CHAPTER 6: EHC IN PRIMARY HEALTH CARE

RURAL EMERGENCY HEALTH CARE IN ALASKA

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INTRODUCTION

Alaska is the largest state in the United States, covering over 586,000 square mile, but it is one of the smallest in population with approximately 525,000 residents. Alaska also has more miles of coastline than the rest of the USA.

Planning for emergency health services in a large state with a sparse population like Alaska poses unique challenges. Medical resources tend to be limited, distances are great, response times are often long, communications can be a problem, and medical care providers have more difficulty obtaining continuing education and maintaining proficiency of skills.

Many of Alaska's villages and towns are not accessible by road. These communities are typically accessed by air or water. This means that, during wintry or stormy weather, many communities have no available ingress or egress for several hours, or even several days at a time. This can be a serious problem during health emergencies.

EMERGENCY HEALTH CARE PLANNING IN ALASKA

To plan for emergency health care in Alaska, the Emergency Medical Services (EMS) Section in the Department of Health and Social Services has worked with an Advisory Council, appointed by the Governor, to evaluate needs, to identify available local resources, and to establish standards appropriate for a variety of settings including small, isolated villages (Level I), subregional centers (Level II), regional centers (Level III), urban cities (Level IV) and rural highways. Levels I and II communities are further categorized into those with road access to a higher level community and those without.[3]

The State EMS office provides grants to Regional EMS Councils, Native Regional Health Corporations, and boroughs to hire EMS trainers and to plan and coordinate delivery of emergency health care services within each region, in accordance with the State EMS Planning Guide. Each year, the regional offices submit grant applications to the state identifying emergency health care problems and needs within their regions and listing program objectives for the following year.

LEVEL I COMMUNITIES

Level I communities are usually the smallest communities ranging in size from about 25 to 750 people. they may be predominantly Alaska Native villages (Eskimo, Indian, or Aleut), or non-Native villages, such as some remote fishing communities. The Native villages have Community Health Aides (CHA's) funded by the US Public Health Service to provide primary health care services. There are 157 villages and towns in Alaska with at least one CHA. In these communities, the goal of the Emergency Medical Services program is to supplement the CHAs' primary care training with emergency health care training, and to help equip them to effectively stabilize medical emergencies. The Alaska Area Native Health Service (US Public Health Service) and the State of Alaska both provide some funds for emergency health care training of Alaska Natives. The goal is to train all CHA's at least to the basic Emergency Medical Technician (EMT) level. In some areas, CHA's are trained to the EMT-II (EMT-Intermediate) level.

In predominantly non-Native level I villages, the regional EMS offices provide EMT training for local volunteers who may be the only health care providers within the village. EMT instructors can travel to remote communities to provide training, or health care providers from a number of towns and villages may travel to a regional center for training. Since the EMT-I course takes 2 to 3 weeks, it often is a burden on village residents to leave their families to get training in a regional center.

Statewide, there are 161 isolated Level I villages, and 57 Level 1 communities with road access to higher level communities.

LEVEL II COMMUNITIES

Level II Subregional Centers are usually somewhat larger communities, ranging in size from about 500 to 2,500 residents, which have a mid-level practitioner such as a physician's assistant, and clinic, or one or two physicians, but no hospital. The health care providers generally are paid by fees for service, with some local or state subsidies. Many of these subregional centers provide some services to surrounding villages, and most of them have at least one locally based air taxi service. In these communities, the EMS program has worked toward development of state certified volunteer ambulance and first responder squads, most of whom are trained to the basic EMT-I or the intermediate EMT-II level.

All EMT's certified above the EMT-I level (EMT-II's, EMT-III's, and EMT paramedics) must have a physician medical director, by state law, to legally practice their advanced skills.

The EMS program supplements the training of the local mid-level practitioners or physicians with such courses as Advanced Cardiac Life Support (ACLS), Advanced Trauma Life Support (ATLS), and Pediatric Advanced Life Support (PALS). The EMS program also provides aeromedical training to EMT's and other health care providers who routinely accompany patients in aircraft to regional health care facilities.

Another goal of the EMS program is to train EMT's in all Level II, III, and IV communities as rapid defibrillator technicians.

There are 17 isolated Level II communities, and 10 Level II communities with road access to Level III or IV communities.

LEVEL III COMMUNITIES

Level III communities range in size from about 1500 to 30,000 people, but have at least 3,000 people in the primary service area. By definition, regional centers (Level III communities) must have at least a small hospital. There are 17 Level III communities in Alaska of which 12 are not connected by road to higher level communities. In fact, most are not connected by road to any other communities. In these communities, the EMS program provides training and other assistance to local ambulance squads which usually have some full-time paid members and some volunteer members.

For these communities, the goals of the EMS program include: maintaining state certified ambulance services with certified EMT-Defibrillator Technicians, EMT-II's, EMT-III's (EMT-II's plus some advanced cardiac training) or paramedics. Special emergency health care courses in trauma, burns, pediatrics, Advanced Cardiac Life Support, and other special emergencies are offered to EMT's and paramedics, and to nurses and physicians staffing the local hospital emergency department.

LEVEL IV COMMUNITIES

There are only two Level IV urban centers in Alaska, Anchorage and Fairbanks, both connected to major highway systems which connect Alaska to Canada and the continental United States. Ambulance services in these communities are staffed with full-time, paid paramedics, and Anchorage is training its firefighter first responders (40 hours of training) as automated external defibrillator (AED) technicians. Anchorage has five paramedic units and twelve fire stations, so the goal is to provide rapid defibrillation to cardiac arrest victims in all areas of the municipality with firefighter defibrillator technicians while the paramedics are enroute to the scene.

Fairbanks has one civilian hospital, with 177 beds, serving all of interior Alaska (about 200,000 square miles) and one military hospital. The US Army base provides military helicopter ambulances for emergency care and transportation of injured and ill people in towns and villages within about a 150 mile radius of Fairbanks. For mass casualty incidents outside a 150 mile radius, these helicopters extend their range as refueling stops are provided.

The hospital in Fairbanks provides a full range of emergency health care services except open heart surgery and neurosurgery. This hospital meets the American College of Surgeons Level III trauma center criteria.

Anchorage has two private hospitals, one Native Health Service Hospital, and one military hospital. The two private hospitals provide almost a complete range of emergency health services including a Level III neonatal intensive care center, a burn unit, pediatric intensive care beds, cardiac surgery, a poison control center, and trauma care. One hospital has 238 beds and the other has 303 beds. The two private hospitals operate on a fee for service basis, and the native and military hospitals are funded by the US government. Anchorage hospitals receive referrals from health care facilities throughout Alaska, except facilities in southeast Alaska which refer most patients needing specialized services to Seattle, Washington which is about 600 miles south of Ketchikan, Alaska, or about 1500 miles south of Anchorage.

The native and private hospitals in Anchorage currently meet American College of Surgeons Level III trauma center criteria, but the goal for the EMS program is to upgrade at least one of the private hospitals to a Level II trauma center in the near future.

AEROMEDICAL SERVICES

The State EMS program also certifies aeromedical services, and has worked to help establish certified aeromedical services in all regions. Currently there are nine certified aeromedical services in Alaska, plus one in Seattle, Washington which serves southeast Alaska. Half of these services are medevac services, staffed primarily by EMTs and paramedics, and half are critical care air ambulance services staffed primarily by nurses and physicians. There is also one certified neonatal transport team based in Anchorage.

Prior to establishing state certification of aeromedical services, the State EMS office contracted for a comprehensive study of medevacs throughout the state.[4] This study, conducted in 1983, found that there were approximately 1500 prehospital Medevacs and 1500 inter-hospital aeromedical transports per year. The standard of care provided to patients transported by aircraft varied from sophisticated physician or critical care nursing care, to little or no patient care or stabilization during transport.

Following this study, the State EMS Office adopted aeromedical certification regulations which do not require dedicated air ambulance aircraft. Under these regulations, a team of certified or licensed EMTs, paramedics, nurses, or physicians, with 16 hours every two years of specialized aeromedical training, plus state approved equipment and a state approved aeromedical report form, and a physician medical director who also has at least 16 hours of aeromedical training every two years, can become a certified medevac team. If they don't own or lease dedicated aircraft, they can have written agreements with air taxi or air charter services in their areas, to provide aircraft appropriate for each mission.

For example, the medevac team in Nome may typically use a Cessna 402 twin engine plane for medevacs from surrounding villages, almost all of which have paved or gravel landing strips. But, when the runways are icy, a twin otter with reverse thrust to help stop the aircraft may be used, and if the villagers are at their fish camp, the medevac team may use a helicopter. This provides a cost-effective, flexible system to meet the needs of each mission. While not flying medevacs, the air taxi operators can use their planes for other purposes such as transporting passengers or cargo. Since there are so many aircraft in Alaska, there is almost always an aircraft available for an emergency medevac.

Sometimes, when a patient needs to be transported from remote rural or bush Alaska to a hospital referral center in Anchorage, one of the commercial jet airline companies may take out passenger seats to make room for a stretcher patient and medical attendant. Sometimes passengers are even asked to get off and wait until the next flight. For a stable patient not needing intensive care in flight, this is much less expensive than calling for a critical care air ambulance out of Anchorage.

Most critical care air ambulances do maintain dedicated fixed wing aircraft and dedicated, full-time crews. One private hospital in Anchorage also has a dedicated aeromedical helicopter based at the hospital, and the other private hospital in Anchorage is adjacent to an airport, so fixed wing air ambulances and medevac planes can deliver patients literally to the door of the hospital emergency department.

The goal of the EMS program is to help establish at least six more certified medevac services to provide better coverage to all regions of the state.

RURAL HIGHWAYS

To provide good coverage with reasonable response times for emergency health care services along Alaska's rural highways, the state EMS Office has studied motor vehicle crashes per 10 mile segments of the highway system.[5] This has helped identify high hazard areas for priority attention. The EMS program then studied the locations of existing ambulance services and looked at possible locations to establish new ambulance squads or first responder squads. Extensive training and funding for capital equipment was then provided and several new volunteer EMT squads were established. Between 1973 and 1988, the number of organized ambulance services in Alaska increased one hundred fifty percent, from 35 civilian services in 1978 to 86 civilian services in 1988. The EMS program also has put a major emphasis on trauma training for EMTs and paramedics, and has upgraded most EMTs along rural highways to the EMT-II or EMT-III levels. Also, a $2,500 state mini-grant is provided each year to ambulance services staffed mostly or completely by volunteers. Efforts also have been made to increase fees for service for ambulance services to help pay for more training and equipment. In cities and towns, most ambulance services also receive a local government subsidy.

EMS COMMUNICATIONS

A major problem for emergency health care delivery in many areas is radio or telephone communications with hospital referral centers. In rural Alaska, virtually every Level I community has a small earth satellite station for telephone communications. These earth stations were funded by the state of Alaska in the mid-197Os, at a cost of about $50,000 for each village. Community health aides use these telephone communications to confer with physicians in regional hospitals.

In cities and towns with ambulance services, all ambulances are equipped with radios to communicate with local mid-level practitioner clinics, physicians or hospitals. However, especially along rural highways, there are numerous radio dead spots and very few telephones. Therefore, another goal of the EMS program has been to obtain funding to extend EMS radio communications systems along all major rural highways, and to install emergency call boxes so motorists can quickly report car crashes or other health emergencies. In some local areas, such as Prince of Wales Island in southeast Alaska, EMTs have been given permission to use existing radio networks, such as the US Forest Service radio system during health emergencies.

EMERGENCY HEALTH CARE SYSTEM IMPACTS

Proving that developing better emergency health care services saves lives or reduces disability is often a very difficult research problem. However, Alaska vital statistics show that from 1978 to 1985, the death rate from traumatic injuries in Alaska was reduced by thirty percent.[6] It is reasonable to assume that some of this reduction was the result of improvements in the emergency health care system.

Within the past year, a pilot trauma register project was initiated involving seven hospitals in south central Alaska. The goal of this project is to collect data on prehospital response times and treatment and in-hospital response times and treatment of all trauma patients who were admitted to the hospital, transferred to another hospital, or declared dead in an emergency department. This data can be used to evaluate the quality of trauma care and the emergency health care system, and to determine the impact of injury prevention programs. The goal is to expand this trauma register to all hospitals in Alaska.

SUMMARY AND CONCLUSIONS

Using available resources, such as native health service trained and funded community health aides, local air taxi services or commercial airlines, volunteer citizens,

local telephone or radio networks, and a variety of funding sources, the state of Alaska has developed a comprehensive, statewide emergency health care system, serving the needs of all citizens and visitors, which are cost-effective and appropriate for the size and location of each community. Today every village and town in Alaska has trained and equipped emergency health care providers, and ground or air ambulance transportation is readily available (except in bad weather) to transport patients to regional or urban hospitals.

The levels of community planning approach may also be appropriate for emergency health care planners in other areas.

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TRADITIONAL MEDICINE IN HEALTH EMERGENCIES

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INTRODUCTION

Although most natural calamities such as earthquake, hurricane, flood, etc. can be equally devastating to the developing as well as the developed countries, most of the health problems which present themselves as emergencies in the later case are often associated with hi-tech products like cars, airplanes and other motorized or electrically operating gadgets. Does this mean that people in the developing nations rarely confront health hazards worthy of consideration as emergencies? For the unwary person the answer could be yes, for the very fact that over 70% of the population in these countries are subsistence farmers with barely sufficient income to feed themselves let alone to benefit from scientific and technological products which as we have said earlier are the major causes of health emergencies.

This argument, however, fails to consider other serious and innumerable factors that are associated with underdevelopment that lead to health emergencies and the capacity or lack thereof in containing them. A spark of fire may not pose a life threatening situation in the West, but it can be devastating in the Third World where over-crowded villages and shanty towns are commonplace and where there are only about a few hundred fire fighting trucks for every one million population or more. The technological products that are present in these countries although insignificant compared to those found in the West cause as many injuries if not more. Because of the high social, technological and economic standing, people in the West are better equipped to prevent and to bring under control isolated or wide scale emergencies.

On the other end of the spectrum, in Third World countries with extremely poor infrastructure and low levels of social consciousness, epidemic diseases and injuries deserve serious attention as medical emergencies, but they are seldom acted upon before they wipe out an entire village, or before they debilitate significant numbers of people.

As a measure of prevention and control of injuries and other health emergencies, developing countries like Ethiopia have to extend and strengthen primary health care programs by more effectively utilizing their local material and manpower resources. As it now stands, no one else is better suited for this job than the traditional medical practitioners including the traditional birth attendants, herbalists, bone setters and faith healers - all of whom have justified their existence by trying to fill in the enormous gap in the handling of injuries and other health emergencies despite all the attempts to discount their contribution until very recently.

TRADITIONAL MEDICINE: COMPARING ITS ACCESSIBILITY WITH MODERN MEDICINE AND ITS POTENTIAL ROLE IN VITALIZING PRIMARY HEALTH CARE COVERAGE

Before going into the discussion of the possible contribution of traditional medicine to primary health care development in general and its potential in prevention and control of health emergencies in particular, it seems reasonable to give a bird's eye view of the status of modern health services with emphasis on the situation in Ethiopia.

Despite the continued effort to optimize health coverage since the late nineteenth century, access to organized medicine in Ethiopia has still remained far less than satisfactory. For example, if we take the available health manpower as a yard stick to measure health care coverage, we see that doctor to population ratios are

1:3,603 and 1:71,392 for urban and rural areas respectively. These ratios are not based on Ethiopian physicians alone but include expatriates who comprise 38.7% of the total. When compared to the developed countries like the Federal Republic of Germany and the United States where the ratio is 1:300 and 1:520 respectively, it is not difficult to realize the extent of the accessibility of modern medicine. It is almost the same picture if we compare the ratio of nurses and health assistants to the population which is 1:21,000 and 1:5,250 respectively. When the health professionals, mainly doctors, nurses and health assistants are considered as a single resource pool, the country has 19 for every 100,000 population while the developed nations like Canada have as many as 750 for every 100,000.

Paucity of health professionals is not the only problem. Many health workers provide their services in hospitals by treating diseases which are complex and relatively less common and which are largely less important when we consider the major causes that lead to morbidity and mortality among the rural population. For the work they perform in the rural health centers, they appear to be under-utilized relative to the diagnostic equipment available to them and the drugs they prescribe.

Most health workers lack interest in working in the rural areas (40% of the medical doctors and 65% of the specialists are based in three of the major cities that have only 4.4% of the total population), and many abandon medicine for a career in politics or some other field. Although seemingly minor, the brain drain whose root causes are lack of incentive or acceptable pathways to professional development and political instability, contribes to the apparently poor health care coverage.

The widespread insufficiency of modern health care services is exacerbated by a periodic shift in priority of national budget allocation and by the small government health expenditure that has not only progressively decreased form 4.4% in 1984 to 3.8% in 1987, but also by its skewed nature in favor of the three urban centers, Addis Ababa, Asmara and Harar-Dire Dawa, which consume 43% of the total national health budget at the expense of the rural hinterland.

The continued economic decline makes the picture gloomy for achieving health care coverage, as exemplified by:

1. The growth rate of the agricultural sector has fallen from 2.2% in the 1960's to below 1% during 1970 to 1982;
2. Rising debt service payment which increased from 8.8% in 1973 to 40% in 1989; and
3. A booming population growth which according to demographic experts could increase as much as seven times before it stabilizes (more than that of the present day US population).

With such far less than satisfactory modern health services availability to the Ethiopian population and with bleak prospects of its expansion in the future, the population will no doubt continue to rely on the alternative, traditional health care delivery system as they have always done since time immemorial. It is accessible, acceptable and affordable. We will attempt to show how far this is true by pointing out some facts about the components of this system, ie. the traditional medical practitioners and the drugs involved.

TRADITIONAL MEDICAL PRACTITIONERS

The traditional medical practitioners (TMPs) in Ethiopia as elsewhere in many parts of Africa constitute an enormous manpower reserve. Our projected estimate based on the 10,000 listed so far shows that there are over 25,000 of them. In terms of healer-to-population ratio means one to every two thousand. Not only are they numerous, but they are also a permanent part of village life and share everyday activities. Additionally, they are providing routine health care, treating injuries, and responding to other emergencies.

The devotion to their profession coupled with the ample time they have for their patients has earned them the status of spiritual leadership among their respective communities.

These are the major factors why we think that the TMPs can significantly change the health status of the remote villages in virtually all parts of Africa. A case in point would be the traditional birth attendants (TBAs). No one else has inflicted more harm on mothers and children than the untrained TBAs in the traditional health care system. Although statistics are scant, following training in maternal and child health has resulted to a great extent in the reduction of maternal and infant morbidity and mortality rates. It is therefore, time to rethink the other traditional medical practitioners (TMPs), including bone setters, and utilize their services by equipping them with basic information on prevention and control of emergencies and other health concepts.

Although belatedly, the attitudes of the health planners and governments in Africa are now changing towards the TMPs. It is also encouraging to see the establishment of professional associations and related activities. Our Department in the Ministry of Health has recognized that these people can contribute to the expansion of the health care coverage and therefore has developed health education programs mainly in prevention of diseases and management of epidemic training, in despite of the financial constraints we have. The receptiveness of the practitioners to the program is remarkable, so much so that our anticipation of facing resistance was absolutely wrong. The training is as much as passing on what we know, as it is learning from them the wisdom of healing.

Organizing the TMPs in associations is believed to provide the means of increasing the quality and quantity of services they have been providing to the community. After reviewing the existing codes and proclamations, we have drawn up a policy document that we will apply to the association of the practitioners.

Many of the activities we have been pursuing in the department, although primarily directed towards extending basic health care coverage by more effectively exploiting local material and manpower resources rooted in traditional medicine, can also be regarded as an endeavor to save our heritage. This is a heritage that has mellowed and crystalized over centuries or even millennia. It is a heritage to which most of the population still resort to find solutions for their physical and mental problems. However, as we all know, it is a heritage mostly based on oral tradition that is transmitted by word of mouth from generation to generation. As well as many other useful traditions that are now gone into oblivion, this traditional means of health care in part or as a whole is now facing a danger of being irretrievably lost. This is not due to the gradual process of being replaced by the expanding conventional health care delivery system.

The havoc this health care system is facing stems from the recurrent drought, protracted civil strife, resettlement programs, migration from the rural to urban centers, etc., most of which present themselves not only as serious obstacles to the expansion of modern health care services but also abruptly sever the social and family ties that are imperative for information flow of oral traditions in general and traditional medicine in particular.

The disappearance of this health care system, is a serious cause for concern since this situation is not counter-acted by simultaneous expansion of modern health services. Additionally, this system is valued for its antiquity as well as its current role in the fight against diseases. Unless sustained effort is made, we will loose the past health status of easily available, cost effective traditional medical services especially for the rural populations. Therefore, nothing else could be more appropriate than the development of traditional medicine to meet primary health care needs. By doing so, it will save their heritage, improve their well-being, and help the future of humanity. As part of the emergency health care development program, the promulgation of favorable policies by the governments of the developing nations remain to be of the utmost importance for the initiation or advancement of this important health care delivery system.

THERAPEUTIC AGENTS IN TRADITIONAL MEDICINE

Drugs used in this system are prepared from plants, minerals, and animal products that are often within easy reach and are usually provided free of charge to the patient or are to be paid according to one's financial capacity. The bills are either settled in a form of manual labor, exchange of objects like grain and sheep, or paid in currency immediately after full recovery or later at a more convenient time. The patient therefore is not confronted with the choice of receiving or not receiving a treatment just for being unable to pay the admission or prescription charges as it is often the case in modern medicine. The inaccessibility of modern medicine resulting from high product costs coupled with shortages and or lack of transportation facilities, the long waiting list, etc. are all less than encouraging factors to seek medical assistance even from those health institutions which may be considered geographically accessible.

Traditional medicine is also acceptable to the people because it is an integral part of the local culture, ie. beliefs, life styles and attitudes. Drugs in this system conform to the idiosyncrasies of traditional society, while modern sugar coated or tasteless tiny tablets with their insidious actions are regarded with skepticism.

Even though some traditional remedies work through their placebo effect (which is also a positive aspect), it would nevertheless be wrong to reduce their presumed efficacy in the treatment of diseases and injuries to simple reason, trust or psychological acceptance by the user. On the contrary, real and consistent pharmacological action has been proved against common diseases peculiar to specific region through repeated observation over centuries of use.

It is hence worth all the effort to look into the matter positively and to scientifically promote the useful remedies and practices not only as response to the stagnant or even declining health care coverage that is based on the official system but also as a gesture of respect to people's culture.

Although many countries in Africa agree on this point, they have been unable to draw suitable research approaches vis-a-vis their available resources and skilled manpower. In fact, the situation has been one of utter confusion, in recognizing the importance of incorporating traditional therapeutic drugs into the main stream of the conventional system. Multinational pharmaceutical firms first require rigorous evaluation along the lines of classical research. However, given the economic and technological status of most developing countries, this option is extremely difficult if not impossible and therefore we will attempt to show the kind of alternative research approach that these nations ought to adopt to scientifically promote traditional remedies or more specifically phytotherapy which is by far the most important compared to magico-religious healing and certain techniques like bone setting or traditional mid-wifery.

As the name implies, phytotherapy is treatment with plant-derived remedies. As we all know, plants have always been a common source of medication either in the form of traditional preparations, as semi-processed

products or as pure active principles. In the traditional health care delivery system of Ethiopia, it is estimated that there are over 700 plant species utilized by 80% of the population in the cure, prevention and rehabilitation of over 200 types of health problems including several physical injuries. Many of these could no doubt have the reputed efficacy since substantial numbers of very closely related plants are employed for similar or identical conditions by people who live in different geographic regions and with different socio-cultural settings. Undoubtedly, some others might not have consistent therapeutic value, and a few might have undesirable side effects. However, none of these are peculiar to traditional medicine. Modern medicine too has its dark sides. Drugs deemed effective today may be found worthless or even detrimental with the passing of time. A case in point in this respect is the haunting experience of thalidomide which crippled over 10,000 children.

Real adverse results in traditional medicine stem from lack of precision in dosage and an imprecise nature of diagnosis (especially of chronic and complicated conditions), both of which can be rectified through rigorous quality control and standardization of dosage, and through health education programs specifically designed for the traditional medical practitioners to make them aware of the limits of their skills.

In countries like Ethiopia where diarrheal diseases and helminthiasis constitute the first or second causes of outpatient visits, and where mild and self-limiting illnesses such as bacterial infection are extremely common, simple, easily available and cheap traditional remedies could be used to a great advantage. These conditions which do not require sophisticated diagnostic aids and treatment can be directly related to symptoms. Additionally, it is anticipated that the traditional drugs will show a high degree of consistency in their efficacy because of repeated usage over considerable periods of time. A conscious promotive effort is, therefore, imperative to assess the therapeutic claims of the locally available material resources. If restructured as part of a carefully planned strategy of a self-reliant development program, evaluated traditional drugs could appreciably contribute towards meeting national primary health care requirements.

Nothing else would be a more rational health development approach than this in view of the acute shortage of drugs, low per capita drug budget, inequitable distribution in hospital services, poor management, and misappropriation of funds. Traditional medicine is not only cost effective for wider application but is also socially and psychologically beneficial.

The choice now is either to depend on everything imported as finished products or raw materials, or to minimize the dependency by developing the traditional forms of remedies following the example of China and many other countries in Asia. It must be understood, however, as one of the poorest nations we are often acutely short of hard currency to import even the most essential drugs whose prices increase every year if not every day.

For example, the price of anti-infective drugs rose from US$ 1.5 million in 1985 to US$ 3 million in 1987; dermatological agents similarly increased from about a quarter of a million in 1985 to over US$ 1.4 million in 1987; respiratory drugs and GIT drugs have similarly increased while the overall economy of the country showed no parallel growth for the period mentioned.

The constant increase in drug prices is just one side of the problem. The other sides are, foreign dependency, imposition, the long delivery time, prolonged delay in harbors, and uncontrolled temperatures during transportation.

It is not therefore, a luxury but rather a necessity to scientifically verify the local medical resources with the aim of replacing or supplementing many of the pharmaceutical preparations for use in the official health care system.

The obvious question that crops up is, in what form do we plan to use the remedies from traditional preparations in the official health care delivery system? Should we formulate pharmaceutical preparations based on isolated active principles?

An examination of the patterns of drug development from plants and its technological requirement for production indicate that developing countries and least of all countries like Ethiopia and others in Africa are not generally in a position to identify and isolate active principles for formulating new drugs.

Even if this is possible, the cost of production would be too high, rendering the products very expensive for the majority of the population whose very problem of drug shortages we want to alleviate. Once more, let us assume that we have or may have the technological capacity and expertise to prepare drugs of plant origin based on isolated active principles. How long, then would it take to produce a single marketable drug? Everything being equal, it is estimated conservatively that a minimum of ten years is required to manufacture new pharmaceutical preparation and to make it available to the consumers. Let's again assume it is easy to isolate and characterize the active principles, but would they have the expected efficacy and safety level after all the huge capital investment and human effort? Our suspicion is based on the fact that a plant species which is employed as medicinal agent constitutes hundreds of chemicals which act synergetically or antagonistically to produce the desired therapeutic action and then the isolation of one or a few number of active principles from this pool may render the compounds valueless or too toxic to use as such, although in the long run they could serve as templates for synthetic agents.

If we are to palliate chronic drug shortages and meet the pressing target date, "Health for all by the year 2000",

we have an urgent task, especially in view of the scarcity of resources, shortage of highly skilled scientific manpower, length of time it takes to isolate active principles, uncertainties of efficacy, and finding appropriate research methods.

It is important to realize that it will take more than just the formal Western based system of medical care providers to extend the health coverage to an entire population by the end of the century. The magnitude of this goal which aims to satisfy basic human needs by mobilizing all available natural and manpower resources demands a policy decision by the governments of the developing countries to utilize at the PHC level the various forms of safe and effective extracts from:

1. Most widely used plants in the treatment of locally common diseases and injuries;
2. Plants that are used as medicine as well as food sources; and
3. Plants which already have established safety and efficacy records.

The basic steps we have identified for the kind of research envisaged for development of drugs from the traditional remedies are:

1. In vitro and in vivo efficacy tests of the various extracts;
2. Acute and subacute toxicity studies of the extracts in two animal species;
3. A modified shorter toxicity study since the drug has been in use by humans for several generations; and
4. Clinical evaluation for efficacy.

These screening methods or rather an alternative research method reinforced with information from published works is the most viable option available to the developing world since as we said earlier the cost of isolating and formulating drugs from active principles requires the transfer of high technology. The acquisition of which is extremely difficult in view of the unbearable prices and the potential competition for marketing of the new drug with the existing pharmaceutical products from the developed nations.

The extracts which are evaluated in light of the above alternative research method are not only cheap but also possess a high degree of reliability in efficacy in tackling diseases of infectious origin that afflict the majority of the population in countries like Ethiopia. They are not inferior to conventional drugs, as they are accepted in many cases in modern therapeutics. At times in fact they are preferable to the modern ones because they have no long lasting side effects and they show increased solubility and bio-availability.

One possible question that might be raised is, would it pose ethical problems to give the drugs thus prepared to humans? Although it is vital to have supportive government policy on the use of these preparation, we believe the alternative approach is in no way in contradiction with medical ethics since it aims to alleviate human misery by employing improved remedies from the traditional medical system which is still being used by 80% of the population and which has been in existence for centuries or even millennia. What is unethical in our view, would be the failure to diversify the medical resources in the face of ever impoverished health services for lack of modern drugs.

The alternative research approach is not only a means to produce substantial numbers of scientifically sound preparations from the folklore health care delivery system, but it is a new way to cultural awareness reaffirming the pride in national values. This approach is also the basis for future capacity building in biomedical and pharmaceutical research, because we believe that while still making use of the safe and effective extracts in PHC, the isolation of active principles and the formulation of new more cost effective drugs will meet the requirements of international consumption.

Although alternative research methods in traditional remedies is far more economical compared to the classical approach, there is no doubt that it will be very difficult for the Third World countries to find resources to initiate the work. Therefore, we strongly feel that it is the duty and responsibility of those involved in emergency health care development not only to encourage the developing countries to develop and use their local materials locked up in the traditional health care system, but also to help them find the resources required to perform research.

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RURAL EMERGENCY HEALTH CARE: ASSESSING AND RESPONDING TO THE SPECIAL CONCERNS OF RURAL POPULATIONS

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Perhaps the best way to define "rural" is by saying that it is neither urban nor suburban. It is many things that speak to small towns and villages, including population sparsity, single family dwellings, agrarian economies, wide open spaces, frontier areas, wilderness, and the list goes on. I've yet to come across a definition that covers the diversity of life styles and mind sets that somehow are all "rural" in nature. This session will briefly summarize the unique characteristics, problems and challenges of rural emergency health care systems and then highlight three distinct programs in the United States which have been specifically developed to meet the emergency health care training requirements of unique rural populations.

From the perspective of primary health care delivery, rural areas typically have fewer resources whether they are professional manpower, facilities or services. In the United States small hospitals (those of less than 50 beds) have had a difficult time remaining financially viable during the past two decades. Many small towns no longer have an inpatient facility, and thus, residents must travel to the next larger community for secondary care. This loss of hospital facilities will also impact on the communities' ability to retain or recruit primary care physicians. The problems of professional isolation and lack of hospital based income have been well documented.

The reduction in primary and secondary care puts additional stress and perhaps importance on the existence of emergency medical care and transportation within rural areas. It also means that often rural populations are more acutely ill because they have not had easy and routine access to preventive and early intervention services. Epidemiologic studies also show us that rural populations have a higher incidence of traumatic injuries than their suburban and urban counterparts. The severity of rural trauma also tends to be higher. For example, in my home state of New Mexico, 70% of highway crashes take place in urban areas; however, 70% of all fatal crashes take place in rural areas.

"Rural" also means that people live further apart and that the distances between homes, businesses and services are greater. This increases the initial response times of emergency responders as well as the transport time to definitive care compared to more urban areas. Because there is usually a small population in a large service area, it is difficult for communities to support full time, paid emergency responders. Rural areas are most frequently served by volunteer emergency medical services, which also contributes to longer response times. Again, in New Mexico about 70% of the population is served by paid responders covering about 10% of the geographic area. The other 30% (generally communities of less than 5,000) are served by volunteers and are responsible for covering 90% of our vast, high plains and mountainous terrain.

In addition to these issues, the delivery of emergency care is made more difficult by the relatively small number of cases and opportunities to practice skills. Training and retraining takes on a special importance when individuals may be called upon to provide life saving care only several times a year. Medical supervision is also a difficult challenge in rural areas. Primary care physicians are often not well prepared to provide supervision to rural EMS squads, nor are they always reimbursed for this use of their professional time.

In the past 18 months there has been a resurgence of interest and concern about the variable status of rural emergency medical services in the United States. The National Rural Health Association appointed a task force to assess the problems and propose solutions. This activity included a national survey of rural providers and a working conference to reach consensus on the issues. The major problems uncovered were in the areas of training, communications, systems development, medical supervision, finance, and personnel (recruitment and retention). A summary of the preliminary findings was published in the June, 1989 JEMS. In the Spring of 1989 the federal Office of Technology Assessment commissioned several papers on rural EMS and will be publishing the results of their study in several months. Finally, a bill was introduced into the US House of Representatives, HR 1587 - the Rural EMS Act, which proposes to provide additional funds for operations and research and demonstration projects specific to improving rural EMS throughout the country.

Thus, interest is high and the need is acute. There are many successful models that we can all learn from and replicate to better serve rural communities.

EMERGENCY MEDICAL CARE IN A SENIOR-LADEN SOCIETY

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The percentage of aged people in each country is expected to increase in the future. In Japan, however, it is predicted that the percentage of aged people has been increasing more rapidly than in any other country. This is because the span of life of the Japanese is increasing, and as a result, the Japanese tend to marry later and have fewer children. Furthermore, we expect this trend to continue for many years.

Although the population ratio of the aged group over 65 was 10.9% in 1987, it is predicted that this group will occupy about 23.6% of the population by 2021. In short, the number of aged people will more than double in only 30 years. Moreover, the percentage of the "very old" people, those exceeding 75 who are not in the best of health and require special care, are expected to undergo a greater increase than the relatively healthy people in the early years of old age. In view of this phenomenon, in order to get a better understanding of the emergency health care problems of senior citizens, we undertook a study over the past eight years by analyzing the data from 865 elderly patients over 65 who were brought to the Senri Critical Care Medical Center. This center is a tertiary emergency medical facility and is open to the selected serious or severe emergency cases. Elderly patients in the Senri Critical Care medical Center amounted to a 16.4% share of all patients. There were also 202 very old patients over 80, amounting to a 3.8% share of all the patients at the clinic.

We classified all patients into three groups according to their age; under 65, over 65 and over 80. Aged patients over 80 have been increasing more and more. A four fold increase in patients over 80 has been seen in the past eight years. This ratio is markedly greater than the corresponding ratio in the Japanese population. This was also the same with patients over 65. This phenomenon indicates that aged patients will be a main theme in emergency care in the future.

In the younger group, traumatic patients took about half the entire share, and digestive system diseases had the second highest share. Contrary to these findings, the aged patients were mainly suffering from diseases of the cerebrovascular (22.0%), cardiovascular (18.1%), digestive (17.6%), respiratory (7.1%) and urinary tract (5.6%). The percentage of traumatic patients in the over 65 age group was only 18.5%. Those patients in the very old age group were mostly found to be suffering from diseases of the cardiovascular system (20.8%).

Patients had an average of 2.7 accompanying disorders on arrival. Patients who did not suffer any accompanying disorders on arrival were only in the ratio one in ten. The main accompanying disorders observed were diseases of the digestive system, hypertension, operation history and diseases of cardiovascular system and respiratory system.

With regard to the incidence of organ failure, 22.8% of aged patients suffered organ failure, while the figures for younger patients amounted to 8.2%. Furthermore, 11.4% of aged patients suffered multiple system organ failure, while this was seen only in 2.9% of younger patients.

After classifying all patients into three groups, younger patients under 65 (group A), older patients over 65 (group B) and very old patients over 80 (group C), we described the flow of each group in terms of outpatients, admissions, entrance into the Intensive Care Unit, and convalescence. The ratio of entrance into the Intensive Care Unit reflected the severity of the patient's condition, that of group A was only 49.0% and those of groups B and C increased up to 75%. The mortality rate of group A was 19.3%, and those of groups B and C were 43.3% and 50.0% respectively. Moreover, aged patients could not be discharged very rapidly. Particularly, those in group C could only leave the hospital in the ratio of one in four. Although 2.820 patients who entered the Intensive Care Unit were classified in group A (76.6%), group B (23.4%) and group C (5.4%), the number of patients in group C increased by 360% over the eight year period. However, no difference among the three groups was observed concerning the average days of stay in the Intensive Care Unit.

The average duration of hospital stay was also examined. The Ministry of Welfare in Japan reported that it took 40.9 days to leave the hospital on average, and that it took an average of 87 2 days for aged patients over 65 to be discharged. However, in this study, it took 19.5 days for younger patients, 20.3 days for old patients and 17.6 days for very old patient. Next we analyzed the relationship between their convalescence and the average days of stay in the hospital. For the old group, it took 21.8 days to be discharged, 26.5 days to be transferred and 13.6 days to die. To use a rehabilitation system with the early introduction of physical exercise in cooperation with referential facilities is important if we want to shorten hospitalization.

Dead on arrival (DOA) patients and bedridden old patients have been of deep concern to us as of late. 624 DOA patients were brought to our institution over the eight years, 209 in the first period from 1980 to 1983, and 415 in the latter period between 1984 and 1987. To sum up, the ratio of the number of DOA to total patients has increased markedly from 8.7% to 14.5%. It has even increased 1.8 times in younger groups from 7.5% to 11.9%, and it has increased 2.4 times, from 14.7% to

27.4% in the aged group. In short, this marked increase in DOA patients worries us. Moreover, the convalescence of bedridden patients was quite poor. Only one patient recovered completely, ten became no more than prolonged unconsciousness patients, and 178 died.

In the 65 year old category, there were 8 patients in the first period and 32 in the latter period. Their convalescence was poor overall and their mortality rate was 70%. It is said that there are 660,000 bedridden old patients in Japan. How to treat them if they would suddenly get worse is a serious problem.

In considering the possibility of deteriorating health, we doubt whether it is such a good thing to do our best to save any elderly patient. From the point of view of our role, we must think of saving lives, however, we must also make judgments from the point of view of the quality of life and the will to live.

In this way, there are several problems involving emergency care for elderly patients, such as the sharp increase of very old patients, change of disease pattern, variant accompanying disorders and complications, increase in the number of aged DOA patients, prolonged hospitalization, poor convalescence, and so on.

In conclusion, we would like to make the following suggestions.

First of all, we need to give further consideration to the special problems of elderly emergency patients and to research the limitation of treatment.

Secondly, the role of home doctors should be expanded when an aged patient has taken a turn for the worse is also necessary. Home doctors should examine such a patient inclusively, consulting with them and their family. In other words, we expect home doctors to be able to judge whether old patients should die at home in peace, or whether they should be brought to the critical care medical center. Physicians should consider the clinical crisis as well as the patient's will and dignity.

Thirdly, the "new media" will play an important part in the dissemination of information. In Japan, single-member families and those consisting of only a couple have been increasing. For this reason, we are afraid that we will face difficulties when we try to obtain information on arrival, if the patient's condition should suddenly deteriorate. To resolve these problems, several systems utilizing "new media" are being developed , such as an emergency dispatching system which sends to us information about the patient's crisis, and the Personal Health Data system enables us to obtain a patient's medical history, and the Picture Archiving and Communication System. These seem to be promising in identifying sudden deterioration of aged patients earlier and in treating them as soon as possible.

Fourthly, it will be important to establish rehabilitation systems especially with early physical exercise in cooperation with referential facilities. Then we may shorten the days of hospital stay and avoid elderly patients from becoming incapacitated and senile. A referral facility which acts as a hospital and home go-between is critically needed. Moreover, to increase the number of healthy aged people as well as to maintain their health, the establishment of a health care system, arrangement of a medical care system, and the promotion of sports among elderly citizens are needed.

Lastly, the concept of emergency care based on the patient's will to live and the provision of care to achieve a satisfactory quality of life based on each individual's capability and potential, are needed.