Ocean is only about 600 miles distant, but difficult to access due to the intervening Andes Mountain range. The Peruvian capital, Lima, is some 700 miles SSW of Iquitos, and daily flights (1.5 hours) provide direct access. Iquitos is about 3.5 degrees south of the Equator.

The region has low topographic relief and a warm, wet climate, with about 3,000 mm of rain per year. The dominant vegetation is lowland tropical rainforest, and numerous rivers and streams are the main arteries of travel and transportation. Temperatures average 26° Celsius, with approximate highs of 34°C and lows of approximately 21°C. River levels rise and fall dramatically throughout the year. The yearly change in water levels on the Amazon and other large rivers ranges from 35 to 50 feet (11 to 16 meters). Variation in water levels on smaller rivers is less, and depends in part on the size of the watershed and proximity to larger rivers.

Seasonality

Most rainfall occurs between the months of November and May with the dry season occurring between July and October, but there is some annual variation in seasonality. Temperatures and humidity are generally higher during the rainy season, but it is easy to become chilled in heavy or prolonged rain. In the dry season, short hard rains do occur, but may be separated by several days without rain. The dry season is known as “verano” or summer, since days are primarily sunny and feel warm. Nighttime temperatures during the dry season are notably cooler than during the wet season, however humidity is also lower and people rarely complain of being cold. Low water levels at the end of the dry season leads to greater incidence of gastrointestinal problems as water quality deteriorates, and as smaller streams that are used as sources of drinking and cooking water dry up.

In the wet season, rainfall is a daily occurrence, with heavy rainfall occurring primarily during the afternoon or at night. All-day rains are not the norm during the wet season, but do occur. They also occur rarely during the dry season when fronts move through the area. The rainy season is known locally as “inverno” or winter, due to the increased cloud cover and the chilling effects of the rain and high humidity. Incidence of respiratory infections increases during the rainy season.

COMMUNITY AND SOCIAL ENVIRONMENT

Community Physical Structure

Iquitos is the largest city in the region, with a population nearing 500,000. The next largest towns are Requena, Indiana, and Nauta, with populations of 5,000-10,000. Local administrative centers such as Yanashi, Huanta, and Orellana have populations of 500-2,000. The vast majority of communities in the region, however, are quite small, with 100 to 350 inhabitants. In general, communities of 1000 persons or more will have a government clinic (although

it may not be well supplied). Most communities of 1,000 people or more will also have a diesel generator (with 3-5 hours of power daily, provided fuel is available), concrete paths, government administrative offices, a secondary school, and short-wave radio or satellite phone service. Cellular phone coverage is currently being extended to areas along the main rivers both up and down-river from Iquitos. Smaller communities will lack many of the above amenities. Most communities are composed of a group of dwellings stretched out along a riverfront for a kilometer or two, with all or most dwellings boasting waterfront views. A trail along the river's edge will connect the community, with bridges over small creeks. The marks of an established community are the presence of a school with associated soccer field, and a health post. The school is generally considered the center of the community, and also serves as a general meeting hall.

In the smaller communities, typical dwellings are constructed out of readily available materials. Rot-resistant heartwood posts support the dwelling, with a floor of boards or split palm trunks located 4-6' off the ground. Part of the house may be boarded up to provide a closed room, but generally most of the dwelling area is open on the sides, though a rail is generally present. A smaller kitchen platform is generally attached to the house by a short walkway. The raised floors help keep out domestic animals, snakes and arthropods, and aid in maintaining general cleanliness. Raised floors are also necessary in many areas to keep the living area above floodwater, and the open sides of dwellings help keep the interiors dry and cool. Palm thatch roofs are the norm throughout the area, and communities close to areas with concentrations of the favored thatch palm derive considerable income from harvesting the palm fronds, and fabricating roofing segments for sale to more distant communities, or even for export to Iquitos.

In larger communities (Yanashi, Huanta, Pevas, etc.), houses are more likely to be entirely walled, and houses on higher ground are often not raised off the ground. Some or many houses will have galvanized tin roofing. Photos of typical houses in both smaller and larger communities can be viewed on the Project Amazonas web site.

In smaller communities, schools only offer the first three grades, but by the completion of three years, students can read, write, and do basic math. Instruction is in Spanish, with a very few schools also teaching indigenous languages. In larger communities, 6 years of instruction may be offered. To attend school beyond six years, students have to board in Pevas, Indiana, Iquitos or another large community. Most children in small river communities only complete the requisite three years of schooling, and for many, attendance may be sporadic. School holidays often coincide with harvest season. The Fujimori administration (1990-2000) had an aggressive school building program, consequently most communities do have modern concrete block/tin roof school buildings. Teaching materials and supplies deteriorate rapidly in the warm humid climate, however, and are frequently in short supply. Equipment consists primarily of a blackboard, desks or benches and tables, a few books, and little else. Many schools suffer from a high level of teacher absenteeism, particularly where teachers from larger cities have been "assigned" by the government to teach in a remote school.

Community and Family Social Structure

Communities are democratically organized, with a popularly elected head-person ('teniente', or lieutenant). In some communities, the shaman or traditional healer also holds a position of prestige. Community meetings are held to discuss matters of importance to the community, and all adult members of the community, including women, are free to speak. In remote communities, much decision-making is effectively made by the adult male members of the community, but women do have a strong influence. Women are very active in Peruvian politics in general, and hold important positions in both local and national governments.

Within a community, many or most families participate in a cooperative work group known as a 'minga'. Members of a minga (consisting of from 5 to 30 families) plan work-bees for clearing fields ('chacras'), harvesting crops, building houses, etc. Such events are also important social occasions which usually include the drinking of 'masato' (a fermented yuca [manioc] drink) or other alcoholic beverages. Some agricultural products are sold for cash or bartered,

but participation in the market economy generally depends on other activities. Exceptions include communities like Yanashi, an important rice producing area, and communities closer to Iquitos which provide the city with plantains, yuca, and other local crop items. Families relying on market economics (logging, fishing, oil industry, etc.) generally have their own garden patches, but may not participate in mingas to the extent that other families do, and consequently may not have a social ‘safety net’ available to them if their economic situation takes a downturn.

A number of different Indian tribes are represented in the region. Most people in the area downriver from Iquitos, where Project Amazonas operations are centered are members of the Yagua ethnic group. Other tribes represented in nearby areas include the Bora and Witoto (or Huitoto) Indians. Some smaller tribes are on the verge of cultural extinction due to intermarriage and the homogenizing influence of modern culture. Hundreds of years of Amazon River traffic by traders, adventurers, missionaries, and government officials has also resulted in considerable mixing of bloodlines, and many people are not 100% “anything”, with some showing considerable Caucasian or Oriental influence. There is little African influence in this area of Peru. "Yagua", of the Arawak language group, is rooted in the Tucanoan language, as is Quechua. “Quechua” is used by outsiders to describe all native languages of the area. Virtually all people in the area (except for some very old people in a few communities) speak Spanish, however, and Spanish is the language of education, business and government. Ethnicity does not appear a factor of significance in daily life unless economic class differentiation is involved (primarily in urban areas). Clans, farming groups, religion (for certain sects), and community governments mark the principal distinctions between groups. Discrimination against people of Indian or mixed blood is uncommon in Loreto, as the overwhelming majority of the population falls into these categories.

Until 1999, all males were required to perform two years of military service beginning between the ages of 16 and 18. This (now optional) service was generally performed outside of the immediate area, consequently most adult males have experienced other, more developed portions of the country. Males consequently have a broader world view than women, many of whom rarely leave local communities, and who may never even have traveled as far as Iquitos (a trip that can require several days from more remote communities). All adult Peruvians (male and female) are required by law to vote in national and local elections, consequently politics is a matter of discussion even in the most remote communities.

Family structure is basically patriarchal, with the man of the household hunting, fishing, harvesting forest products, clearing the garden area, and conducting most financial exchanges. Women and older children take care of the younger children, tend to the garden, make various items of daily use, etc., as well as gather forest products. Work roles are not rigid, however, and it is not uncommon to see men or women engaging in activities that would ordinarily be considered to be the domain of the opposite sex.

Religion

Most people in rural areas are nominally Catholic, but Catholicism appears to play a minor role in daily activities, and many communities may be visited by a priest or nun only once or twice a year. Larger centers such as Yanashi and Pevas have Catholic missions with associated schools. In more urbanized areas, and even smaller communities close to large urban centers, various Protestant and other sects are acquiring substantial numbers of followers. Members of two ‘home-grown’ religious sects are likely to be encountered during Medcap expeditions. The older of these sects is the ‘Hermanos de la Cruz’ (Brothers of the Cross), a sect which originated in the headwaters of the Amazon and which originally had an anti-gringo and anti-development mandate. It should be noted that among indigenous people in the region, the term ‘gringo’ (the term is not derogatory) denotes anyone (including Peruvians) of European or mixed descent. The sect likely originated as a response to institutionalized discrimination and neglect of indigenous populations. The community closest to the Madre Selva field station is an ‘Hermanos de la Cruz’ community, and there are a number of other communities in the region. While members of the community observe various sect practices, they are by no-means anti-‘white’, and are as good neighbors as any of the other communities in the region.

The sect does not proselytize much, and may be in the process of dying out.

A more recently established sect is the 'Israelitas' (Israelites), which originated in the mountain and coastal areas of Peru. The Israelitas were led by a charismatic leader who had a vision that he and his followers should move to the Amazonian region of Peru where paradise would be established. Since approximately 1995, thousands of Israelitas have moved to the region, with the largest concentration settling in communities in the vicinity of Pevas. Members of the sect are easily identifiable, as men do not cut their hair or shave, and often wear robes, and women always wear long dresses and cover their heads. The Israelitas aggressively proselytize, and can be encountered preaching on the street in Iquitos and Pevas. Israelita communities experience a number of health problems unique to the area. As most of the members of the sect come from mountain or coastal areas, they are unfamiliar with farming, hunting and fishing in the Amazon, as well as with the uses of various medicinal plants, although they are learning quickly. Malnutrition is more common among Israelita children and babies than in the general populace, and skin and fungal infections are also common, probably due in part to their mode of dress (all of the body covered at all times, habitual wearing of shoes), and also to a lack of bathing on a regular basis. Icy mountain streams in the areas of origin of most of the Israelitas would not encourage the habit of frequent bathing! Problems with ectoparasites are probably also more common among the Israelitas than among the population at large. The Israelitas do welcome modern medicine, and are not 'anti-gringo'. The founder of the Israelitas, Ezequiel Atacusi, died in mid-2000 and his son assumed his role after Ezequiel failed to be resurrected after three days as expected. In recent years, the sect has lost many adherents and its future existence as an established entity is in doubt.

Demographic Information

Life expectancy in the Rio Orosa area is approximately 52 years. At the current time, infant and child mortality is approximately 10%, previously this was as high as 20%, and life expectancy was, of course, considerably lower.

ECONOMIC ENVIRONMENT

Urban Areas – Iquitos and larger towns

The largest city in the region, and the center of economic and governmental activity is Iquitos. The metropolitan area has a population approaching 500,000. The population of the Department ('State') of Loreto of which Iquitos is the capital has a population of approximately 1 million. The next largest towns in the area are Nauta, Requena, Indiana and Pevas, with populations 3,000 to 10,000 people. Iquitos and other towns in the area have no road connections to other parts of Peru or to neighboring Brazil, Ecuador or Colombia. All goods are transported into or out of the region by air or by river. Ocean-going freighters service Iquitos monthly (when water levels on the Amazon permit access), although it is some 2400 river miles from the Atlantic Ocean.

The principal economic activities in Iquitos are fueled by government (civil administration, military), petroleum exploration and extraction, logging, fishing, service industries, and tourism. Iquitos is serviced daily by several flights from Lima, Peru. Banking, telecommunications, hotel, and other services are readily available in Iquitos, including amenities such as numerous ATMs and cybercafes. Approximately 30% of all Peruvians now use the internet on a regular basis (as of Sept. 2007).

Rural Areas - Subsistence Agriculture, Hunting and Gathering

The majority of people in areas away from larger urban centers rely on subsistence agriculture, hunting, fishing, and gathering of forest products to meet their daily dietary and shelter needs. Traditional slash-and-burn farming methods are well adapted to poor Amazonian soils. Crops are produced for 2-4 years, followed by a long fallow period. Fields located in seasonally flooded white-water areas may be farmed for longer periods of time, since fertilizing silt is

deposited by the annual flood-waters. Generally, only small parcels of land are cleared, although some agricultural fields can be quite large when they are communally farmed, with some of the produce sold commercially. Most households also raise a small number of animals for consumption by the family, or for sale for essential items such as salt, sugar, tools, and clothing. There is little cash-crop agriculture in the area other than some rice and yuca. Cash for clothing, medical needs, tools, batteries, etc., is obtained by selling excess agricultural output, salted or fresh fish and meat, or by taking temporary employment in the industries discussed below.

Lumber Industry and Cattle Ranching

Neither of these activities were widespread or common in the area, although logging has increased dramatically in recent years. Currently, logging operations are still carried out in a selective manner, with 8-10 species of higher-value trees typically harvested. Most logging activities are done by hand, and there is little mechanization. Small caterpillars may be utilized for hauling logs to river edges, where logs are cabled together and floated downstream for eventual barge pickup and transport to sawmills (mostly in Iquitos), with no processing of logs taking place in the areas in which they are harvested. Employment opportunities are seasonal, the work is demanding and dangerous, and due to the temporary nature of the work, most laborers in the forest receive no benefits other than their direct salary (no social security, medical coverage, etc.). Loggers from remote communities are willing to work for lower wages than workers from urban centers, consequently most of the work is done by people from local communities. Commercial logging operations that clear-cut the forest are rare in Peru at the current time, but this could change in the future. Clear-cutting can severely lower biodiversity and destroy many resources that are utilized by local peoples. Such resources include building materials, food, medicines, roofing thatch, and more. Heavy logging equipment used in high impact logging compacts the soil, contributing to erosion and gully formation, with consequent silting of streams and rivers, and loss of soil fertility.

Large-scale cattle ranching is not yet common in the Peruvian Amazon region, but has the potential for inflicting severe environmental damage similar to, or worse than the effects of large-scale logging. The removal of forest canopy subjects the thin tropical soil to rapid erosion, and the establishment of pasture grasses severely inhibits forest regeneration. After a few years, the nutrients in the soil are depleted or leached out, and coarse grasses and herbs dominate, rendering the land effectively useless. Most cattle pastures in the region are small, and beef is neither exported nor consumed locally in any quantity.

Logging and ranching tend to occur first in flooded forest areas next to rivers. These areas have the highest soil fertility and easiest access. Flooded forests are, however, a critical habitat for many species of food fish, and the protein derived from these fish is comparable or superior in quality and quantity to that derived from cattle on the same land. Flooded forests also produce many other useful products such as fruit, building materials, and medicines.

Petroleum Exploration and Extraction

Petroleum exploration and extraction activities in the Peruvian Amazon occur primarily in the foothills of the Andes, and toward the Ecuadorian frontier, some distance from Project Amazonas' area of activities. Workers from Iquitos and surrounding areas provide the manual labor needed for these activities, however. For the majority of workers attracted to the oil camps, employment is for periods of less than two months, as the oil companies are under no obligations to provide benefits to "temporary" workers (i.e., those employed for less than two months). Petroleum industry workers may be exposed to a variety of health threats; exposure to crude oil and gas spills from drilling operations, exposure to toxic substances used in other aspects of the extraction or drilling process, etc. During the rainy season, toxins may be washed into the rivers killing fish, tainting the water, and even causing lesions on the skin.

Workers from isolated communities often fill any need for any menial or unspecialized labor needs, such as clearing and maintaining access lanes free of encroaching vegetation. Workers are often isolated in remote camps far from their

families and a supporting social environment. Repetition injuries, or other kinds of injury can cause disability and lead to termination of employment, with no prospect of disability benefits, and no long-term medical care or rehabilitation.

Illicit Drug Trade

Although coca (derived from the shrub *Erythroxylum coca*) is not commonly grown in the lowland Amazon basin itself (it prefers mid-elevation conditions), workers from lowland areas may be attracted to the coca fields by promises of high pay and fast profits. Health problems arise with the chemicals used in coca processing (i.e. acetone, kerosene or HCL). Spraying of coca fields for insects or fungal blights is also done by untrained workers without any protective gear. Workers may also be exposed to toxic herbicides sprayed during coca eradication missions. Young men are used to haul loads of coca paste through the jungle or to transport coca paste by small boat during transshipment from cultivation areas in Peru to processing centers in Colombia. In recent years, coca production in Peru has dropped dramatically due to eradication campaigns, the development of crop alternatives for coca farmers, and an improved economic climate within Peru. Political turmoil in Colombia has provided a favorable climate there for illicit drug production. What drug trafficking does occur in Peru is generally very low key, with traffickers anxious not to draw attention to their activities. There is little or no ‘narco-terrorism’ in Peru.

Tourism and Related Industries

A boom in eco-tourism to Peru and the Amazon region has contributed substantially to the local economy, but has potential negative effects as well. Exposure to tourists and the gifts they give can have the effect of emphasizing the ‘poor native’ syndrome in an indigenous group. Misguided tourist generosity in liberally giving gifts to “people who have so little”, emphasizes the lower economic class status of Amazonian people, encourages a “welfare attitude”, and can ultimately destroy the self-sufficiency and pride of rural people.

Because the tourist industry has grown so quickly, appropriate training for tourist guides, and the development of an eco-tourism code of ethics has lagged far behind. Tourist operations need boat operators, cooks, lodge managers, mechanics, and guides. These positions tend to be permanent for dependable, skilled tradesman, and for some rural people, has provided an opportunity to venture into the market economy. Most people employed in the tourist industry are urban dwellers, however, although many may have spent their childhood in rural areas. English fluency is particularly important in obtaining a good job in the tourist industry, and most rural people have little or no opportunity to study English. The consequence is that many tourists are introduced to the natural wonders of the Amazon by city people who may have minimal knowledge of the forest environment, and many wild and fanciful tales with no basis in reality are swallowed whole by gullible tourists.

Amazon tourism is not limited only to North American or European foreigners. Many tourists also come from large urban areas in other parts of South America (Lima, for instance). Such “internal” tourists may have less knowledge of, or interest in the natural history of the Amazon, and a greater expectation for seeing ferocious beasts and “wild Indians”, who are very clearly of a lower social and economic class. This latter aspect of tourism (by tourists from all areas) may reinforce the low esteem or shame that indigenous peoples have been taught to have with regard to their traditional roots and knowledge. Some communities put on “shows” for tourists for the income that is provided, but tourism by and large does not promote traditional values or the preservation of the cultural differences that draw visitors in the first place. Through relationships with culturally sensitive and socially progressive tour companies, however, tourism has the potential to enhance economic stability, self-sufficiency, and even ethnic pride.

Transportation and Communication - Rivers are the primary or only avenue of movement and communication in the most of the region. Disease spread follows the same river routes. Disease transmission may occur between river systems by over-land foot traffic by infected persons utilizing hunting trails, etc., however most movement between river systems is by boat.

STATUS OF HEALTH CARE IN THE REGION

Iquitos

There are several government operated hospitals and clinics in and around the city of Iquitos, as well as a number of private hospitals/clinics. The infrastructure and staffing of these facilities varies considerably, but there are capabilities for carrying out fairly sophisticated procedures at some hospitals and clinics. The largest hospital in the region is the ‘Hospital Regional de Iquitos’ with the capability of complex surgery, and equipped with sophisticated diagnostic equipment. Even in Iquitos, however, hospitals and clinics suffer periodic shortages of materials and medications.

The government provides free health care for certain conditions including cholera, malaria, TB, leprosy, and leishmaniasis. There is also a free prenatal care program and a birth control program. Patients that are seen with these presumptive diagnoses can be referred to the health centers for free diagnosis and treatment, as well as follow-up. Children that are registered in school also have access to free health care. Apart from the above categories, patients are required to pay for medical treatment and medications. If a person cannot pay, they will generally not be treated. These policies apply to rural areas as well. The government does periodically provide free medical attention, however, and various humanitarian groups also periodically offer free medical attention in Iquitos and surrounding areas, including such procedures as reconstructive plastic surgery (Interplast).

Government Health Care System in Rural Areas

In the Department of Loreto, the health system is organized into health centers (Centros de Salud), health posts, and, in smaller villages, ‘health promoters’. Health centers are small hospitals staffed by one or two physicians, along with nurses, aides, lab technicians and perhaps a midwife. In Project Amazonas’ area, there are two health centers: Yanashi and Pevas. Other health centers in the region include Santa Clara, Mazano, Indiana, San Pablo and Caballococha. Teams from the health centers try to visit the smaller villages periodically for vaccinations and training. Visit frequency is variable, however, and dependent on staffing, funds, gas and boat availability, etc.

Health posts are staffed by technicians (‘tecnicos’); a salaried position. The technicians have a working knowledge of medical issues and small stocks of medicines and supplies. In the Pevas region, health posts are located at Brillo Nuevo, Pucaurquillo, Huanta, and San Francisco. In the Yanashi area, health posts are present in Oran, Marupa and Francisco de Orellana. Most smaller villages have health promoters (discussed below). This is a non-salaried position that people are elected or volunteer for.

Pevas – Staffing and Infrastructure

The hospital in Pevas is typically staffed by an administrator, 1 or 2 doctores, one or more nurses, 2 lab technicians, an obstetrician, a pharmacy technician, and several aides. Medical records are kept on all patients seen, but are on paper only, and not necessarily readily available for review when a patient is evaluated. Electricity is available only from 6-10 PM by the city generator. There are 6 hospital beds in two rooms, with no linen on the plastic mattresses. IV fluids and IV poles are available, and the rooms reasonably clean.

There is a dental room with a nice dental chair, light, sink, and running water. The chair and light cannot be operated during the day as there is no electricity. In the Obstetrics room, a gynecological exam table is present. Speculums, gloves, swabs, and wooden fetal stethoscopes are available. The exam room has a BP cuff, thermometer, ophthalmoscope, otoscope, tongue blades, and a stethoscope. There is a table present, but no exam table. The treatment room has an autoclave (again, non-functional when the electricity is not running), various antiseptics, bandages, hydrogen peroxide, Gentium Violet, iodine, reusable gloves and some suture material. There are no cutting needles,

PROJECT AMAZONAS, INC. – MEDCAP MEDICAL MANUAL

casting or splinting material. The pharmacy has a spectrum of drugs including meds for various Government programs; mebendazole; antihistamines; steroids; some antibiotics; lasix; and a few cardiovascular drugs.

The lab has a light microscope in poor condition, with a missing eyepiece. When the electricity is on, another microscope can be used and is much better. Thick and thin blood smears, Gram stain, KOH, and stool samples can be done. There are no urine dipsticks or glucometers, and there is no micro-hematocrit or centrifuge capabilities. There is a delivery room and an OR, though the latter is un-equipped and hasn't been used in years.

Health Promoters ('Promotor de Salud')

As noted above, most small communities have a health promoter who volunteers, or who is elected by the community to the non-salaried position. Generally, health promoters are respected, and may be elected due to their competence or existing position in the community. In some communities, the health promoter is also the community lieutenant. Perks of being a health promoter include prestige, access to medicines, and periodic training in larger regional centers and Iquitos, with all costs covered. Health promoters play an important role in assisting personnel from regional health posts when they visit periodically to administer vaccinations, etc. The training seems to be fairly good, but few promoters seem to take a strong leadership role in the health of their community. This may be due to the fact that they are not generally paid for their services, and consequently must make a living for their families just like everyone else. Most health promoters have less than a 6th grade education – people with a higher level of education are often unwilling to remain in remote communities, preferring to take employment in larger towns and cities. Besides treating the ill, keeping records, and finding time to learn medicine, health promoters are expected to engage in the ordinary daily tasks characteristic of the community, including participation in a minga. Since health promoters are not generally paid (in cash, services, or goods) by community members for their services, the time that they can spend attending to medical matters or educating themselves about such matters, is necessarily limited.

The Peruvian Ministry of Health provides basic health promoter training in Iquitos when resources are available (which many be only every few years). A Catholic church mission in Yanashi has offered training in the past. There are 4 levels of health promoter with level 4 qualified personnel able to prescribe certain medications and suture. The instruction at Yanashi includes 'Centro Amazonico de Antropologia y Aplicacion Practica' (CAAAP) personnel who teach health subjects and who integrate medical and nutritional concepts, as well as catholic ideologies into the training. The book "Donde No Hay Doctor" (Where There is No Doctor) is an excellent training and medical care manual used in the training. During past visits to health posts in the area, some health promoters had medicines to treat many of the problems existing in the community, but did not have sufficient knowledge to make use of many of them.

The health promoter is generally readily accessible within most communities. For conditions requiring more advanced treatment or hospitalization, a health post is generally no more than a few hours distant (if a motorized boat is available). For cases requiring surgery or specialized care, several days travel may be required to reach Iquitos by public transport from the most remote areas.

HEALTH CARE ATTITUDES, CULTURE AND ETHNOGRAPHY IN RURAL AREAS

Traditional medicine and spiritual mysticism

The use of the hallucinogenic plant *Banisteriopsis caapi*, or 'Ayahuasca' is the foundation of art, religion, mythology, medicine and warfare for most upper Amazonian peoples. It is believed a spirit dwelling in the vine is liberated through its preparation. The shaman uses the drug to induce a spiritual state, including hallucinations, and is the medium to the spirit world from which supernatural knowledge and power are achieved. Animal 'spirit guides' are significant and the shaman can share power and visions with chosen friends or colleagues. Patients also take ayahuasca to join the spirit world during healing ceremonies. It is from this world that disease is believed to originate. An angered or vengeful spirit can strike someone ill, but bewitching shamans, or "brujo(a)s" (male or female witches) can also do great harm. During a traditional healing ceremony, chanting, rattle shaking, smoke blowing and the sucking on a part of the body is done, among other rituals, to remove illness. Illness is traditionally considered to take the form of a poison dart, which is sucked out by the shaman during the ceremony. Ayahuasca provides the power needed to find the nature and location of the disease. Although most people in the region are nominally Catholic, day to day religious/spiritual beliefs are a blend of catholicism and traditional beliefs. Various communities have a recognized and respected shaman, even more have curanderos (herbalists who use various plant remedies for treating complaints). Belief in brujo(a)s ('witches') is prevalent, with certain individuals reputed to be witches.

In recent years, shamans have drawn the attention of tourists, pharmaceutical interests, and medical researchers interested in their traditional knowledge. Some of the interest on the part of tourists has been in the hallucinogenic aspects of ayahuasca use, and ‘ayahuasca ceremonies’ are commonly available for a suitable price. This is potentially dangerous, as the ayahuasca preparation can be lethal if improperly prepared or administered, and there are many inexperienced people now offering such ceremonies.

Past shamanistic techniques of imaging, touch therapy, and faith healing, are changing to meet the competition of modern techniques. A greater use of herbs is apparently finding its way into more widespread application, and many shamans and/or curanderos have an extensive knowledge of herbal medicines. Modern medicines and sometimes other non-medical modern materials can also be used for curing. On occasion such ‘non-traditional’ treatments can result in severe damage, as in known cases of the use of cleaning fluid as a remedy for supposed kidney problems, or the use of a potent psychotropic drug to treat a common cold.

Despite the problems of integrating traditional healing methods with modern medical practices, it seems that there are many advantages to be gained by working with shamans and curanderos in remote rural communities. Many of the ‘cures’ provided by shamans and curanderos are effective, whether for medical or psychological reasons, and their knowledge of medicinal plants should be preserved and encouraged. Adding some pharmacy to their bag of tricks could enhance their standing in the community and improve the efficacy of local health promoters. Inexpensive and effective herbal cures could reduce the quantity and expense of pharmaceuticals needed for re-supply. Collaboration between traditional healers, health promoters, and more highly trained medical personnel could also help to eliminate the use of marginally effective, ineffective or dangerous treatments.

Traditional ‘Herbal’ Medicine

The use of herbs (as well as animal-derived items) in treating medical conditions is traditionally a layman healers art and something that relatively average people, both men and women, can become expert at. The use of herbal remedies does not have associated supernatural or spiritual aspects. Plants used in various traditional medications are commonly grown in home gardens, and most rural people are familiar with the reputed medical uses of a wide variety of native plants. Some introduced and ornamental plants have become integrated into the herbal repertoire over a short span of years, while many native plant species have probably been utilized for thousands of years. An intimate knowledge of the natural environment and its uses was the most sophisticated development of Amazonian Indian groups. This knowledge has been passed orally from generation to generation.

When Someone Gets Sick...

For many medical conditions, particularly when symptoms include a general ‘malaise’, the first recourse is usually herbal remedies prepared by a family member. A health promoter is not generally consulted unless it is very convenient to do so. If the condition persists, a shaman or health promoter may be consulted, but often the afflicted person just suffers with the condition, and following the path of least work or inconvenience appears to be fairly common. Generally, the ill reduce uncomfortable activity, wait to recover, and use treatments in the following order: home herbal cures, traditional medicine, health promoter medical treatment, then treatment at a clinic or larger center. Recourse to modern medical attention often comes late in the clinical picture when a medical condition becomes serious, and fear in the patient and/or family begins to build-up. Acquiring an accurate medical history under such circumstances can be difficult or impossible. Various reasons for some of the reluctance to seek modern medical treatment are discussed below.

There does not appear to be a clearly defined ‘role’ for the sick (i.e., stay in bed, take two aspirin, call the doctor in the morning, etc.). Those suffering from illness or injury behave according to how they feel, and may persist in activities

that aggravate or have the potential to aggravate the condition. Fatalism and complacency are often exhibited on the part of patients. Fatalism may be due to the belief that sickness is caused by spirits or sorcerers, and that there is little the victim can do to alleviate the condition.

Fatalism may also be exhibited in the attitudes of family members, who may not show concern or worry unless the patient is in grave condition. This is often seen in parents' complacency to the illnesses of babies and children, and children are routinely brought in for medical care with conditions far more developed than necessary. Children sometimes come for treatment unaccompanied. Such attitudes may be a reflection of times when infant and child mortality were considerably higher than they are at present, and when high mortality was expected.

Money and Medicine

Although most people readily make use of free medical and dental attention, spending money on medicine is generally avoided. This may be due to low cash flow in remote communities, and the need to save cash for 'necessary' items like clothing and tools, or even for desired luxuries. Belief in, or hope of an imminent recovery may also fuel a reluctance to part with scarce cash. This attitude toward money may be a reasonable response considering that much of the local economy is still conducted on a barter basis, with most immediate needs (shelter, food) obtained from the surrounding forests, rivers, and gardens. Medical care seems to be looked upon as a luxury of wealthy and fortunate people outside of rural communities.

Attitudes Towards, and Acceptance of Modern Medicine and Practices

Current medical culture is a vague combination of fears and beliefs from the past, persisting and joining with new beliefs about the use of modern medicine. Medical culture of the past was not a precise science, and depended largely upon the power of the healer, with knowledge of traditional cures passed on by word-of-mouth, or through a master-apprentice relationship. The diffuse nature of traditional remedies and cures may make it difficult for people to appreciate the need to follow precise directions and dosages when it comes to the application of modern medicines. Without constant supervision, appropriate and correct use of modern medicine by rural people is rare.

Care providers need to ensure that directions for the use of medications are clear and simple. When filling prescriptions, it is also important to consider how easy it may be for a patient to return to the clinic or health post to refill a prescription. Patients may not return if the health post is some distance from their home, or if they have to pay for transport. Following the entire regimen of treatment must be strongly stressed, as many patients stop taking medications once they begin to feel better, in order to save the remaining medicines for the next time that they feel ill. Extended regimens should not be given to long term therapy patients; they should be re-assessed periodically to evaluate their condition and adherence to the prescribed treatment. Ineffectual treatments, excessive side effects and the possibility of wasting large amounts of medicine are reasons to limit the use of medications that cannot be controlled and evaluated. The possibility of drug interactions (particularly with alcohol) should also be considered when prescribing medications. Injections are generally considered to be the most potent form of medication, followed by pills and/or topical creams. People are generally disappointed if they are not given some form of medication, and recommendations for preventative measures (such as drinking more water to prevent dehydration headaches) are not likely to be followed.

Most patients are willing to provide information for medical histories, although obtaining clear and accurate information can be difficult. Some repetition, very specific history taking and thorough examination are usually necessary. Communication barriers, and lack of understanding of the need for accurate medical histories complicate matters. It is necessary to frequently reemphasize that you are speaking about a particular patients medical history, as a shift of whose medical history is being recounted may occur without you being aware of it. For instance, when asking about the medical history of a baby or child that has been brought for medical attention, the mother may recount the

medical history of another child not actually present, or begin talking about her own symptoms. Cultural differences in priorities and interpretations complicate the taking of medical histories.

Patients of both sexes are willing to allow examinations with little problem of with embarrassment or shyness. Children may be frightened, however, and a lack of discipline can make control difficult. Some of the fear of children may be due to “disciplinary stories” recounted by older children or adults about “what the doctor will do to them”. Parents rarely or never interfere with examinations or treatments of children, and are not ‘over-protective’.

HEALTH PRACTICES AND CONSIDERATIONS IN RURAL AREAS

Personal Hygiene

Personal hygiene varies greatly, and is influenced by factors such as education, socioeconomic standing, physical condition/wellness and psychological status. Most rural people bathe twice daily – in the morning and evening. Although clothing worn by many rural people may appear ragged and stained, it is generally kept clean, with soiled clothing washed by hand, generally on the day on which it was soiled. Hands are not generally washed before eating, preparing food or after defecation unless grossly contaminated. Dental hygiene in rural areas is poor or non-existent, and restricted primarily to those with a higher level of education or higher socioeconomic status. People in urban areas have a higher awareness of, and overall standard of oral hygiene, in large part due to aesthetic reasons.

Sanitation and Waste Disposal

A recent Peruvian government program to improve sanitation in rural areas (1998-2000) resulted in the construction of tens of thousands of out-houses in the region. These were raised above ground level, with a drainpipe leading to a septic pit some distance away. The roofs were constructed to collect rainwater for washing and “flushing”. Unfortunately, there was no local education or collaboration with the effort and most of these structures have been converted to chicken coops and/or completely deteriorated. Probably less than 1% of them were ever used on a regular basis for their intended purpose. People frequently urinate off of dwelling platforms, particularly at night, and defecation is in any convenient spot back in the brush and woods behind dwellings. Latrine construction is virtually non-existent. A major problem with sanitation around dwellings is with pets and livestock, which roam and defecate freely. Heavy rains, along with human and animal activity mean that mud is a continual problem around dwellings, and high concentrations of parasitic nematodes, harmful bacteria, and other infectious agents are a chronic problem. Likewise, flood waters may cover the ground around and under dwellings at certain times of the year, further complicating sanitation problems.

Animal and vegetal wastes are typically discarded behind dwelling platforms where they are disposed of by dogs, pigs, fowl and vultures. Non-organic wastes are discarded wherever convenient, and there is no ethic regarding waste disposal in designated dumps. In more urban areas, river and stream banks are considered to be suitable locations for dumping all forms of waste. Larger urban areas with septic systems have no primary sewage treatment, but all raw sewage is pumped directly into nearby rivers. These bodies of water are, however, heavily used for bathing, washing clothing, cooking and drinking water by people living along the rivers.

Water Sources

In small communities, the nearest, cleanest, source of water is used for obtaining drinking and cooking water. This is either the river fronting the community or a stream that runs near the community. Some rainwater is also collected from roof runoff for the purposes of drinking and cooking. In the dry season, “clean” water sources may dry up, at which time water is obtained directly from the larger river fronting the community. If water is highly turbid, the silt is generally allowed to settle-out before drinking. Although government programs advocate boiling drinking water or

treating it with bleach, these practices are rare in most areas. People who working in fields and forest, or traveling by canoe do not usually carry water with them, but drink directly from the most convenient body of water.

Larger urban areas have water distribution systems, and some mid-sized communities have wells. Water in the distribution systems may or may not be treated, but even if treated, should not be considered safe to drink without further treatment due to leaks in the distribution system, and the high possibility of infiltration by contaminated ground water during periodic power outages. Cases of cholera occur in the region annually.

Food Handling and Preparation

No special considerations are given to food handling and preparation. Refrigeration is not available in rural areas, and is beyond the means of many people in urban areas. Meat and fish are generally cooked and eaten on the same day that they are obtained, or salted, dried, or smoked for later use or sale. Other prepared foods are distributed over the cooking platform, where the near-constant smoke from cooking fires may help keep insects away. Most foods are cooked, except for fruits. In urbanized areas, most people buy food in markets where there are no meaningful sanitation controls, and food items are openly displayed on a plastic sheet on a low table or on the ground.

Nutrition

Protein intake is a common problem in spite of the prevalence of fish in the diet. Chronic anemia from high parasite loads and repeated malarial infections complicates the nutritional needs of many. Red-meat is not often eaten in rural areas (except as wild game). Domestic livestock are typically sold in urban markets, and are not often consumed in rural areas. Dairy products are not used in rural areas, and eggs, beans and other non-meat protein sources are not commonly consumed.

Weaning usually occurs late in the first year or shortly after. Upper respiratory, gastroenterological and parasitic diseases increase markedly at this point. An intermediate marasmic-kwashiorkor state may be seen in some children as a greater dependence is put on yuca (manioc) in their diet. Yuca is largely devoid of protein and normal preparation removes many nutrients. Scurvy, pellagra, rickets, beri-beri, etc., are occasionally observed, but generally only as a mild condition.

Maternal Health, Family Planning, and STDs

There is no typical health consciousness with respect to pregnancy. Drinking soup, eating less rice, eating more fruit, smoking more cigarettes, drinking more beer and other known pregnancy idiosyncrasies are typical responses to keep the prospective mother as comfortable as possible. Family planning is gaining in popularity, with increasing numbers of women wanting birth control and family planning services. Aggressive government programs promote family planning and condom use (also as an AIDS prevention measure) in larger urban areas, and have caused some conflict with authorities from the Catholic church. Such programs are rarely or sporadically available in rural areas. Many women who seek access to birth control already have large families, and increasing levels of education and the cost of living in urban areas also contribute to the demand for family planning and birth control. Prostitution is legal, but registered prostitutes receive free monthly check-ups and regular AIDS exams at government clinics. AIDS, although present, is not common in the region.

Arthropod Borne Diseases

Most rural people utilize mosquito nets for sleeping, and government programs provide free mosquito nets to every family. People do not use nets during the evening dining and social period (6 to 8 PM), however, when malaria-carrying mosquitoes are most active. There is little awareness among people about mosquito life-cycles or control

measures, and potential mosquito breeding sites abound around most dwellings.

Control of other arthropod vectors is also difficult. Lice, bed-bugs, assassin-bugs, fleas, cockroaches, and other arthropods have a myriad of hiding places within a typical dwelling, and control and elimination of these vectors may be virtually impossible without recourse to large quantities of insecticides. Rigorous personal hygiene, and frequent washing of clothing and sleeping materials may be effective to a limited degree in the control of such pests. Keeping animals out of living areas would probably also help, although chickens may help keep populations of some pests under control

EPIDEMIOLOGY

Epidemic Diseases - Malaria

Malaria is common and widespread in the region, although certain areas have a higher incidence than others. Malaria also has the capability of undergoing an exponential increase in occurrence, as the following data from the Santa Clotilde Hospital on the upper Napo River illustrate. Malaria occurrence went from an average of one case per month in 1995, to thirty cases in January 1996, and about 180 cases in April 1996. Santa Clotilde serves approximately 1500 people locally and perhaps 4 times that many from near-by communities.

Malaria occurrence and epidemiology is complicated by lowered resistance due to parasitic anemia, repeated infections and nutrition problems. Re-infection average is seven times per person with as many as twelve re-infections in swampy areas infested with the *Anopheles* spp. mosquito vectors.

Over the past few years, there has been a low but constant occurrence of malaria in communities in the areas in which MEDCAP expeditions are operated. Malaria treatment is free in government clinics, but many infected persons will suffer with chills and fevers until the attack passes, or will wait for several days before traveling to a clinic for treatment. Afflicted persons often do not follow the full course of treatment, and reinfection is common. Approximately 80% of malarial infections are *Plasmodium falciparum* with the remaining 20% *P. vivax*. Some chloroquine resistance has been encountered in the region.

Epidemic Diseases – Dengue

Enough dengue occurs in the region to consider it when a presumed malaria case is encountered. Local people often confuse the signs and symptoms of the two. The chills and sometimes vomiting associated with malaria, and rash (sometimes diarrhea) with dengue help make the distinction. Dengue is more a disease of urban areas than of rural areas, however.

Disease Control Programs

Disease treatment and prevention programs - nutritional and iodine deficiency, infant vaccination, TB, malaria, cholera and other programs are being instituted by the Ministry of Health. The long-term effectiveness of these programs has yet to be determined (TB programs, for instance, need significant long-range professional management). Malaria research is in progress in the area, and a malaria rapid-response team targets outbreak areas. A malaria vaccine is undergoing development and testing in Colombia, and shows considerable promise.

FLORA OF MEDICAL AND DIETARY IMPORTANCE

Principle Crop Plants

Yuca (*Manihot esculenta*). Also known as ‘manioc’ or ‘cassava’, yuca is a root crop rich in starch, and is eaten cooked (can be substituted for potato), or roasted and grated into flour (‘farina’ or tapioca). Some varieties i.e., ‘yuca brava’ must be soaked or cooked to leach out or denature the cyanide content. Along with plantains, yuca is the principal starch source in the region, and the tubers can be harvested from the ground as needed. The local beer ‘masato’ is made by chewing and spitting the cooked tubers into a container to ferment, the amylase enzyme in saliva speeds the breakdown of the starch into sugars, hastening the fermentation process. Young leaves of yuca can be cooked and eaten as iron-rich greens, but are not considered to be a food item in contrast to other tropical areas of the world.

Plantain (*Musa spp.*). Locally called ‘platano’, plantains are also a significant source of starch food, with plants producing fruit year round. Green plantains are very starchy and eaten cooked or roasted. Ripe plantains are also cooked, but are softer and sweet.

Banana (*Musa spp.*). Closely related to plantains, but only eaten when ripe, not cooked.

Maize (*Zea mays*). The yellow hard corn is eaten as "sweet corn" when newly mature, when hard it is used for animal feed, for making flour, and also for making a (sometimes alcoholic) beverage known as ‘chicha’. ‘Chicha morada’, a popular sweet drink in towns is made from a purple variety of maize.

Rice (*Oryza sativa*). Two forms are grown. A dryland (upland) rice variety is grown intercropped with yuca and plantains the first year after clearing and burning new fields. Another variety is grown on exposed riverflats along the Amazon and Napo Rivers. Commercial quantities are grown in some locations such as the Yanashi area. When available, rice is commonly eaten with fish and other foods.

Plants Commonly Used in Traditional Remedies

Various plants commonly used for treating medical conditions are briefly listed below. A comprehensive listing of plant species and their uses can be found in the Amazonian Ethnobotanical Dictionary (1994) by JA Duke and R Vasquez, CRC Press, Boca Raton, FL (ISBN: 0-8493-3664-3).

- *Rosy periwinkle - cure for child leukemia
- *"Oje" (*Ficus insipida*) - intestinal helminthic parasites, leishmaniasis
- *"Pan de Arbol", Breadfruit (*Artocarpus altilis*) - sores, inflammation, hernias
- *"Renaquilla" (*Clusia rosea*) - fractures
- *"Ruda" (*Ruta graveolens*) - head ache, intestinal parasites, fever, colic, malaria, and dysmenorrhea
- *"Sanango" (*Tabernaemontana sananho*), arthritis, abscesses
- *"Suelda con suelda" better known locally as "Pishco isma", Mistletoe (*Phthirusa adunca*) - stomach ulcers, fractures, skin infections
- *"Ubos", Hogplum (*Spondias mombin*) - skin sores, vaginal antiseptic
- *"Una de Gato", Cat's claw (*Uncaria guianensis*) - snake bite, rheumatism, biliary colic, prosthetic inflammation, fever and cough
- *"Verbena" (*Verbena littoralis*) - bronchitis, stomach infections, ulcers, diabetes
- *"Yuhuar piripiri" (*Eleuthrine bulbosa*) - hemorrhages, dysentery, intestinal infections, snake bite
- *"Alo sacha" (*Mansoa alliacea*) - rheumatism
- *"Chiric sanango" (*Brunfelsia grandiflora*) - rheumatism, leishmaniasis "Uta"
- *"Chuchuhuasi" (*Maytenus macrocarpa*) - rheumatism, diarrhea, bronchitis, skin sores
- *"Guayaba" (*Psidium guajava*) - diarrhea, hemorrhages, eye pain, intestinal parasites, edema
- *"Guisador" (*Curcuma longa*) - malaria, hepatitis
- *"Limon" (*Citrus limon*) - throat ailments, nasal hemorrhages, skin sores, common colds,
- *"Malva" (*Malachra ruderalis*) - fever, cough, kidney tonic, anti-inflammatory, skin infections, stomach ache, eye irritations
- *Toronja and limon (citrus fruits) - said to prevent chicken cough

FAUNA OF MEDICAL AND DIETARY IMPORTANCE

Domestic Animals and Pets

A variety of domesticated animals are used for food production. The number of domestic animals owned by a household is generally small, but each household in a community will possess its own livestock. Most people own chickens and Muscovy ducks, and many people will possess swine. Cattle, water buffalo, turkeys, and a few other domesticated food animals are much less common. Pets may double as working animals in the case of the ubiquitous dogs (for hunting, guarding possessions) and the rarely encountered horse. Other pets are kept for utilitarian purposes (cats), or for entertainment value (parrots, parakeets, other birds, monkeys, etc.). Wild animal pets are usually obtained as babies and raised in the household. Such animals are generally free-roaming. Pets that become aggressive or dangerous when they reach adulthood end up in the stewpot.

Wild animals

Most wild animals large enough to justify the expense of a shotgun shell are considered to be food items. A few animals such as river dolphins are considered to be taboo, and snakes, vultures, herons, dogs, members of the cat family, and some other animals are not generally eaten, either due to taboos or offensive taste. The principal game animals that are eagerly sought include peccaries (wild pigs), deer, tapir, tortoises and turtles, guans and curassows (turkey-like birds), caiman, capybara and paca (large rodents), and all of the larger monkeys. Other animals that are hunted opportunistically include armadillo, coatimundi, anteater, otters and cats (the latter two for skins only), larger parrots and toucans, and smaller rodent species. Due to hunting pressure, large mammals, birds, and reptiles are very difficult to observe in most areas within a days travel of any community.

Biting and Stinging Arthropods

Most Amazon visitors are surprised to find that biting and stinging insects and other arthropods are much less prevalent than they expected. With appropriate preparation (wearing long pants, insect repellent, etc.) and avoidance of arthropod-rich areas, visitors can also greatly reduce the number of bites or stings that they receive. Many problems with insect bites are not due to the bite itself, but to secondary infection that results from scratching the irritated area – applying anti-histamine lotion or spray to the affected areas is advisable.

The most prevalent and annoying arthropods are in the insect families Diptera (flies, gnats, mosquitoes, etc.), and the Hymenoptera (wasps, bees, and ants.). Mosquitos (‘mosquitos’), black-flies (‘zancudos’) and no-seeums (‘mata-blancas’) are most active at dawn and dusk, and the latter two are encountered primarily along river edges. Use of insect repellent, and wearing long pants and long sleeves during the early morning and evening is the most effective protection. Use of mosquito nets while sleeping is essential unless the sleeping area is completely screened. Mosquitos are, of course, the arthropod vectors for malaria and yellow fever. Tabanid flies (‘horse flies’) of various species can be an annoyance, but do not generally transmit disease.

Hymenopteran stings are potentially dangerous to hyper-sensitive individuals, and such individuals should always have an anaphylactic shock kit with them. Ants are everywhere, and a number of species have painful stings. The inch-long *Paraponera clavata* ant (‘isula’) has a severely painful sting. Individuals vary in their response to the sting, but the affected area is generally painful for at least eight hours, and swelling may occur. Other ants with less painful stings include fire ants (*Solenopsis* spp.), trap-jaw ants (*Odontomachus* spp.) and the ‘tanganara’ ant, which inhabits a tree (*Triplaris* spp.) known locally by the same name. Local people generally avoid such ants by recognizing and avoiding the plants where they live. Wasps (‘avispas’) are common, but most species do not have a serious sting. Most stings

occur while walking through the forest when a nest on the underside of a large leaf is accidentally disturbed. Some large wasps (tarantula wasps) are reported to have extremely painful stings, but these wasps are rare and not aggressive toward humans. Sweat bees are commonly attracted to human sweat, and crawl on the skin or in hair; they are annoying, but cannot sting. Africanized or 'killer' bees are very rare in humid forested areas, and unlikely to be encountered.

Various arachnids pose potential health threats. Several species of scorpion ('alarcon') are frequently found in dwellings and can deliver a painful sting, with the small-clawed species generally having the more powerful sting. Most spiders are innocuous, however the wandering spider (*Phenutria* sp.) has a dangerous bite, and an antivenin to *Phenutria* bites is produced in Brazil. Tarantulas are common, but unlikely to bite unless handled. Irritating hairs on the abdomens of tarantulas may cause inflammation of the affected area. Ticks are present, but uncommon. Tiny 'seed ticks' may be difficult to remove, and embedded mouth parts that are not completely extracted can be a point of infection. Chiggers are common in grassy areas around human habitation, and infest areas of the body covered with constricting clothing (socks, belt-line, bra-straps, etc.), causing severe itching and inflammation. The chigger mite itself is so tiny as to be essentially invisible. Avoiding walking through grass and weeds is the best protection. Wearing gum-rubber boots or dusting the ankles/socks with sulfur powder is also effective. Hair and skin mites (scabies, etc.) are common.

Other Potentially Dangerous Animals

Snakes – Non-venomous snakes greatly outnumber venomous ones, but just about any snake that feels threatened will bite. It is advisable to leave all snakes strictly alone. The most dangerous venomous snake in the area is the fer-de-lance ('jergon') (*Bothrops atrox*), with large individuals reaching lengths of 7-8'. The fer-de-lance is an aggressive, well-camouflaged viper that commonly occurs around habitations, garden areas, on or along trails, and in and weedy or brushy areas. It is generally found on the ground, but does climb and swim quite well. Young fer-de-lance have a bright yellow tail-tip, and are considered by the local people to be a different species ('cascabel' - rattlesnake) from the adults. Many local people do not wear footwear while working in gardens or the forest, and most bites are on the feet or ankles. Without immediate administration of antivenin, severe tissue necrosis can occur. The bushmaster ('shushupe') is another large viper, but is rare, and occurs only in undisturbed forest where it feeds primarily on spiny rats. Bushmasters have very large venom glands, but are not aggressive, and likely to strike only if trod on. Some strikes are also warning strikes, with no venom injected. Due to the potential quantity of venom injected, however, a bushmaster bite should be considered to be immediately life-threatening. Other viper species are generally small and rarely encountered. Coral snakes ('corales', 'naka-naka') are quite common but secretive, and usually encountered only at night when they are more active. Coral snakes are non-aggressive, and most cases of coral snake bites occur when the snakes are being handled, but any bite should be considered life-threatening. Large constricting snakes such as the anaconda are potential threats if a very large individual is encountered. Such large individuals are extremely rare, though local people claim that 7-8 meter (~22-25') anacondas occur in some locations, and that such snakes occasionally pursue hunters and fishermen.

Fish – The fish with the worst reputation in western lore is the piranha. Local people in the Amazon do not worry about piranhas, however, swimming and bathing in locations where piranhas are known to be common. Most species of piranha feed on fish fins and scales as well as fruit. Only a few species eat whole fish or other prey. Red-bellied piranhas (*Pygocentrus nattereri*) are the most commonly encountered of these, and reach 6-8" in length. While many people have been bit by piranhas, bites almost invariably occur while removing piranhas from nets and hooks. Cases of swimmers or bathers being bitten are exceedingly rare.

People are much more afraid of fresh-water sting-rays ('rayas'). Sting-rays are not uncommon in sand and mud-bottomed areas along river banks, and have a spine on the tail that can deliver a very painful wound if a ray is inadvertently stepped on. Another despised fish is the candiru catfish ('canero'), of which there are several varieties.

One of the larger species is torpedo-shaped, and about 8” long. These are reported to occasionally take bites out of swimmers, and are a serious pest of fishermen, often boring into fish caught in nets or on trot-lines. Local people also abhor them since they scavenge drowned bodies. A smaller variety of candiru (about 2” by ¼”) is nearly transparent, and infamous as the “urethra catfish”. These catfish normally feed on the gill tissues of other fish, but on very rare occasions are known to swim into the urethra, rectum, or more frequently, the vagina. To prevent unpleasant encounters, it is recommended that protective undergarments are worn while bathing.

Mammals – Wild mammals pose few significant health threats. Vampire bats (‘vampiro’) are present, but are most common in areas with concentrations of livestock. The vampire is known to pierce exposed skin such as the elbow or big toe, with razor sharp teeth, while the victim sleeps, and exposed body parts, or those parts touching mosquito nets can be attacked. Vampires are known to occasionally carry rabies in other parts of their range, but actual cases of vampires attacking humans are quite rare. Other species of bats (‘murcielago’ = bat) are common, and some frequently roost in the eaves of houses. While bat feces may pose some health threats, this is probably offset by the quantity of insects consumed. Large cats such as the cougar or mountain lion (‘puma’ or ‘tigre’) and the jaguar (‘otorongo’) are present in many areas. Cougars are the most feared, as they are said to attack from the rear, and are often present in populated areas. Jaguars are not reported to be very dangerous, and shy away from human contact. Black panthers are a melanistic color form of the jaguar, and similar in behavior to the latter, though they are sometimes believed to be more aggressive and dangerous. Hunters may occasionally be treed by herds of white-lipped peccaries (wild pigs) which travel in groups of 50-200 individuals.

Diseases Transmissible from Animals to Man

Leishmaniasis – reservoir: rat, dog and 3 toed sloth, transmission agent: small biting flies

Chaga's disease – reservoir: opossum and rodents, transmission agent: assassin-bug

Brucellosis - infected milk

Trichinosis - infected pork

Cystercercosis - infected pork

Ancylostomata braziliensis - dog feces

Strongeloides stercoralis - monkey feces

Various fungal infections and helminthic infections from pet feces or vomit

APPENDIX A – General Customs

Peruvians, and in particular, people in the Amazon region are friendly and accommodating. Visiting medical personnel should not be worried that they will inadvertently give offense if they behave in the courteous and professional manner which they would use at home. While there are certainly cultural differences, “gringos” are expected to be different, or even a bit strange at times. Any inadvertent “offense” is mostly likely to be interpreted as unintentional, and due merely to the fact that the “offender” is gringo. Visiting medical persons should realize, however, that priorities and interpretations may be very different between local people and foreigners. This is most likely to be encountered while interviewing for the purpose of determining medical histories. Care should be taken not to ask leading questions, as peoples’ responses may be affected by what they think the interviewer wants to hear. Some notes on basic customs/practices of interest follow.

Eye Contact – as in “western” culture, with a few exceptions. Blank stares are common during history taking even if the question is asked in perfect Spanish. One reason for the apparent incomprehension could be the way the question is stated, i.e., a cultural difference in concepts or priorities. Children in remote communities are often shy and initially unwilling to make eye contact. This shyness is generally short-lived.

Attitudes toward Professionals, the Opposite Sex and the Elderly – Both male and female foreign visitors are accorded

a social standing somewhat different the “normal” male/female roles in the local society. Professionals are held in high esteem, and people are very cognizant of differences in educational and societal levels. In general, there is no problem in initiating contact with a person of the opposite sex. If approaching a mixed group, it is generally appropriate to greet and address the men first, starting with the older men, and then greet the women, although the reverse may be true if a “matriarch” is present. Men are leaders of households, although there is much more equality of sexes in the Peruvian Amazon than in other portions of Latin America where a certain amount of machismo may prevail. Visiting female health professionals are accorded the same respect as their male counterparts. The elderly are held in high respect, and it is appropriate to greet them when present to pay your respects. Likewise, “elderly” gringos are accorded deference. Overall, if you behave in a manner that would be considered to be courteous and respectful back home, it is unlikely that you will give unintentional offense to anyone.

Shaking Hands - Hand shaking is common, and it is normal to shake hands with everyone in a room or group upon entering. The western-style handshake is the most widely used, although the elderly and women may shake hands with the fingers straight, without grasping, and with the thumb pressed lightly on the backside of the opposing hand.

Drinking "Masato" - Friendly social visits often involve drinking the local brew, produced from manioc (yuca) tubers. The person offering the beer will often drink from your bowl before you do. This is a gesture of reassurance that the brew is safe and you are welcome there to drink (perhaps a hold-over from days when poison brew was a method of eliminating enemies tricked into coming over for a beer). Masato comes in all proofs, with lightly fermented masato considered a suitable drink for children. The alcohol content in mature masato probably kills most of the bacteria, but masato is something of an acquired taste, and not very popular among foreigners. If you are offered masato, drinking a little bit of it can be an interesting cross-cultural experience. If you would rather not imbibe, politely decline; no offense will be taken.

Giving Gifts - For various reasons, the giving of gifts should be limited, unless they are given in response to some specific consideration or service, or after a genuine friendship has developed over some period of time. Indiscriminate gift giving just because the giver has something that the receiver does not, creates the expectation on the part of people that gifts from visitors are their “due”, and may help create a welfare mentality. This is already evident in a few locations that are visited frequently by tourists. It is appropriate to receive small gifts from people in exchange for medical or other services rendered.

APPENDIX B – Immediate and Long-term Medcap Program Objectives

Immediate MEDCAP priorities are to ensure improved health in rural communities, to improve and increase health promoter participation in Medcap activities (on the job training, etc.), and to provide the necessary resources and information for treating common medical conditions in the communities visited.

Longer-term objectives include the following:

- *Ensure that communities have the necessary resources for caring for common medical problems.
- *Focus immediate health intervention on the concerns of the people.
- *Establish programs to promote increased health awareness, personal and community hygiene and sanitation, etc.
- *Investigate possibilities for program expansion and development.
- *Encourage reliance on effective traditional remedies, and help integrate modern and traditional medical practices.
- *Establish programs to increase the level of training and effectiveness of health promoters. Topics for further training will include the following:
 - *Normal and problematic child delivery
 - *First aid and wound care
 - *Nutrition - general, prenatal, neonate, vegetal supplements
 - *Disease transmission - oral-fecal, arthropod-borne, droplet,

- *Cooking, hygiene
- *Hygiene - personal, oral
- *Sanitation concepts
- *Anatomy and physiology
- *Signs and symptoms of dangerous diseases - respiratory, diarrhea, malaria,
- *TB, skin infections, etc.
- *Other diseases - EENT, UTI, Childhood, Feminine, STD, Skin
- *Concepts of antibiotic and drug therapy
- *Drug selection
- *When injections are and are not needed
- *Medicine dosing and administration
- *Monitoring patient recovery
- *Involving the community in disease prevention
- *Traditional medicine - cures of value, validation, recording

Changing behavior is a prime objective of the MEDCAP program. Gradual community support for ideas that involve behavioral change will evolve naturally in a community-based health improvement program. The participation of persons in other disciplines such as anthropology, ethnopharmacology, biology, education and community development will be critical.

APPENDIX C – Preparation for a Medcap Expedition

Proper preparation will help make your Medcap experience a positive and rewarding one. In most cases, common sense preparation will stand you in good stead.

Travel Documents and Legal Considerations:

Entering Peru is simple and straightforward. US, Canadian, and EEC citizens are required to have only a valid passport, no visa is necessary. Citizens of other countries should contact the nearest Peruvian embassy/consulate for requirements. Firearms and ammunition are forbidden for import, or to carry or convey to another person. Drug offenses are severely punished in Peru and all luggage is inspected and/or sniffed by drug dogs. If you are a US citizen, and need to apply for, or renew a passport, all the necessary information (including downloadable forms) is available from the National Passport Information System at <http://travel.state.gov>.

Trip Insurance:

It is recommended that you protect yourself and your equipment through the purchase of traveler's insurance. In case your Homeowners and Medical policies do not cover you abroad, purchase special travel coverage through a company such as Travel/Safe or American Express.

Money Exchange:

Money Exchange is easily taken care of in Iquitos. US dollars are widely accepted in Iquitos and other larger cities in Peru, and most stores/hotels will change dollars into Nuevo Sols (the Peruvian currency) at the official bank rate. **Bills should be unworn and free of tears, ink writing and other blemishes, or they may not be accepted.** There is no black market rate for dollars in Peru. Do not change dollars in the US prior to your departure as you will receive a poor exchange rate. For most people, US \$200-\$300 should be more than sufficient to cover the cost of souvenirs, bar tab, tips, and other incidental personal expenses incurred. Remember to budget for Peruvian airport departure taxes (\$5-6 for internal and \$30 for international flights). Credit cards are accepted at some stores, restaurants and hotels, and can be used at bank machines in Iquitos. **Traveler's checks can only be cashed at banks.**

Communications:

Once in Iquitos, you can easily phone or email back home. Many cybercafés are now open in Iquitos, including at least one 24-hour café. Computer time is 236 solis per hour (about \$1.00) and connection and download times are reasonable. To phone the US or Europe, the easiest and cheapest method is to use a payphone and have your contact call you back. Calling the US from Peru costs 3 solis per minute. Phone cards and calling cards do not work well in Iquitos. For phoning, put 4-5 solis (coins) in the pay phone at the hotel. Dial the country code (001 if you are calling the USA), then the area code, and the phone number. When your party picks up on the other end, you have enough time to say “hi”, and give them the pay phone or hotel phone number to call you back at. To call Iquitos from the USA, first dial 011-51-65, then the six- or seven-digit local phone number. The “51” is the Peru country code, “65” is the city code for Iquitos. There is limited phone service in areas outside of Iquitos, and no email access. Many US cell phones can now be used in Peru without the need for special chips.

Health Matters:

No vaccinations or preventative treatments are required of travelers between the US and Peru. We do recommend physical and dental check-ups for your convenience and continued good (preferably) health. Specialized medical attention may be difficult to secure in Peru, and will not be available in many remote river areas. Although no inoculations are required for entry into Peru, tetanus is recommended, and all travelers should consult with their physician regarding malaria prophylaxis, hepatitis vaccinations, and other health matters. Expenses for emergency medical care, evacuation or hospitalization are the responsibility of individual travelers.

The tropical sun is very intense and it is easy to burn or become dehydrated. Appropriate clothing and headwear, and high SPF sunblock are a necessity. Keep a water bottle with you at all times (and drink from it!).

A wealth of web-based health information about travel to tropical countries is available. Good sites to start with (which also have many links to other sites) are the **Travel Health Information Service** <http://www.travelhealth.com>, as well as the **CDC** site <http://www.cdc.gov/travel/> and the **Medical College of Wisconsin International Travelers Clinic** <http://www.intmed.mcw.edu/travel.html>.

What to Bring: A Generalized Packing List

- Personal toiletry articles and soap, shampoo, disposable razors, etc.
- Prescription medicines – sufficient to last the trip plus a few days.
- Malaria prophylaxis – remember, for this to be effective, you will need to begin taking the treatment prior to your trip, and continue treatment for a short period following your trip – consult your physician.
- Other travel medications such as Tylenol/Aspirin or similar, antihistamine lotion (for insect bites), antiseptic ointment (Neosporin or similar), Pepto-Bismol or other similar medication for upset stomach and diarrhea.
- Insect repellent (something with high DEET content). Citronella and other ‘natural’ insect repellents are largely ineffective in the Amazon. Sulfur powder is effective against chiggers.
- Flashlight (waterproof is best) with extra ‘D’ batteries and bulbs; D-cells are the battery commonly available in Peru, other sizes may not be available in many locations.
- Tennis shoes or other canvas-topped shoes which dry quickly, with rubber soles. These should be broken in already, you don’t want to get blisters on your Amazon trip! These are for wearing in town, on board your boat, or on the plane home. An old pair that you don’t plan on taking home can be useful for slogging through mud on forest trails.
- Hiking boots, jungle boots, or gum-rubber boots. Again, be sure these are well broken in! Be aware that if you are hiking on jungle trails, visiting villages, and having a real Amazon experience, your footwear will get wet and muddy. Gum-rubber boots (farmer boots, wellies, etc.), are popular with experienced jungle travelers, they are cheap (check with a good hardware store - \$15-\$25), easy to put on and take off (no muddy laces), dry quickly, and are easy to clean. They also provide good traction for slippery trails and excellent protection against snakes, insects and thorns, to say nothing of the rather unsanitary mud that can be encountered around villages. Be sure your footwear is comfortable, your feet are important, take care of them!

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- Binoculars. Invest in a good pair of lightweight binoculars. The better quality models are water resistant, if not waterproof. Your travel experience will be enhanced if you have the ability to examine birds, treetop flowers, dolphins, monkeys, and miscellaneous happenings along the route up close!
 - Photographic equipment and film, etc. Once again, don't stiff yourself. You will probably kick yourself if you don't have a good quality camera (that you know how to use...). Don't forget the back-up set of batteries. Bring plenty of film - it is expensive in Iquitos, and unavailable elsewhere.
 - Hat with wide brim or bill (essential for the tropical sun, useful also for rain).
 - Fannypack or small backpack, weather proof.
 - Light poncho or rain jacket (essential for trips in small boats). This can be supplemented with a collapsible umbrella for town.
 - Lightweight shorts and pants (avoid jeans and other items which are heavy and take a long time to dry).
 - Lightweight shirts, both long/short sleeves.
 - Underwear (loose is better) and socks – cotton are best for keeping you dry and comfortable. Wool socks are great for padding your feet if you bring gum-rubber boots.
- ***** (Laundry facilities are available in Iquitos)
- Lightweight jacket or windbreaker – in the dry season (northern summer), it can feel quite cool while traveling by boat at night.
 - High SPF sunscreen (SPF 15 or higher).
 - Polarized sunglasses – great for river travel, the glare off the surface of the water can be intense.
 - Trade items: popular items in the past have included D-cell batteries (in their original packaging – proves that they are 'fresh'), flashlights, T-shirts (universally acceptable!), children's and women's clothing, sheets, towels, candy, knives, scissors, toys, fish hooks and fishing line, bottles of aspirin, baseball caps, etc. Use your imagination! If you bring clothing, remember that most Peruvians are considerably smaller than the average North American.
 - Books in Spanish and various school supplies make a great donation to the poorly equipped schools of some of the remote villages that we visit.

OTHER CONSIDERATIONS

Persons with particular dietary or medical needs (vegetarian diet, diabetes, low-sodium diet, hypersensitivity, etc.), or with physical disabilities should notify us well ahead of time so that all possible arrangements can be made to accommodate your needs. We may not be able to make last-minute arrangements once you are in Peru.

Leave expensive and non-essential items (jewelry, watches, etc.) at home. Your trip will be enhanced if you take a few minutes to contemplate what you will need to be comfortable.

If you have questions, contact us by phone, mail, or e-mail. Answering questions validates our existence...