CF/RAD/USAA/DB01/2003-00628

II Document Register Number [auto] **CF/RAD/USAA/DB01/2003-00628**

ExRef: Document Series / Year / Number **E/ICEF/1975/L.1322-pdf-002**

Doc Item Record Title

Alternative Approaches to Meeting Basic Health Needs of Populations in Developing Countries. 122 pp [PDF file part 2= page 85 -122 includes annex VI through Annex XI]

Date Created / On Doc	*Date Registered*	*Date Closed / Superseeded*
25-Feb-2003	25-Feb-2003	

Primary Contact Owner Location **Office of the Secretary, Executive Bo = 3024**
Home Location **Office of the Secretary, Executive Bo = 3024**
Current Location **Record & Archive Manage Related Functions=80669443**

I1: In Out Internal, Rec or Conv Copy?
Fd2: Language, Orig Pub Dist **English , L.Avail: E,F,S,R.. ; L.Orig: E-?**
Fd3: Doc Type or Format **pp = 122 p + ? b**

Container File Folder Record
Container Record (Title)

Nu1: Number of pages	*Nu2: Doc Year*	*Nu3: Doc Number*
122	1975	1322

Full GCG File Plan Code
Record GCG File Plan

Da1: Date Published	*Da2: Date Received*	*Da3: Date Distributed*	*Priority*
30-Dec-1974			

Record Type **A04 Doc Item: E/ICEF 1946 to 1997 Ex Bd**

DOS File Name

Electronic Details **No Document**

Alt Bar code = RAMP-TRIM Record Number **CF/RAD/USAA/DB01/2003-00628**

2 SIDED

Notes
** For Board action see E/ICEF/CRP/75-44 ,*
Document Format Series/Year/SubSeries/Number/Rev: E/ICEF/1975/L.1322; Doc Series/SubSeries/Year/Number/Rev: E/ICEF/L/1975/1322
Doc Series: E/ICEF/L; Series Valid date on import: 01-Jan-1950; Doc Year: 1975 ; Doc Number: 1322 ; Doc

Print Name of Person Submit Images	**Signature of Person Submit**	*Number of images without cover*
A. Koff		37

ANNEX VI

TANZANIA'S APPROACH TO DEVELOPMENT OF HEALTH SERVICES

Tanzania's approach to meeting the health needs of the majority of its population must be considered within the constraints imposed by its lack of financial and manpower resources, Tanzania being one of the countries with the lowest G.N.P. per capita in the world, and also in the light of its colonial past, which left it with the barest minimal health infrastructure which had to be improved upon following political independence.

The United Republic of Tanzania has a land mass of approximately a million square kilometres. The capital has recently moved from the coastal town of Dar-es-Salaam to the town of Dodoma in the central part of the country. Much of the country is dry. Large areas are covered by scrub and grassland, except in the region surrounding Mount Kilimanjaro where there is a good rainfall.

The population was estimated at about 13.5 million in 1972. The birth rate was 47 per 1000 and the crude death rate estimated at 20 per 1000, giving rise to a natural growth rate of 2.7%. Like most developing countries, the life expectancy at birth is very low and stands at 44 years. The infant mortality rate is between 160 to 165 per 1000.

Although Tanzania has a large land mass, it is sparsely populated. The people are agro-pastoral, with 92.5% of the population living in the rural areas. The main commercial crop was, until recently, sisal, which was grown in the large estates around Korogwe in the north and Morogoro in the south. Other cash crops are coffee, cotton, tobacco, and cashew nuts. Forestry is being developed rapidly. Diamonds are the most valuable minerals being mined in Tanzania. Tourism is also fast becoming a money-spinner, with the Serengeti National Park as the main attraction.

As in most developing countries, reliable statistics about the disease pattern in Tanzania are not available, and recourse therefore has to be made to hospitals and health units (health centres, dispensaries, etc.) and admission records supplied by the Ministry of Health. Most of the morbidity and mortality results from communicable diseases of an endemo-epidemic nature (no less than 50 communicable diseases have been diagnosed in this country). Nutritional diseases, complications following pregnancy and delivery, and chronic and degenerative diseases are also found although their effects are relatively unimportant in comparison with the group of diseases mentioned above. The causes of mortality have been ranked as follows: acute respiratory diseases, measles, enteritis and diarrhoea, malaria, nutritional diseases including malnutrition, and complications following pregnancy and delivery. In spite of inadequacies, this list clearly indicates the epidemiological priorities and the type of health actions facing the Tanzanian health authorities.

Mainland Tanzania has 128 hospitals with 18 700 beds, making one hospital bed available for 720 inhabitants. There are 90 rural health centres, 1400 rural dispensaries, and 1500 health posts at village level. Rural health centres at the moment are supposed to provide health services for 187 000 inhabitants and a dispensary covers about 9300 people. However, the distribution of services varies from region to region. At the end of 1972 there was one physician per 28 000 population, with a correspondingly low ratio of other health professionals and auxiliaries, reflecting an overall shortage of health manpower.

Given the prevailing economic, social and technological context of Tanzania, the need for a national will to bring about a change becomes evident. This will was magnificently enunciated in the Arusha Declaration, which forms the basis of Tanzania's current health policy. Health was to be viewed within the framework of the national socioeconomic plan, with the main emphasis on rural development. The declaration calls for:

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1. Overall rural development

2. Government mobilization of all resources for the elimination of poverty, ignorance and disease

3. Active participation by the Government in the formation and maintenance of cooperative organizations

4. A contribution from the people (self-reliance) as an instrument for self-liberation and social development

5. People, land, good policies and good leadership as prerequisites of development.

In order to achieve meaningful development, the planning machinery was to be decentralized so that the people themselves could participate in the formulation of plans that would change their socioeconomic status. Hence, planning committees were established at each village, ward and district level, with the National Ministry of Economic Planning setting the broad outlines of national planning priorities and strategy. However, significant Government efforts only began in 1972/1973, when about 70% of the budget was devoted to rural development. The role of international agencies and other donor agencies in implementing the Government's objective of rural development should also be remembered, but "cooperation and not poison aid" remains the national theme.

The national socioeconomic plan aims at developing an integrated basic health infrastructure that will be acceptable and accessible to most of the population within the demographic socioeconomic and sociocultural framework, at minimal cost of delivery. Other related components of socioeconomic development in rural areas that were to be given prominence included the provision of safe water and universal free primary education.

In accordance with the principles of the Arusha Declaration, self-reliance was to be stressed. This means that local contributions in cash and kind were to be encouraged, giving the population an important role in the establishment of social services and necessary facilities. Guided by this principle of self-reliance, mass mobilization was used as a deliberate political tool to enhance the social consciousness of the population at large. People were encouraged to take the responsibility of meeting their socioeconomic needs as far as possible. Mass mobilization has also been applied in health educational activities, with emphasis on the importance of health promotion, the prevention of diseases and curative care.

As stated above, the successful integration of health plans into overall rural development required a comprehensive planning machinery, with carefully set priorities. Health services plans were formulated at different levels and coordinated with national development plans, in which the promotion and restoration of the health of the population are used as guiding principles.

In order to facilitate the provision of essential social services, people were encouraged to regroup in larger villages called Ujamaa-type villages. This village regroupment scheme tends to minimize the worst problems of having to plan for sparsely populated communities, thus achieving a wider coverage of the population with greater ease. To make the principle of self-reliance a reality, village health posts and dispensaries are constructed by the villagers themselves, the Government providing the necessary material, equipment and services not obtainable locally. The villagers also participate in the construction of their water supply system and are encouraged to build their own pit latrines and rubbish dumps.

Because of the acute shortage of resources in relation to the growing health demands from the rapidly increasing population, a departure from the traditional ways of providing health manpower has to be made if the existing shortage of skilled manpower and the widening gaps are

to be closed. To ensure rural development progress, specially trained development workers are used at village level. These workers are given special courses in health improvement, especially in preventive medicine, which enables them to guide development in the rural areas with the required emphasis on health. They also help to stimulate the community to recognize their main health problems and jointly work out solutions, using locally available resources.

Following the overall principle of decentralization and mass mobilization in the country, the organization for health services was decentralized in July 1972, in an attempt to put most of the decision-making machinery in the hands of the people themselves in the regions and districts and even the villages.

In each region there is a regional medical officer, who is a member of the regional development committee. He is at the same time the director of the regional hospital and coordinator for the implementation of health policy in his region. At the district level there is a district medical officer, who has the same functions in his district. In the rural areas there are rural health centres and dispensaries and, at the village level, a village health post.

The rural health centres and dispensaries are intended to provide comprehensive health services for the rural communities. However, the problem of imbalance between curative and preventive activities still looms large, even in rural areas. The main aim of the development of rural health manpower in Tanzania is to staff the rural health services with primary health workers. Four main categories are involved: medical assistants, rural medical aides, maternal and child health aides, and health auxiliaries. Activities at each rural health centre and dispensary can be broadly divided into three: diagnosis and treatment, maternal and child health work, and environmental health work. The production of various categories of staff to cover these activities in the rural area is one of the achievements of the rural development programme. The use of primary health workers in rural areas highlights the equitable distribution of scarce health resources, resulting in wider population coverage and better utilization of available health services at minimum cost.

A village medical helper in an Ujamaa village is supported by his village, with a rural health centre providing technical supervision and the central Government supplying equipment and drugs. His training in health is a 3-6 month practical first-aid course at a health centre or at the district hospital. These courses will be repeated periodically.

The specific function allocated to the maternal and child health aide, formerly the village midwife, is maternal and child welfare, including family planning and nutrition education. It is intended that the MCH aide should work in two places, at the dispensary and at the rural health centre. She will be the only maternal and child health worker at the dispensary level, but, more often than not, she is likely to be an assistant to a trained nurse at the health centre level.

Health auxiliaries have been specially trained and employed for environmental health in the rural areas for the past six years or so. Health auxiliaries are employed at both health centres and dispensaries.

A rural medical aide has at least primary school education and receives his medical training from a course lasting at least three years. It is stressed by planners in Tanzania that the training of a rural medical aide should not consist of a watered-down programme for physicians. Rather, the training syllabus is developed on the basis of the requirements and goals of a dispensary and the most common activities of a rural medical aide.

The most important institution in Tanzania's rural health services is the rural health centre. Since the medical assistant is trained with the objective that he should be the man in charge at this institution, it follows that he is the most important category of Tanzanian

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rural health staff. With an educational background of at least 11 years of general schooling, the medical assistant gets three years of medical education, his course comprising basic medical sciences, clinical medicine, and community medicine.

The assistant medical officer bears the title of doctor, is originally trained as a medical assistant, and then has at least four years' work experience followed by an 18-month training course. As one might expect, he is able to perform functions lying somewhere between a medical assistant and a physician.

The philosophy of training doctors in Tanzania is to direct education so that it meets local needs and problems. In addition to performing clinical tasks, doctors must be health organizers and administrators of health teams. This implies that part of a doctor's training should take place in rural communities. In the medical faculty of the University of Dar-es-Salaam, community medicine is taught throughout the 200-week course of study and a total of at least 22 weeks must be spent in communities doing field work.

The following figures explain the strategy and the action taken for the total coverage of health services in rural areas. In 1971 there were 74 rural medical aides, in 1972 the number had increased to 578, and between 1973 and 1980 intensive training will be organized for peripheral primary health workers with an expected total output by 1980 of about 2500.

Medical assistants did not exist in 1961. In 1972 there were 335, and it is expected that by 1980 there will be more than 1500. The total number of assistant medical officers in 1961 was 22, in 1972 140, and in 1980 it is expected that there will be about 400. Particular emphasis will be placed on the training of MCH aides, and the total expected number in 1980 is more than 2000.

At the same time the number of health centres will be increased from 105 in 1973 to 300 by 1980, and the number of dispensaries from 1500 to 2300. The number of hospital beds will not be increased as the aim is to maintain the same bed/population ratio; the number of beds will be increased only in relation to the population.

Government health expenditure has risen from Tanzanian shilling 50 million[1] in the fiscal year 1961/1962 to over four times that amount in 1973/1974. The larger part of this increase occurred between 1971 and 1974. Although the absolute volume is small - about T.shs 15 per head of the population, plus an estimated additional T.shs 3 per head of the population on health in the private sector, giving a total of T.shs 18 per head of the population - this means that Tanzania spends about 3% of its G.N.P. directly on health care (excluding water supply, sanitation, nutrition and other indirect but important determinants of health).

In spite of the attractive and varied innovative features in Tanzania's health services briefly summarized above, the health situation in the country in 1974 is far from being ideal in terms of coverage and quality. It is evident that Tanzania still has to face problems and difficulties which in a way reflect its past history. Although Tanzania's financial resources are modest, they do not appear to constitute the only constraint on the rapid development of health services per se; other factors are the lack of suitably trained health manpower and a sociocultural background that prevents the maximum usage of the existing system. However, rapid development in the health field and other socioeconomic developments in recent years suggest that the basic health needs of the majority of the population will be met during this decade.

Although the Tanzanian approach has to be understood in the context of the strong socio-political atmosphere prevailing in the country, the innovative characteristics of the approach could be adapted in solving the pressing health problems of any developing country with similar

[1] 1 Tanzanian shilling equals approximately US$ 0.14.

health problems but with a different sociopolitical system. The approach is attractive in that it clearly demonstrates what can be done with minimum resources. What is needed is a strong national will, objective examination of the health problems of the country, a clear definition of targets, programmes and priorities in planning, and close adherence to a definite policy in the allocation of resources and the implementation of measures, as in Tanzania.

ANNEX VII

VENEZUELA

THE "SIMPLIFIED MEDICINE" PROGRAMME

Venezuela, with a population of 10 081 568 at the 1971 census and a growth rate of approximately 3.5% over the last 10 years, presents the trends and characteristics typical of developing societies with a high rate of growth and a preponderance of the young. During the last three decades there have been great changes in the economic and social conditions, which have been reflected in the general levels of health in the country as a whole. Tables 1 and 2 give an idea of the trends of certain health indicators and of the decrease in certain communicable diseases.

Table 1

Selected vital statistics of Venezuela for 1950, 1960 and 1970

	1950	1960	1970
Population (in millions)	5.0	7.4	9.8
Population age 0-14 years (%)	42.6	44.8	47.1(a)
Crude birth rate per 1000 population	42.8	44.0	41.0
Life expectancy at birth (years)	58.0	66.1	65.6(b)
Crude death rate per 1000 population	10.9	7.5	7.0
Infant mortality per 1000 live births	79.7	55.2	48.2
Deaths 1-4 years age per 1000 population	11.7	6.1	5.4
Proportional "undiagnosed" mortality	48.2	30.3	23.0

(a) 1971 census
(b) for 1968

Table 2

Cases of selected acute diseases per 100 000 population for the notification area* of Venezuela

Diseases	1950	1960	1970
Diptheria	38.3	16.5	2.0
Typhoid fever	57.3	25.7	1.7
Malaria	80.0	25.0	10.5
Measles	342.2	517.0	496.6
Tetanus	26.8	22.9	5.1
Poliomyelitis	4.2	8.3	0.7
Smallpox	82.6	-	-
Murine typhus	6.7	0.4	-

* "Notification area" is the locality with a permanent medical (with doctor) service. These covered an estimated 53.2% of the population in 1950, 60% in 1960 and 72.5% in 1970.

The above data, if accepted without further analysis, do not reflect the real situation. Venezuela, like many other developing countries, presents great contrasts between large urban concentrations of population (with the increasing problems of "marginal" areas as the "urbanization" process continues) and rural populations living in small villages or isolated ranchos with a rudimentary economy. Table 3 illustrates the variations of some health indices between different population localities, mainly rural and urban.

Table 3

Mortality indicators in four population aggregates - Venezuela, 1969

	Type of population aggregates			
	A	B	C	D
Crude death rate per 1000	6.1	8.1	8.4	8.0
Proportional mortality by age:				
under 1 year	25.7	28.9	28.4	28.4
1-4 years	7.4	10.8	11.6	14.3
50 years and over	49.4	39.5	39.3	35.5
Proportional "undiagnosed" mortality	5.7	17.4	26.8	50.2

A: Population 40 000 and above
B: Population 5000-39 999
C: Population 1000-4999
D: Population under 1000

According to the 1971 census, out of 21 120 population centres existing in the country, there are 20 535 population centres with 2500 persons or less in rural and intermediate (between rural and urban or semi-rural) areas representing 27.26% of the country's total population. Despite the fact that urbanization has been a prominent phenomenon in Venezuela, the population is still very scattered and it is difficult to provide it with services, including basic medical care.

The above considerations led a group of interested professionals working in the Ministry of Health and Social Welfare to undertake an organized effort to establish a programme offering basic care to the scattered population with due regard to the country's actual resources. The idea was to have a simple, realistic but, at the same time, practical approach to the problem. In 1961, at the Second Venezuelan Conference on Public Health, it was proposed to adapt certain experiments of other countries, particularly those of the USSR and certain African countries. It was obvious that it was not feasible to establish a doctor or a highly educated medical person on a permanent basis in each of the main centres of a few thousand localities in rural areas. There already existed some 1300-1400 rural dispensaries, which were visited once a fortnight or once a week by a doctor from a town health centre who just gave treatment to the patients. In each dispensary there was a girl without training employed to help the doctor, to do some cleaning and, if she could, to give some dressings and intramuscular injections.

The group studied the different alternatives of other countries in the light of local situations and existing facilities in Venezuela. As a result of its studies the proposal was made that a "health technician" should be created to diagnose and treat easily recognized diseases in a standard way and be responsible for basic sanitation. While the Ministry of Health received the idea favourably, there was an unfavourable reaction from the medical profession. The Venezuela Medical Federation invited the group of interested professionals of the Ministry of Health to present a document justifying the experiment and describing the various aspects of the programme. The document presented to the Federation in 1963 described

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the programme under the title "simplified medicine": medicine - to indicate that the service to be provided was comprehensive or integrated, covering both preventive and curative aspects; and simplified - to indicate that it must consist of simple procedures of frontline medical care but having at the same time indispensable support in every aspect, particularly in technical advice, supervision and the possibility of referral to the higher levels of the organized services.

Thus, simplified medicine offers basic health care to the rural population through auxiliary nurses working within the system of health delivery services, which provide continuous supervision, training and referral facilities. The basic components of the care provided are as follows:

(1) Promotion of health: elementary services for mothers and children, health education and environmental sanitation.

(2) Protection of health, mainly through immunization.

(3) Restoration of health: under the form of first aid or simplified therapeutic action.

(4) Registration of vital events.

(5) Surveillance of certain diseases such as malaria and tuberculosis. The auxiliary nurses are located at the peripheral level in dispensaries in rural areas and have to cover a certain number of the population (from 500 to a few thousand, depending on how scattered it is).

There are certain criteria for the selection of trainees:

(1) they must be national or permanent residents of the locality;

(2) they must be acceptable to local leaders;

(3) their age must be between 18 and 40 years;

(4) they must have had primary schooling for six years.

The programme for the training course for auxiliary nurses is the Manual of Instructions. This big book is the auxiliary nurses' authority for their work. It lays down explicit instructions on the type of preventive and curative medicine to be undertaken and on when and how to refer cases to a higher network. It authorizes treatment for early, recognizable common ailments such as diarrhoea in infants, and indicates how these are to be treated by diet and medicine whose administration will not injure the patient. It teaches nurses to administer first aid for accidents while waiting for the doctor. It requires them to educate local midwives and teach members of the families in their community how to protect the child from birth to school age and beyond. It tells them to cooperate with auxiliary personnel in other fields such as education, agriculture and social welfare. It points out how vaccination may be ineffective through faulty administration or a lack of facilities for preservation.

From the beginning it was decided that the training should be based on what not to do rather than what to do. In other words, it should be essentially oriented to "practice", namely to give minimal indispensable theoretical knowledge and to develop skills for:

1. identifying those diseases (or syndromes) easily recognizable and of greater frequency in the rural environment;

2. applying simple measures of promotion, protection and restoration of health according to very clearly delineated guidelines in order to avoid abuses; and

3. coordinating efforts with other people interested in the progress of the community (teachers, home demonstrators, police, etc.).

The course is held in a district health centre and never in a state capital, which might have an unsettling effect on the auxiliary nurse. The teaching staff consists of graduate nurses specially trained in this type of teaching. The director of the health centre in the district exercises technical supervision and, together with other health staff from the district, lectures and arranges patient and group demonstrations. The teaching is essentially practical, with no theoretical teaching other than that contained in the manual. The students are not taught to deliver babies, only to supervise the local midwife and ensure a hygienic approach. The maximum number of students in a training course, which is of four months' duration, usually does not exceed 12.

Supervision is undertaken by:

1. periodic visits (usually weekly or every two weeks) by the doctor from the rural medical post or the health centre to which the dispensary is assigned;

2. periodic visits by the regional nurses' supervisor. In Venezuela experience has shown that for this job it is preferable to use a male graduate nurse, since he must travel considerably, spend nights in villages with little comfort and stay as long as is required for a satisfactory review of the auxiliary's work and for the correction of faults encountered, which might be for a period of several days. With the type of initial training received by the auxiliary, it is indispensable to complement it with inservice training, which is one of the objectives of the supervision by the nurse. The supervisory visits by the nurse vary in frequency depending on circumstances; however, an average of every three months can be estimated.

Most of the expenses of the health services in Venezuela are borne by the national and state governments. Some municipalities contribute, but in general their contribution is unimportant. One of the objectives of the simplified medicine programme in Venezuela is to promote the more active participation of the local communities. Since health care is free, local people do not need financing at the local level. Nevertheless, there is some community participation, for instance in the maintenance and running costs of buildings and the construction and equipment of dispensaries.

Brief summary of the results

Up to the end of 1973, 315 dispensaries in 12 states (out of 23 main political divisions) had been staffed by the auxiliary nurses trained for simplified medicine. They cover a rural population of about 280 000 (the total rural population is 2.3 million). The programme has been slowly developing and spreading gradually from state to state. Among the 12 states in which simplified medicine is carried out, there are one or two states that have a high coverage of the rural population.

The auxiliary nurses of simplified medicine carry out the most necessary vaccinations routinely and case-finding for tuberculosis and malaria. Pregnant women are followed up for any abnormalities and are referred to the rural doctor if necessary. Hospital delivery is encouraged, particularly for primiparas. Local midwives meet periodically at the dispensary

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for discussion and to review the contents of their bags. Traditional birth attendants have been trained by auxiliary nurses in carrying out hygienic delivery. Children are followed up regularly for vaccinations, weight, supervision of feeding, etc. Children with signs of malnutrition receive supplementary feeding. Pregnant women also receive supplementary feeding as well as iron tablets.

Elementary medical care is one of the major activities of the programme. The auxiliary gives treatment (including penicillin, sulfonamides, and other basic drugs) in cases he is able to diagnose (e.g., diarrhoea, dysentery, pneumonia). He must not go beyond this. Great use is made of referrals to the nearest health centre or rural doctor. No car or bicycles are assigned to dispensaries. Home visiting is carried out on foot.

Health education is given at the dispensary and through home visits, special mothers' classes, children's clubs and community meetings.

No serious attempts have been made to evaluate this programme from the viewpoint of coverage, utilization and cost/benefit. It would be very difficult, if not impossible, to quantify the role of simplified medicine, since many other factors in the rural areas have also greatly influenced changes in the population's level of living. To measure success with health indices and statistics is difficult, because not enough data are available from before the establishment of simplified medicine or at present. It needs a health survey and an in-depth study to assess the degree of success through some health indicators. Recently an agreement was signed between the Ministry of Health and the International Development Research Centre, Canada, to analyse Venezuela's 10-year experience of simplified medicine. This evaluation will be carried out by the School of Public Health, the University of Venezuela.

The evaluation is designed to provide answers to three main questions: the effectiveness of the services rendered; the reactions of the communities served; and the cost of the programme.

ANNEX VIII

JAMKHED PROJECT - INDIA

This comprehensive rural health project is designed to meet the basic health needs of a rural population of 40 000, mainly utilizing the local resources of the area.

The project was initiated late in 1970 in Jamkhed village, Ahmednagar district, some 400 km south-east of Bombay. The area is agricultural, with scarce resources and poor irrigation, and has suffered three consecutive years of drought.

The project works in close cooperation with the Government health services system. The 30 villages that are covered by the project are well away from the primary health centre of the Government service. Four of the villages have Government subcentres with auxiliary nurse midwives and the project works in close collaboration with them and has a referral centre for family planning and medical and surgical procedures beyond the scope of the Government subcentre.

The main objective is to meet the basic health needs of the population by providing the following services:

1. MCH

(a) Antenatal care, perinatal care, care at delivery, infant and child welfare, family planning.

(b) Immunization of children and mothers (smallpox, diphtheria, whooping cough, tetanus, polio, BCG).

(c) Prevention, detection and correction of malnutrition.

(d) Education and encouragement of community to meet own nutritional needs.

2. Health education in the community.

3. Diagnosis and treatment of simple common illnesses.

4. Medical and surgical emergencies.

5. Detection, prevention and control of such chronic illnesses as tuberculosis and leprosy.

6. Prevention and treatment of blindness.

7. Environmental health through the provision of safe drinking-water.

An effective referral system for all the above activities is offered by the project centre in Jamkhed.

In order to meet the objectives quickly and cheaply, the following approaches have been adopted:

1. Extensive community participation.

2. Development of a training programme and utilization of village health workers.

3. Development of agriculture for the nutrition programme.

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4. Provision of safe drinking-water by the sinking of deep tube wells with hand pumps in the most needy villages.

5. Organization of clinics at times determined by the activities of the community and not at the usual times.

6. Health education - an important component of the project. Health education is given with the help of audiovisual aids such as flannelgraphs, flash cards, puppet shows and film strips. The community has helped by selecting for the purpose people with histrionic talent. A mobile educational exhibit has been developed and is taken from village to village and mass health education is given with the help of puppet shows. This is followed up by village health workers talking to smaller groups. The health education given is directed toward creating an awareness of the various health problems and their solutions.

General Development Scheme

In order to improve the quality of life, certain development programmes have been initiated by the local health authorities.

The agricultural projects include sheep-breeding, some 300 selected rams having been introduced to improve the local flock, and an artificial insemination centre for cows. Twenty persons were each given 1000 rupees to start poultry farms. An oil mill and a seed improvement scheme were started but discontinued on account of the severe drought.

The Government has also made available housing loans at 8% interest payable in 20 years. Many people have been unable to avail themselves of the loans because they have not possessed the initial capital.

The development priorities as defined by the local authorities were as follows:

(a) development for agricultural production - water supply;

(b) extension of electricity for irrigation pumps;

(c) improved communication between villages - roads;

(d) buildings:

(1) primary health centres - family planning centres;

(2) storehouses for food grains;

(3) schools;

(4) other buildings.

Project administration

The project has a governing body composed of a chairman, secretary, treasurer and four other members. The two project senior physicians are ex-officio members. The nursing profession is represented, likewise the World Health Organization Regional Office for South East Asia. The governing body approves the general policy and budget, and appoints the

project director. The project director acts as chief executive and administrator and is assisted by an advisory committee composed of local leaders and representatives of the various groups in the community. The committee meets once or twice a year but a smaller working group meets every two or three months.

There is an advisory committee which is composed of local leaders and care is taken to see that various groups in the community - political parties and castes - are represented. The block development officer (a government official) is an ex-officio member of the advisory committee. Their function is to act as true representatives of the community. There is, within this group, a working body which meets once every two or three months and a general body which meets once or twice a year.

Project structure

A three-tier system of responsibility has been developed through the use of two health teams. The first line of contact with the community is the village health worker, selected by the communities themselves. This ensures effective communication with the villagers. Living in the village herself, she is aware of the problems and helps to trace target groups in the project's priorities, gives health education and first aid to the people and works with the team in house-to-house surveys. In-service training is given to these village health workers and, in addition, they receive training for two days a week in the main centre at Jamkhed. They receive an honorarium of one rupee per day.

The second tier consists of the nurse supervisor, medical social worker, auxiliary nurse midwife and leprosy and laboratory technicians. They are responsible for supervision of the village health workers. They visit each village once a week, carrying out house visits to detect malnutrition and communicable diseases (leprosy and tuberculosis), to look at expectant and lactating mothers and to consider which couples are eligible for family planning. Appropriate promotional health talks (using audiovisual aids, including movies) and programmes of, for example, immunization are arranged periodically. The members of the team are given in-service training together as a team, and each member has a specific role in the delivery of health care. The teaching emphasizes the project priorities. Ayurvedic and homeopathic medical practitioners function independently in the area, but most cooperate actively in the project and two Ayurvedic doctors have been integrated into the project health teams.

The third tier consists of the two doctors, whose main functions are administration, supervision, training and the day-to-day running of the main centre at Jamkhed, which is the only medical facility in the area, and of the 30 subcentres of the project.

Of particular importance to the success of the project in providing comprehensive services is the firm decision of the two staff physicians to allocate their time in the proportion of 30% for curative services, 30% for public health services, 20% for supervision, 10% for training and 10% for self-education.

Finances

The project's total budget was 520 000 rupees. Seventy per cent. was derived from local fees and a government grant for family planning activities. The other 30% was obtained from donations. It is hoped that by 1975 the project will be completely self-supporting. Curative services absorb 30% of the budget, while 60% goes into preventive services and promotional programmes. Administration and training activities account for the balance of 10%.

Annex VIII

Project orientation and implementation

At the inception of the project the main health problems were a high population growth rate and high infant and child mortality rates. Chronic diseases such as tuberculosis and leprosy and malnutrition were also common. Facilities for adequate health care were poor and water was in short supply. Agricultural activities were therefore at a low ebb.

The project was initiated with the minimun of resources. There was close collaboration with the "dais" (traditional birth attendants), indigenous practitioners and the people carrying out the government development programmes.

The initial aim was to reduce the birth rate from 40 to 30 per 1000 in six years and simultaneously to reduce the mortality rate of children under five years by 50%. Cases of tuberculosis and leprosy were to be identified and treated, primary health care was to be provided for the community, and training would be organized for auxiliary staff.

In order to achieve basic health care coverage at low cost, the project introduced the following innovations.

1. Agricultural support of the nutrition programme.

2. Deepening of wells for irrigation and the provision of safe drinking-water.

3. Use of fees derived from curative services to support promotive and preventive health programmes.

4. Training and use of village health workers.

5. Community participation and involvement in decision-making and support in the delivery of comprehensive health care.

6. Incorporation into the project of indigenous practitioners, Ayurvedic practitioners and dais.

House-to-house surveys were organized to provide baseline demographic, morbidity and mortality data, from which the accomplishments of the project can be evaluated in relation to the stated objectives. Each of the 30 villages is visited at least once a month by the mobile health team.

Agricultural support of nutrition programme

The project has identified itself fully with the felt needs of the population. In order to implement its nutrition programme, the project provides agricultural support by lending tractors and other machines to local farmers to plough and cultivate otherwise fallow land; in return, it receives 50% of the produce with which to support the nutrition programme. The programme is also supported by small poultry and dairy farms, which provide eggs and milk.

Supplementary feeding programmes have been organized in 20 villages and are in full operation. In 1973, 1200 children received a regular daily morning meal.

Nutrition was a major problem during the drought, and children, expectant and nursing mothers and patients suffering from tuberculosis were all given supplementary food.

The nutrition programme is fully self-supporting and does not receive any assistance whatsoever from outside.

Deepening of wells for irrigation and provision of safe drinking-water

The drought badly affected agricultural production. To protect the community's 380 acres of land, 15 wells were deepened in 1973 to enable them to be used for irrigation purposes.

Lack of safe drinking-water in the area contributes to a large extent to various illnesses. In 1973, a tube well was constructed in each of the 21 villages, with the active participation of each village community.

Use of services of village workers

The comprehensive rural health project aims at the methods of health care delivery best suited to the needs and resources of the area.

The third level in this system, as mentioned, is the village-level worker, who is a member of the community and constantly in close contact with her fellow villagers; she therefore acts as the liaison officer between the community and the more educated nurse and other health worker. Delegation of each task to the lowest member of the team capable of performing the task satisfactorily is one of the ways of overcoming the problem of inadequate manpower and financial resources.

A cultural gap was found to exist between the city-educated health worker and the illiterate rural folk. Very often a patient, after listening to the advice of a physician or nurse, would more readily accept the advice of the illiterate watchman or sweeper of the health centre. This is because he identifies with another illiterate person and feels closer to him than to the educated sophisticated physician or nurse. In one instance, a city-educated nurse staying in a village for several months could not persuade a single woman to undergo tubectomy. On the other hand, an illiterate dai from the same village was able to refer 75 women for tubectomy within the same period of time. Taking these attitudes into consideration, it was felt that the best way to get into the community and teach it to accept new methods and change its attitudes was to enlist the help of women from within the community.

The result has been, to take another instance, that a village health worker has been able in a relatively short period to persuade 200 women to accept antenatal care and has referred over 100 women for tubectomy. She is also able to follow up patients with tuberculosis and leprosy and persuade them to take treatment regularly from the clinic.

The village community is asked to find women from their own community who would be interested in joining the health care team. Usually, women with no household responsibilities volunteer for such work. They come to the health centre at Jamkhed on Saturdays and Sundays, and there are given regular classes on various health topics by the physicians, nurses and paramedical workers. The women are mostly illiterate and most of the teaching is therefore done with the help of flash cards and charts. The five priorities of the project are stressed and the village-level worker's role explained. Each class starts with a summary of the previous week's teaching and a discussion on the application of the knowledge gained to the work in the village. The women are also taught the use of flash cards so that they can use them in their promotional work.

Eight workers are being trained by this method and the results appear very encouraging.

Community participation

From the onset, community participation has been a sine qua non of the project. The community in Jamkhed is poor and lacks good housing facilities, electricity and running water. However, it provided simple accommodation for the work and for the staff and donated land and buildings for the work, not only in the main centre but also in the villages. In all the villages the community assists voluntarily in the preparation of food for the nutrition programme. In addition it contributes to the building of roads for the better access of health team workers to the villages. A youth organization collects blood for the health centre and villages and is particularly active in mass mobilization for immunization and in other public health activities. The community is involved not only in the implementation of the programme but also in the decision-making process. It feels strongly that the health centre and the whole health services system are a part of their own system and considers all their problems as its own. In effect, it has developed a strong sense of belonging and involvement.

The incorporation of indigenous practitioners in the project, with the facilities for referral offered to them, is clearly an advantage to the community. Ayurvedic practitioners are members of the staff and very close cooperation is found in the villages with the local Ayurvedic practitioners.

ACHIEVEMENTS

The comprehensive rural health project has achieved considerable success in realizing its objectives in a relatively short time, regardless of the fact that a drought was experienced during the past two years in the project area. This, in fact, was an additional challenge that the project faced successfully. Specific areas of activity in which achievements have been made are the following:

1. Mass immunization (DPT, BCG and polio). Mass vaccination programmes are regularly carried out for children under five. BCG is given until the age of 20 years, since tuberculosis is one of the major problems.

2. Leprosy and tuberculosis detection and treatment. These are being continuously developed. A constantly increasing number of second visits is noted, possibly the result of effective health education efforts among patients. The number of new patients with leprosy and tuberculosis is slightly decreasing, probably as a result of detection activities earlier in the year rather than of a lower morbidity.

3. Family planning and welfare. It is clear that rapid progress has been made in this field within the period of one year.

4. Increase in the number of second visits. This is noted from month to month through the whole year. The number had doubled by the middle of the year and still increased over the second half of the year. Information about the number of women who have made these repeat visits is missing; if it were available, it would allow further conclusions regarding the efficiency of antenatal care. The number of first clinical attendances shows monthly variations with a slight, but obvious, increase over the year. The number of pregnant women in the area, or number of births, would help in further analysis of the effect of health education among women and allow assessment of the adequacy of antenatal care.

5. Regarding the prevention of pregnancy, the number of newcomers receiving oral contraceptives fluctuated from 10-20, increasing to 50-60 women in June and July. The number of old acceptors increased from 290 in January to 480 in December. Although it is clear that great progress was achieved between 1971 and the end of 1973, the service provided has still not sufficiently covered the female population and has not reached all groups equally. Among the women acceptors in 1973 there was a higher percentage of women with two and three children, possibly because the idea of an optimal family size is spreading through health education in the community, or because there is better receptivity to health advice at this age. Information on the total female population according to the parity will be needed for further analysis of existing problems and further development of the family planning services. Tubectomy was performed mostly on women with two, three and four children. There has been no appreciable change in the last two years; neither has the number of women requesting tubectomy increased greatly nor has the parity situation of women in 1973 changed essentially from that observed in 1971.

6. One thousand two hundred children have been having supplementary feeding and there have been enormous improvements in the water supply and irrigation schemes. Fifteen irrigation wells and 18 safe drinking-water supplies have been constructed. Curative services during the first half of 1973 were as follows: outpatients 4040; second visits 5580; inpatients 627.

CONCLUSIONS

Within the terms of reference of the present study, it seems clear that the project has achieved remarkable success. Within a very short period of time the target population has been fully provided with primary health care services, and these services have been integrated effectively with services meeting the agricultural and water supply needs of the people. All the services are extensively and enthusiastically utilized and financially sustained by the community.

Several factors seem relevant to the success of the project. One of the most important is that the project is based on the recognition, particularly by the project leaders, of the priorities determined by the community. In so far as the community is concerned, health is not a number one priority; agriculture, water supplies and housing are more important. The project has therefore identified itself firmly with agricultural improvement, acquiring a tractor to be hired out to farmers and providing assistance in dairy and poultry farming and irrigation schemes. In effect, it appears that in such communities, which have a low economic status and a low per capita income, doctors and health services will need to identify themselves with the community's priorities in order to fulfil health objectives.

The effective use of the health team approach, with delegation of responsibility to the least trained member of the team capable of performing any particular task, makes full coverage a reality. The awakening within the community of concern for its own health needs also contributes greatly to success.

Finally, the enormous dedication of the health team and the dynamic leadership of the two doctors through whose efforts and initiative the project was begun have contributed greatly to the total success of the project.

ANNEX IX

USE OF VILLAGE HEALTH WORKERS AND TRAINED TRADITIONAL BIRTH ATTENDANTS IN NIGER: DEPARTMENT OF MARADI

Background information

The Maradi Province (Department) is located, by and large, in the pre-desertic savannah area. It has about 700 000 inhabitants comprised of about 11% nomads (Peuhls and Tuaregs) and 88% settled Hausas living in an area of about 35 500 square kilometres. Population growth is estimated at 2.7%. Administratively, the Department is divided into six districts (arrondissements) and one municipality (commune). Its road network is poor. The local economy is mainly agricultural.

The crude mortality rate is estimated at 27 per 1000, while the infant mortality rate ranges from 250 to 300 per 1000 births. Malnutrition is common during the weaning age, and the hygienic conditions are not satisfactory. The main causes of sickness are infectious and parasitic diseases - malaria, gastrointestinal disorders, and eye and skin infections.

The health services in Maradi include: the headquarters of the Provincial Health Services; the Provincial Hospital; one mobile team for the Province (consisting of two squads for vaccination and detection of disease); the Maradi urban area; six health districts. The urban area and the districts have financial autonomy, i.e., the health activities are financed from the local and not the national budget.

Within these areas there are 17 rural dispensaries, three medical (health) centres with 82 beds, and three maternity hospitals (32 beds). The bed/population ratio is 1/6000 when urban Maradi health services are excluded. The next Five-Year Development Plan (1975-1979) proposes to add one rural dispensary, three medical centres (60 beds) and three maternity hospitals (24 beds). The privately funded health infrastructure will be reduced to one leprosarium and one rural dispensary.

The personnel working in the local public health services comprise eight medical officers (four working in the hospital in Maradi, three living in town but working in the province, and one in Tessaoua), one dentist (working in the hospital in Maradi), three midwives (two working in the hospital and one in the province), 24 registered nurses (six in the hospital, the rest working in the province), 57 certified nurses and 16 auxiliary nurses. The uneven distribution of the health personnel provides, in rural areas, a coverage of one medical officer per 170 000 and one nurse or auxiliary nurse per 9430 inhabitants. The catchment areas of rural dispensaries do not extend beyond a 10-15 kilometre radius.

Less than 15% of the existing patients in the district are covered by the health services, so that 80-85% of them have to take care of their own health problems assisted by either native doctors or traditional healers. This lack of coverage is not only due to an insufficient infrastructure but also to the passive attitude of the health personnel. Most of the dispensary nurses expect the patient to come to the dispensary. Moreover, the concepts of preventive medicine remain theoretical and MCH and health education do not frequently form part of the activities currently carried out. This lack of interest and inertia on the part of the nurses is apparently due to their ignorance of local public health problems, their training being almost exclusively geared to curative practice.

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Extension of health protection of the rural population

Although the coverage of the population is still weak, several activities have been undertaken and have considerably improved the local situation. The strategy used and implemented gradually consisted of:

- initiation of better health coverage by means of joint information efforts made by the rural animation services,[1] the education and literacy services and the health services, supported by the political party as well;

- health protection by means of village health teams (for example, voluntary health workers, traditional birth attendants, traditional healers);

- orientation of the auxiliary health worker towards rural health through the practice of comprehensive health care and dynamic participation in educational, supervisory and technical activities.

This strategy is implemented exclusively by national personnel. It is the result of continuous operations research and communication with the local population. It is based upon:

- in-depth study and knowledge of the sociocultural and economic conditions of the areas to be covered;

- the organization of multisectoral groups to discuss local health problems and how to tackle them at the lowest cost; in these multisectoral groups high-level representatives of health, rural development, literacy, education and the ruling political party participate in discussions chaired by the highest administrative authority (the sous-préfet or préfet);

- continuous information, communication with and sensitization of the rural population with a view to their gradually increasing motivation and direct involvement.

The contacts with the population through the rural development services and the health services aim at:

(a) explanation of the objectives of the newly proposed community participation and the role the villagers have to play in it;

(b) selection of the village health workers by the villagers themselves;

(c) installation of the village health workers and/or traditional birth attendants after completion of their training;

(d) annual retraining of the village health workers in order to maintain and improve their level of skill.

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[1] Rural animation services: administrative, technical and educational structure, usually part of the Ministry of Development (Rural Branch) but sometimes of the Ministry of Education, whose function is to motivate people to participate in activities for the development of the rural areas.

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The village health workers and the village pharmacies

The choice of the village health workers is left entirely to the villagers themselves, provided that certain basic criteria are fulfilled, e.g., that he should be a volunteer, should live in the village, and should undergo the necessary training.

Essentially practice-based training is given during a 10-day period to the villagers designated by the community. This training is organized in the nearest dispensary or health centre by the nurse in charge, assisted by the chief nurse in charge of the health arrondissement. The courses cover: general health concepts, emergencies and referrals, epidemic diseases, health education (including nutrition), elementary health care, environmental sanitation and some record-keeping.

The main aim is to prevent diseases and wounds from becoming complicated while awaiting referral of the patient and to refer in time patients who cannot be treated with the elementary means available to better equipped health facilities. The aim also includes the improvement of environmental conditions in the village itself by organizing water disposal, cleaning of settlements, and similar activities.

Continuous health information is given to and received from the population and the village health workers through the strict and regular supervision carried out by the auxiliary nurse in charge of the nearest dispensary or health centre. In turn, this nurse receives support from the higher supervisory echelons.

Every year the village health workers already in service attend a 10-day retraining course in which it is proposed to introduce gradually new items related to local health needs, e.g. the treatment of malnutrition and the preparation of weaning foods. The cost of these courses is about F CFA 1500 (US$ 6) per person, and this covers most food expenses during the 10 days of training.

Experience has shown quite positively that the trained village health workers are capable of treating patients suffering from most common local diseases such as malaria, diarrhoea, superficial wounds and some skin and eye diseases. For this purpose they receive small quantities of basic drugs: an antiseptic, eye drops, chloroquine tablets, aspirin tablets, guanidine tablets. Some of these drugs are sold to the patients at fixed low prices and the money collected permits restocking of the pharmacy. Other drugs are distributed free of charge, e.g., mercurochrome, argyrol, methylene blue.

The first allocation of drugs is paid for by the budget of the district. The renewal of the drugs is financed by the villagers while the provision of those required is the task of the dispensary nurse supervising health activities at the village level. The average sale of drugs in the village amounts to F CFA 500 (US$ 2) per month. It is worth noting the existence of a village "health management" team, which controls the administrative functioning of the village health workers and their pharmacy. The training of the three members of this team takes three days. The chairman of the team assists in all financial matters, while the treasurer keeps the stocks of the pharmacy, purchases new drugs, and records all financial transactions. Since the village health worker is a voluntary worker, no payments are made for the health work he performs apart from the villagers providing his day-to-day subsistence (mainly food). In addition, he probably receives some gifts directly from the villagers in accordance with tradition.

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Achievements and prospects

At the end of 1973, 109 villages of the Maradi Department were served by 218 village health workers.

During 1973, 136 129 consultations were given by the village health workers in 88 villages (no reports were available for 21 villages). These consultations represent 12.8% of the total number of consultations given in the Maradi Department by the existing health organization workers.

The resources available from local health services will allow a reasonable and planned extension of the scheme to 30 villages a year - the training of 60 village health workers and the creation of 30 village pharmacies.

An interesting aspect of this activity has been the impact on the training, mobilization and motivation of the health personnel, mainly the auxiliary dispensary nurse. As he is responsible for the supervision of the village health worker, he has been compelled to improve his knowledge and to become more involved; he becomes a trainer instead of the simple dispenser of drugs that he was previously.

The rate of extension of the scheme is slow in view of the limited financial resources and of the scarcity of auxiliary personnel working at the supervisory level. Ideally two auxiliary nurses should staff each dispensary in order to supervise the village health workers regularly - once or even twice a month - and meanwhile to keep the dispensary operating for patients living in its neighbourhood.

The slow extension of the scheme requires drastic changes to be introduced in the strategy for the development of health services as a whole. Manpower training and the adequate use of financial resources so that they do not only go to existing health establishments are still problems to be solved.

Training of traditional birth attenuants (TBA)

Traditionally, the role of the TBA was strictly limited to burying the placenta and giving the most elementary care to the child and mother.

Surveys carried out locally have shown that in the Maradi Province, though TBAs are assisting, a high mortality rate exists among women and children during and after delivery as a result of either pregnancy complications or neglected or untreated infections.

In order to improve this situation and again through joint efforts from the rural development, education and health services, it was accepted that the performance of TBAs should be improved by some training, with a view to more active and efficient involvement even before the delivery, using more hygienic standards, referring complicated cases to health centres or maternity hospitals and registering the newborn. Selection of TBAs for training is made on the basis of principles similar to those applied for the selection of village health workers. The TBAs are trained for 15 days in the maternity ward of a health centre or in the district rural hospital.

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The training is essentially practical and relates to all phases of the delivery (including prenatal and postnatal care). The objectives of the training are: to decrease the infant mortality; to improve the standards of hygiene during the delivery itself; to educate the mother in the application of better nutrition practices during the pregnancy, as well as during the weaning period; to ensure some statistical recording of the births; and thus to create a way of compensating for the scarcity of maternity homes.

At the end of the course the knowledge acquired is tested and only the most capable TBAs are selected for appointment. They then receive a basic UNICEF midwifery kit with some drugs and equipment. Supervision of and the supply of drugs to the trained TBA (TTBA) are carried out generally once a month by the nurse in charge of the nearest dispensary. The cost of training the TBA is about F CFA 4620 (US$ 21), equipment and supplies included. UNICEF has so far borne the cost of most of this training.

In practice, and for the time being, the work of the TTBA begins at delivery. The striking feature has been the improvement of the hygienic conditions in which the delivery takes place. Another aspect of the TTBA's role is seen in the gradual change of traditional practices during the weaning period.

Although the TBA is in principle a voluntary worker, it is customary for her to receive a gift after each delivery. The size of the gift depends on local conditions and traditions.

Achievements and prospects

In 1973, 1071 deliveries were assisted by the 241 TTBAs working in the Maradi area. This represents 28% of all deliveries recorded in the department. The number of referrals totalled 65. Most striking is the dramatic improvement of the hygienic conditions in which deliveries take place. In addition, some TTBAs already play a more active role in the prenatal and postnatal consultations organized in a number of dispensaries or maternity units.

For 1974, it is planned to train 91 TBAs (covering 32 villages). An effort will be made to train a selection of younger but nevertheless acceptable women who will presumably have a higher capacity for assimilation; and to widen the scope of the activities of the TTBAs.

The extension of the TTBA scheme is also related to the supervisory capacity of the dispensaries and health centres. A considerable increase in assistance and support may be obtained if the means at the disposal of the provincial mobile teams could be increased or mobile teams created at the district level.

Health education and nutritional health education

Again through the joint efforts of the rural development, health and education services, a provincial workshop has been set up, which provides elementary support to the village health workers and the TTBAs (e.g. flannelgraphs, booklets) for health and nutritional health education activities directly related to their respective functions. Teachers and other professional personnel also receive this equipment and participate in the same activities. Nutritional health education covers mainly the weaning problems for which locally available cheap solutions are needed.

Replicability of the scheme

The village health workers with their village pharmacies and the trained traditional birth attendant schemes have been briefly described. The achievements are the results of intersectoral teamwork leading to the motivation and active participation of the villagers

in health protective activities. The extension of the schemes to other departments of the Republic of Niger is proposed and a national evaluation of their development is under consideration.

The replicability of the scheme will mainly depend on how a number of avoidable or at least reducible constraints can be overcome, among which motivation of the decision-makers at intermediate and at central level is not the least. Manpower needs are still increasing and other handicaps to the development of the system are financial. Transport, equipment, supplies and drugs are badly needed, although UNICEF actively helps in this area. Experience has demonstrated that the scheme promises a better coverage of the rural population provided that it is programmed realistically and rationally in close relationship to the local conditions in each village. Continuous involvement of multisectoral service teams specially designed to assist the communities in their development is also required.

ANNEX X

AYURVEDIC MEDICINE

I. Introduction

Throughout the ages, man has devised ways and means of caring for the sick in the community that have depended mainly on the community's notions of the origins and causes of disease.

Until the discovery of bacteria, illness was attributed to supernatural causes and regarded as evidence of the displeasure of ancestral gods and evil spirits or as the effect of black magic. Such beliefs are still held by many less sophisticated communities in developing countries and indigenous healers therefore undertake elaborate exorcising rituals on behalf of the sick and mentally afflicted. Among such communities, diseases have been classified into three broad categories - those curable by indigenous medicine, those curable by modern medicine, and those that are self-limiting and not affected by either system.

There is therefore no vacuum anywhere in regard to health care, but such care, though psychologically supportive to the individual, may be largely ineffective or even harmful through lack of medical and scientific knowledge, skills, and technical resources.

However, certain aspects of the classical clinical approach to modern scientific medicine, particularly in the developing countries, are biased, incomplete and, indeed, potentially harmful to some communities because they ignore sociocultural factors.

In this respect, the great traditions of Arabic, Chinese and Hindu medicine are important; an analysis of these traditions is needed for medical sociology and is relevant to the practical problem of improving health care, in particular of providing total health care coverage for any population group.

In 1948, the report of the Committee on Indigenous Systems of Medicine in India (which had been set up in 1946) was published. The inquiry was concerned with Ayurveda or Hindu medicine (including Sidha) and the Unani Tibbi indigenous systems of medicine. The report dealt mainly with Ayurveda, which it considered native to India. Ayurveda is reputed to have been practised for over 3000 years, its history being divided into four periods - (1) Vedic; (2) original research and classical; (3) the compilation of Rasa Tantras and Sidhas; (4) stagnation and then recompilation. Ayurveda was at its height during the second and third periods. There were treatises on medicine, anatomy, gynaecology, obstetrics (including Caesarean section and destructive operations on the fetus) and surgery (including lithotomy and rhinoplasty). Anatomical dissections were undertaken. Persons suffering from infectious diseases were isolated. Immunity was known to the ancient Hindus and inhalation anaesthia was used. The principles of dietetics were appreciated and utilized in the care of the sick.

At the beginning of the Christian era Ayurveda had spread far and wide, influencing the systems of medicine in Arabia, Egypt, Greece and Rome. Surgery was practised and couching of cataract, bonesetting, and surgery of those wounded in battle were well established. The advent of Moslem rule brought with it the Unani or Arabic system of practice, and both were utilized in India for the benefit of the people. The introduction of Western European surgery followed British rule in India and tended to weaken Ayurvedic practice. The indigenous systems had become static by the end of the 19th century, and had fallen mainly into the hands of untrained persons without the competence to practise Ayurvedic medicine.

The report of the Committee stated that, although both Ayurveda and Unani systems had become static, it was possible that if these systems were investigated and properly studied they could make many valuable contributions to modern medical science.

In 1827 classes in Ayurvedic medicine were begun at the Government Sanskrit College, Calcutta. These classes were discontinued in 1835 and the Calcutta Medical College of Western

Medicine was established. As with the colonial medical service in its formative years, the training and services provided were designed essentially for the expatriate ruling community. This engendered a reaction, particularly among Indian nationalists, and when sporadic attempts were made to rehabilitate the Ayurvedic and Unani systems, provincial governments showed interest in their revival. In 1920 the Indian National Congress passed a resolution to the effect that, having regard to the widely prevalent and generally accepted utility of the Ayurvedic and Unani systems of medicine in India, earnest efforts should be made by the people of India to popularize schools, colleges, and hospitals for instruction and treatment in accordance with these indigenous systems.

Some provincial and state governments interested themselves in the use of Indian medicine for rural medical relief. Schools and colleges of Indian medicine were opened in Madras, Bombay, Delhi, Bengal, and other states to train competent practitioners of Indian medicine with a good working knowledge of Western medicine, so that they could render comprehensive medical service to the rural population. It was also hoped to promote research and eventually to integrate the Indian and modern scientific systems, and the health team would include doctors, physical training experts, sanitarians, physiotherapists, nurses and midwives.

The Committee expressed the view that, as all different systems - Ayurveda, Unani, Western medicine, homeopathy, etc. - had as prime objectives the maintenance of health and the prevention and cure of disease, they should all be properly investigated for the benefit of humanity and integrated into a single health care system. Separate systems of Indian and modern medicine were not envisaged in the report, although the available information indicated that Indian medicine, though relatively static, still gave medical relief to over 80% of the population.

As a result of recommendations of the 1948 and subsequent committees, the Central Council of Indian Medicine was constituted by the Government of India in 1971. The Council's main functions include (a) the recognition of qualifications in Indian medicine, (b) the prescription of minimum standards of education in Indian medicine, and (c) the maintenance of a central register of practitioners. The Council has worked quickly and has already established minimum standards of undergraduate education and introduced a curriculum for adoption by the college of Indian medicine. Minimum standards and curricula for postgraduate education have also been established.

II. Science and philosophy of Ayurvedic medicine

1. Ancient method of study

The system of ancient Indian medicine - Ayurveda - had been developed against the rich background of social, cultural and philosophical principles prevailing in India between the period 600 B.C. to A.D. 700. The three great authors, Charaka, Sushruta, and Vagbhata were much influenced by the Sankhya and Yoga philosophies of that time. These authors discussed not only bodily illnesses but also the different psychosomatic problems in great detail during health and disease. The philosophy of Ayurveda can help us to understand the different psychosomatic disorders occurring in man and also the methods adopted to manage them.

In the field of medical education, elaborate methods were evolved for the selection of students, codes of conduct, methods of training, and examinations. A high standard of social behaviour prevailed among practitioners, with strict discipline and codes of behaviour towards patients.

Basic elements

According to the principles of Ayurveda, the human being is a miniature of the universe, and likewise consists of five gross elements - earth, water, fire, air, and the ethereal parts

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of the sky. However, in a human body life does not depend only on those five bodily components, but also on the presence of normally functioning sense organs and of the mind and the soul. Therefore, according to Ayurveda, if one wants to study medicine, one has to understand man as a whole and appreciate his psychosomatic constitution.

According to Ayurveda, all bodily structures and functions are controlled by the three humours - Vata, Pitha and Kapha. In each individual one of the three humours is predominant, thus giving rise to a specific type of psychosomatic constitution. Human beings inherit body constitution genetically from their parents and, depending upon the predominance of a particular humour at the time of conception, have a predominance of one humour in the body. Though body constitution can be influenced to a certain extent by the physical and psychological environment, it remains essentially the same throughout the individual's lifetime.

In Ayurveda three main types of body constitution have been described, depending upon the predominance of the humours; the three types correspond to the ectomorphic, mesomorphic, and endormorphic types of constitution described by Sheldon. In addition to these three main types of body constitution there can be combinations of two humours in one person and also a balance of all three humours in some people, thus bringing the total number of types of body constitution to seven.

The main characteristics of these three types of constitution described in Ayurveda are as follows:-

Vata constitution (ectomorphic, neurotropic, or acetylcholine-predominant). A person with this constitution usually has a thin body and a very labile temperament. He normally has a quick response to stimuli and frequently moves his eyes, jaws, tongue, head, shoulders, hands, and feet without any definite purpose. He is very talkative and is quickly affected by fear, anger, and likes and dislikes. He is quick to grasp and also to forget facts. The hair on his head, face, and body is thick and rough. He usually has rough nails, teeth, hands, and feet. Such persons are more likely to develop functional disorders such as excessive nervousness, insomnia, tremors, and stress disorders such as peptic ulcer and ulcerative colitis.

Pitha constitution (mesomorphic, or catecholamine-predominant). A man with this constitution has a moderately well-built muscular body and is courageous and strong. He eats well and performs physical work diligently. He usually has scanty soft hair on the head, face, and body and develops baldness at an early age. On slight provocation he usually develops symptoms referable to the circulatory system, such as rapid pulse, a sharp rise in blood pressure, palpitations or other cardiac symptoms. These persons are likely at a relatively early age to develop hypertension and coronary thrombosis on exposure to stress.

Kapha constitution (endomorph, histamine secretors). A man with this constitution usually has a bulky and heavy body with smooth rounded face and limbs. He is usually slow in action and speech. He is also slow in his gait, talk and in all his undertakings, and is slow to change in mood. He normally has a good appetite and enjoys his meals. He is usually susceptible to diabetes mellitus and allergic manifestations such as asthma, rhinitis, and eczema. He is also likely to develop arthritis and fibrositis which can make him an invalid at a relatively early age. He is not excitable and rarely becomes angry and irritable.

In addition to these three main types of constitution, there can be combinations of two of the types in one person if two of the three humours are predominant. Such people will show the mixture of the above qualities depending upon which humours are predominant.

The disease process

According to Ayurveda, illness occurs if there is any derangement in the body humours, such as Vata, Pitha, and Kapha, or in the psychic factors, such as Satwe, Rajas, and Tamas, caused either by excessive or inadequate interactions.

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The activity of the three humours of the body may increase or decrease when they are acted upon by various predisposing factors. In the first stage, an excess of the humours is produced at the sites of production in different parts of the body. In the second stage the accumulated humours spread in the body. In the third stage they move, alone or jointly, throughout the body and cause the systemic symptoms of the disease. In the fourth stage the humours become localized in some organ or part of the body and after localization produce specific symptoms depending upon the structure and function of the organs or tissues affected. In the fifth stage there is overt manifestation of the disease in a given organ, and in the sixth stage either the disease process resolves in a particular organ or forms an ulcerative lesion through which all the vitiated humours are evacuated. At this stage the entire disease process is usually terminated; otherwise a chronic inflammatory process ensues.

The main purpose of understanding the development of the disease process is to plan appropriate treatment by the elimination process, such as giving emetics or purgatives. Where this is not feasible, the vitiated humours should be neutralized by the process of oxidation or conjugation into relatively non-toxic products, which are then eliminated through the urine or faeces.

In epidemic diseases such as severe smallpox, the constitution of the body is unable to play any part in counteracting the massive infection. Here the disease process is dominant and, in such a state, when the individual body constitution is put out of action, very little individual variation occurs in the process and course of the disease. In fact, there will be some uniformity with regard to clinical features and laboratory findings, as is seen in various eruptive fevers. However, in chronic diseases the individual constitutions will be able to demonstrate resistance, depending upon their strength, and there will therefore be variation in the presentation and course of the disease.

III. Practice of Ayurvedic medicine

There is still considerable deficiency in our knowledge with regard to the psychosomatic and stress disorders that are rapidly becoming more prevalent. As a result, it has not been possible to prevent the growing incidence of such disorders as coronary thrombosis, hypertension and peptic ulcer, nor to control them in an effective manner. There is, therefore, an obvious need to study the problem from a different angle such as the integrated psychosomatic approach as described in Ayurveda.

In Ayurveda, as in modern medicine, there are two major components of medical practice - (a) preventive and (b) curative.

1. Preventive measures

The preventive aspects of practice of Ayurveda consist of the following three components: (i) personal and social hygiene, (ii) the use of rejuvenating measures to prevent aging and decay, (iii) practice of Yoga to provide tranquillity of mind and complete physical relaxation.

(i) Personal and social hygiene: In Ayurveda a regulated daily life of getting up early in the morning is recommended with the performance of certain prescribed routines to preserve good physical and mental health. After evacuation of the bowels and cleaning the teeth, Yoga exercises should be performed every day. This is followed by a bath, prayers, regulated diet, and then work, adequate rest, and sleep. These prescribed daily routines are modified and adjusted depending upon the country, the climatic conditions, and the environment in which the person is living. In addition, social behaviour should be such as not to interfere with the physical or mental health of others.

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(ii) Rejuventating measures: Two methods are described in Ayurveda for this purpose - "Rasayana" or rejuvenation and "Vajukarana" or the use of aphrodisiacs. To achieve both these aims, several drugs and other measures have been described. The main aims of Rasayana therapy are (1) prevention of aging and increasing the longevity of life, (2) improvement of memory and intelligence, (3) promotion of immunity and bodily resistance to disease and decay, (4) giving lustre and vitality to the body, and (5) maintenance of optimum strength of the body and sense organs.

There are many well-known herbs which are either given singly or in combination for prolonged periods to provide these desired effects. In addition to the use of these drugs, certain exercises and other measures are also prescribed to help maintain good bodily and mental health. The various Yoga practices are commonly used for the purpose.

(iii) Practice of Yoga: The word "Yoga" means "union" and the exponents of Yoga claim that by continuous practice of Yoga one can maintain a perfect union of body, mind and soul, leading to complete tranquillity and peace.

In order to suit the convenience of the individual, a certain selection of Yoga practices should be performed, for example a few postural exercises, a few breathing exercises, and then some type of meditation. Such a selection of Yoga practices does not take more than 30 minutes and therefore can be done either in the morning or evening, as convenient.

In a recent study conducted on volunteers who were subjected to various postural and breathing exercises for six months, it was found that there was a significant increase in vital capacity and a decrease in the rate of respiration and heart beat per minute. These volunteers also showed significant decreases in body weight, blood sugar, and blood cholesterol at the end of the six months' experimental period. The rate of urinary excretion of corticoids and testosterone was increased. They also demonstrated an improved memory quotient and reduced neuroticism.

The volunteers who practised meditatation showed a significant reduction in plasma cortisol, urinary corticoids, and uninary nitrogen excretion. At the same time, these volunteers showed significant increases in the blood levels of the different neurohumours and related enzymes. These findings indicate that after meditation the subjects were physically stable and resilient, and mentally very active. The practice of Yoga may prove an effective method of keeping fit, both physically and mentally.

It has also been observed that the regular practice of Yoga helps patients to overcome the early stages of asthma, diabetes mellitus, thyrotoxicosis, and hypertension.

2. Curative treatment in Ayurveda

There are four main curative aspects of practice in Ayurvedic medicine: (i) administration of medicine internally, (ii) application of medicinal preparations externally, (iii) surgical measures, and (iv) treatment by psychosomatic measures.

(i) Internal medicine and therapeutics. The internal administration of drugs plays an important part in treatment. The drugs are used mainly to eliminate the causative factors, including morbid humours, from the body, by causing vomiting or purging, and different types of enemata and inhalations are used. These eliminating processes are carried out as far as possible before starting any prolonged curative drug therapy, rejuvenating therapy, or even surgical treatment.

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An example of treatment according to Ayurvedic principles is that for rheumatoid arthritis. Here all the bodily humours become vitiated and settle in the joints, big and small. In order to counteract this process, various eliminating procedures are carried out, followed by specific drug therapy, e.g., with the gum guggulu and its preparations.

The second type of treatment is aimed at neutralizing the morbid humours by giving appropriate drugs, diet, and physiotherapy. For this purpose Ayurveda describes a large number of herbal, mineral, and biological preparations to be used singly or in various combinations, depending upon their pharmacodynamic properties. An example of this type of treatment is seen in the management of hemiplegia following a cerebrovascular accident. For such patients Ayurvedic physicians give specific drugs to stimulate regeneration of the peripheral nerves. Purified nux vomica and other drugs with similar properties are given for prolonged periods. The preparations are mostly in the form of powders, liquid extracts, tinctures, decoctions, and tablets. In recent years many attempts have been made to standardize the preparation of these drugs and also to isolate active principles from them. Rauwolfia serpentina is one such drug whose active principles have been extensively used all over the world. Many other similar drugs have been investigated in various centres, and no doubt more useful drugs will be discovered in the near future.

In addition to drug treatments, Ayurveda attaches great importance to diet. A large variety of dietetic preparations have been found extremely valuable for the maintenance of the nutritional status of the patients during their illness. For example, after the onset of acute gastroenteritis in children, the modern physician would advise immediate fluid therapy parenterally. Ayurvedic physicians would, however, try to maintain the fluid balance of these children by carefully planning the oral fluid intake and administering appropriate antiemetic and antidiarrhoeal treatment. They advise the intake of specific fluids such as whey water, boiled rice water, and fresh coconut water. Similarly they recommend specific fruit juices with astringent properties, such as apple juice and pomegranate juice. The intake of milk is forbidden in such cases.

In this way Ayurveda describes treatments for all types of acute and chronic illnesses. The current Ayurvedic treatments appear to be very effective in cases of chronic metabolic diseases such as diabetes mellitus, atherosclerosis, and lipid storage diseases. Similarly, arthritis of various types, different types of gastrointestinal and urinary tract disease, asthma, allergy, some of the specific skin diseases, chronic neurological diseases, and some mental ailments are also amenable to Ayurvedic treatment. Many patients with diseases that are not readily amenable to modern treatments have benefited greatly from the use of Ayurvedic therapeutic measures.

On the other hand, in Ayurveda there is no effective method for managing such acute emergencies as perforated peptic ulcer. Here the responsibility of the Ayurvedic physician is to make a correct diagnosis and refer the patient to a specialist for the necessary treatment. It is essential that Ayurvedic physicians should be competent enough to differentiate these acute emergencies and to take prompt action.

(ii) Medicines for external application. In addition to the administration of internal medicines, Ayurveda prescribes a large number of medicines for external use in the form of pastes, medicated oils for massage, medicated baths, gargles, and powders. The efficacy of medicated oils for treating some diseases of the joints and also some neuromuscular disorders is well known.

The treatment of burns with specific external applications is also well established. In cases of early superficial burns, ointments prepared from Papaya juice are applied to produce a gradual débridement of devitalized and dead tissues. When this process is completed and the healthy granulation tissues appear, the local application of medicated ghee prepared from the jati flower promotes healing. In extensive burns, such treatment is supplemented with skin grafting to replace lost tissue.

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(iii) Surgical treatment. Ayurveda describes in great detail various surgical conditions and their management. These include different types of fracture and the principles of their management and various operative and palliative treatments for surgical conditions such as urinary stones, piles, fistulae, goitre, lymphadenitis, hernea, and hydrocele. Many plastic operations such as rhinoplasty and otoplasty have been described in detail; likewise ambulatory treatment of fistulous in ano with corrosive threads in preference to extensive excision of fistulous tracks, which requires confinement to bed for several days and involves the risk of secondary infection.

(iv) Psychosomatic treatment. Although treatment has been described for different diseases, the Ayurveda physician is required to individualize therapy with regard to drug components and ingredients, dosage, diet, and rest according to the psychosomatic constitution of the individual patient and also the predominance of vitiated humours in the disease process. In cases of psychiatric ailment, certain prayers and offerings are made to the gods in order to allay the harmful effects of evil spirits on the patients and their families.

3. Status of Ayurvedic practitioners

In India there are at present about 50 000 institutionally qualified practitioners and about 150 000 non-institutionally qualified registered practitioners of Indian medicine. The first category of practitioners also employ modern drugs, mostly for acute conditions. Ayurvedic drugs are generally preferred by people living in rural communities. Most Ayurvedic physicians are local residents and remain very close to the people socially and culturally. They are thus able to gain the full confidence of the community; in spite of all the modern advances in medicine Ayurvedic physicians remain very popular and highly respected, especially in rural India.

There is a wide divergence of standards of payment for the services rendered by these Ayurvedic physicians, varying from Rs 2 to Rs 10 (US$ 0.25 to 1.2) per visit, depending upon the type of training the practitioner has had. Most of the traditionally trained Ayurvedic physicians have had their basic education in Sanskrit before undertaking Ayurveda. The pure Ayurvedic physicians undergo training in an institution for 4 years after matriculation, whereas the integrated Ayurvedic graduates undergo 4-1/2-5 years' training after the intermediate B.Sc. examination, just as modern medical graduates do.

About 10% of those qualified and registered as Ayurvedic physicians seek government service and work in rural Ayurvedic dispensaries. However, in most states their salary and status are much lower than those of modern medical graduates. Many Ayurvedic physicians therefore prefer to go into private practice in the rural areas.

The state and central governments support about 9000 Ayurvedic dispensaries and 195 hospitals that offer services to the people mainly according to the Indian system of medicine. They are usually manned by institutionally trained and qualified Ayurvedic physicians.

Ayurvedic practitioners are classified into four main categories:

A. Fully integrated Ayurvedic medical graduates who have studied both the modern and Ayurvedic systems of medicine and expect equal status in all respects with modern medical graduates. There are about 7000 integrated graduates in India.

B. Pure Ayurvedic physicians with an elementary knowledge of modern medicine. After matriculation they usually undergo 4 years' training at one of the Ayurvedic colleges. They treat their patients mostly with Ayurvedic drugs, but in emergencies they can also use modern drugs. There are about 43 000 pure Ayurvedic physicians in the country, mostly engaged in private practice in smaller rural communities.

C. There are also about 150 000 traditionally trained Ayurvedic physicians who have not attended any Ayurvedic institution in the country and have acquired their qualification by taking various examinations conducted by Ayurvedic colleges. They obtain their practical experience through apprenticeship with some well-known Ayurvedic physician for a period of 4-5 years. Such men with diplomas are registered separately and allowed to practice only Ayurvedic medicine. There is no doubt that if these practitioners were given some additional training in modern medical and public health procedures they could be utilized more effectively for delivering health care to the rural communities.

D. Finally, there are about 200 000 Ayurvedic practitioners in the villages who have not acquired any qualification and are not registered with any state board of Indian medicine as Ayurvedic practitioners. These are people who have acquired their knowledge and experience from the senior members of their own families or from other Ayurvedic practitioners under whom they have worked for some time. Because of their poor educational background it is unrealistic to consider them for possible integration into the general health services. In selected cases, however, such reorientation might be possible and worth while. The traditional birth attendant or dai might be included in this category.

Review of training curriculum

Nearly 100 Ayurvedic colleges have been established in India and have so far trained some 50 000 institutionally qualified Ayurvedic physicians. Most of these people have not only a good basic knowledge of Ayurvedic medicine but also an adequate practical knowledge of modern medical science. If additional short-term refresher courses were provided for these practitioners, they could become eminently suited to meet the immediate needs of rural populations by providing primary medical and health care.

It is clear that the ultimate solution to the health problems of the developing nations is a fully integrated type of training that includes the essential principles of both indigenous systems of medicine and modern medical science, so that practitioners can serve the rural populations with efficiency and understanding and at relatively low cost.

Postgraduate training

The following is a description of the integrated postgraduate medical education system developed at the Banaras Hindu University.

The College of Ayurveda was established at the University as early as 1927 and initiated a 5-year integrated training programme in Indian medicine and modern medicine and surgery leading to the award of the degree A.M.S., and later the A.B.M.S. (Ayurveda Bachelor of Medicine and Surgery). A training programme in all fields of medical science was developed, but in 1960 the undergraduate course in Ayurveda was disconintued on account of the state and central governments' refusal to recognize A.B.M.S. as equivalent to the medical degree of M.B., B.S. However, the importance of Indian medicine was fully appreciated and a postgraduate training course in Indian Medicine was initiated in 1963 at the College of Medical Sciences of the Banaras Hindu University; three years later the Postgraduate Institute of Indian Medicine was founded.

A three-year postgraduate course leading to a Doctorate in Ayurvedic Medicine (D.Ay.M.) was established. Admission to this course is open to graduates in both Ayurvedic and modern medicine. In the first year after graduation in Ayurveda (A.B.M.S.) the doctor has to undergo training in applied aspects of modern medical subjects, while the graduate in modern medicine (M.B., B.S.) has to study the basic principles of Ayurveda. The next two years are devoted to studies and clinical and laboratory research in any one of the five Ayurvedic specialties. At the end of the two-year period the candidate submits a thesis and is examined in two papers on the subject of specialization. In addition, one paper is based on classical Ayurvedic texts and another on an allied modern subject. Sucessful students are awarded the D.Ay.M.

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This training programme affords students the opportunity to acquire knowledge in both Indian and modern medicine and enables them also to undertake original scientific investigations with analysis of research findings.

Since 1966 a course for the Ph.D. degree in Ayurveda has been developed with a view to promoting advanced research in Ayurvedic subjects.

The Indian Medicine Unit of the Institute of Medical Sciences comprises the following six departments:

1. Principles of Ayurveda
2. Dravyaguna (properties of medicinal substances, materia medica, pharmacology)
3. Kaya Chikitsa (therapeutics, general medicine)
4. Shalaya Shalkya (surgery, major and minor)
5. Prasuti Tantra (obstetrics and gynaecology)
6. Medicinal chemistry.

The University also runs a regular course in modern medicine for the training of students for the M.B., B.S., M.D., and M.S. qualifications. Admission requirements are the same as for other medical colleges and at undergraduate level the students undertake a five-year course including Ayurvedic medicine and surgery followed by a six-month internship. The general opinion is that the M.B., B.S. course should include the essential features of Ayurvedic medicine in order to equip practitioners more fully for health work in India.

Research

The need to conduct applied research is evident, and in this field the Institute has made several contributions to knowledge on the therapeutic value of Ayurvedic drugs, by determining their mode of action, isolating their active principles, and assessing the effective dosage and toxicity. An anabolic steroid has been isolated from C. quadrangularis and has been studied extensively to determine its role in fracture healing. A catabolic steroid has been isolated that is said to be highly effective in the prevention and treatment of hyperlipidaemia and its complications, including atherosclerosis and coronary thrombosis. The herbal substances, jati ghrit and kshar-sutra have also been standardized for wound healing and for the treatment of fistula-in-ano, by means of suitably impregnated sutures passed through the fistular tract. Other drugs that have been studied include Picrorrhiza kurroa for the treatment of liver diseases, Allium sativum for the control of hypercholesterolaemia and heart diseases, Semecarpus anacardium Bhallatak for worm infestations and arthritis, tambool for heart diseases, and punarnava for urinary diseases.

In addition there is also an urgent need for conducting research into the practice of Yoga, which has generated worldwide interest in recent years. As already stated, different Yoga practices help not only to maintain good positive bodily health but also to maintain good mental health, peace of mind, and happiness.

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In order to determine the best method of providing health care to the rural people efficiently and at low cost, it will be necessary to establish a few pilot research schemes in different parts of the country. Such operational research will have to be designed realistically, using available local resources including health manpower, and with the minimum of external input.

Field visits

A visit was made to a private clinic in Narayanpur, some 50 km outside Varanasi. The clinic was operated by an Ayurvedic couple, both of whom are graduates of the Banaras Hindu University. The senior partner specializes in ophthalmology, undertakes refractions, and dispenses lens and spectacle frames. The private nursing home has 10 beds with a small but well-equipped operating theatre and the cases treated include entropion, pterygium, cataract, rectal fistula, haemorrhoids, hernia, and open fractures. The wife is responsible for minor obstetric and gynaecological procedures such as forceps delivery, dilatation and curettage, episiotomy, and repair. Another Ayurvedic practitioner in the same village also has an active outpatient clinic and specializes in dentistry.

A visit was also made to a government dispensary in a suburb of Varanasi. The team leader is an Ayurvedic practitioner. The dispensary was being moved into more spacious quarters and four beds had been included for the treatment and observation of patients. The dispensary appeared to be well organized and the small pharmacy store contained both Ayurvedic and modern therapeutic agents, including antibiotics. Infectious diseases were treated and notified to the public health authorities. Acute medical and surgical emergencies beyond the scope of the local facilities were referred to the central hospital for treatment and subsequently returned to the dispensary for follow-up and ambulatory therapy.

In a survey of indigenous medical practitioners in the rural areas of five Indian states in 1973, all persons practising any system of curative medicine and without any recognized qualifications in modern medicine were interviewed. It was reported that only 7.4% of the practitioners had obtained some institutional training and qualifications and that 65.6% were unqualified and classified as "quacks" or "unfit to practise". The remainder had followed a correspondence course. Many were prescribing allopathic medicines and had no training in modern medicine. The tendency was for these practitioners to be located in the large villages; the majority of the smaller villages with a population of 3000 or less had no resident practitioner. The coverage was between 5.5 and 9.8 indigenous practitioners per 10 000 of the rural populations surveyed.

In view of the very limited time available, the mission was not able to study the unfavourable situation referred to above. Although the rural health coverage seems adequate, there are serious doubts regarding the effectiveness of these indigenous practitioners classified mainly as "quacks" and unfit to practise.

Conclusions

Official recognition of indigenous systems by the governments of the countries in which the practice is established would no doubt help in improving the quality of practitioners and promoting knowledge of the system.

Surveys of indigenous practices indicate that there is an urgent need for additional training in order to improve their efficiency and usefulness. The training programmes should be structured to meet the special needs of the different categories of indigenous practitioner, and priority should be given to orientation in community and public health practice.

Practitioners of modern medicine and undergraduate students also require some orientation in indigenous systems where relevant, in order to improve their knowledge and bring about the necessary changes in attitude.

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The studies outlined above are considered essential prerequisites for the integration of indigenous systems into government-sponsored health services.

In India, an estimated 400 000 indigenous practitioners are functioning - mostly in the rural areas - and could probably be developed and utilized to provide full coverage.

The development of mass services or total health coverage for rural communities appears more realistic than once seemed possible.

ANNEX XI

USE OF TWO-WAY RADIO IN DELIVERY OF HEALTH SERVICES IN NORTHERN NIGERIA

Introduction and problem

Improved communication through two-way radio will contribute towards solving some health service problems in the rural areas of most developing countries. These problems include: lack of consultation and referral facilities; poor supervision of the staff; lack of further professional training; feelings of isolation and neglect among the staff in outlying posts; inadequate supplies of drugs and other requirements; rigid or restricted transport facilities; and insufficient information about needs for health services as well as about the ability of dispensaries and other outlying posts to meet them.

The two-way radio system in Northern Nigeria is only one of the possible systems; similar schemes are in effect in other African countries as well as in other continents. Many of the two-way radio schemes are accompanied by a flying doctor service, since the former is obviously a prerequisite of the latter. This history of two-way radios goes back to the mid-1920s, when a scheme was started as a component of a flying doctor service in Australia.

The emphasis was placed on the Nigerian scheme for two main reasons. First, it represents an experiment with a definite government interest from the beginning (it was later run by the Government), while most of the other two-way radio schemes are financed through voluntary funds or foreign aid. Second, the Nigerian scheme was operated on scarce resources, thus reflecting the prevailing situation in most developing countries.

The Federal Republic of Nigeria, which had a population of about 80 million in November 1973, is politically divided into 12 states. The North-Western State is one of the largest states in Nigeria, and at the same time one of the poorest and least developed. Its area of 16 900 square kilometres contained a population of approximately 7 232 000 at the end of 1972, of whom about half were under 15 years of age. About 85% lived in rural areas, the state being predominantly agricultural.

Basic medical care at the village level is provided in the North-Western State by dispensaries, the number of which in 1973 was 129. They are staffed by a trained (male) medical auxiliary and two untrained staff members and serve mainly curative functions. They are administered and supervised by the local authorities, but the State Ministry of Health has a statutory right of technical supervision over them. Supplies are provided by the local authorities from the State Medical Store.

In 1973, there was a population of about 50 000 per dispensary, including dispensaries run by the missions, and it has been estimated that an additional 360 dispensaries in the State by 1980 would not result in an even distribution in rural areas, so making specific arrangements to reach the rest of the population still necessary.

The health institutions may be far from the supervisory institution and, although most outlying dispensaries can be reached by a vehicle of the Land Rover type, travel, even by car, to the institutions to be supervised by one supervisor takes days. This greatly restricts any kind of regular communication with more outlying health institutions.

Description of the two-way radio scheme

Two-way radio communication was initiated in 1963 as a component of a flying doctor service in Northern Nigeria. The base was located at the Gusau Central Hospital and radio links were made with 26 stations (including a few district hospitals and a number of outlying dispensaries) which were equipped with pedal-operated transceivers. The network of dispensaries and hospitals covered a relatively large area, mostly in the North-Western State, the distance between the stations farthest apart being more than 600 kilometres. The dispensaries and hospitals were provided with landing strips for the use of small aircraft.

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The two-way radios were mostly used for advising on and supervising the clinical work of the dispensary assistants and for consultations on difficult cases, and all such cases were also treated as teaching cases to improve the diagnostic and other standards of the dispensary. In emergencies an aircraft or other transport was asked for, to get the doctor to the spot or to move the patient to the hospital. In the absence of other telecommunication means, two-way radios were used to inform headquarters about any shortage of supplies in the dispensaries and about possible epidemics in the area.

The base station was open during normal office hours and for certain periods on Sundays and holidays. No frequency suitable for night time use was ever allocated. During these first five years a doctor was in charge and was available to deal with the calls. This ceased with the handover to the Government, and much of the technical and administrative difficulties leading to the virtual closure of the service resulted from the fact that no one was in a position of overall responsibility.

In addition to contacts between the base station and the outpost radios, direct communication between outpost radios was possible. Easy and frequent contact was made through the base station as this was essential to the adequate control and discipline without which no radio can successfully operate. During doctors' visits to outposts they normally spoke direct to other dispensary attendants with problems.

The project at the beginning was entirely funded through foreign donations, which also made it possible to purchase two small aircraft for the flying component. The latter component had to be discontinued later owing to technical and financial difficulties, after which the service continued as a two-way radio system only. After a few years it was handed over to the Government and continued as a Government-financed scheme.

During the early years the two-way radio system worked relatively well, but gradually the transceivers became out of date and maintenance caused great problems. By March 1974 only the base station and a few other transceivers were in working condition, but not in operation. The Government of the North-Western State of Nigeria, however, is considering the establishment of a radio network in the state using new modern transceivers.

Results of the two-way radio scheme

In spite of the fact that the network covered only a small number of the dispensaries in the region, including some of the most outlying ones, the two-way radio scheme had certain specific effects. These effects indicate the potential functions of a two-way radio network in other developing countries.

1. The system provided further training for the dispensary staff through regular consultation with the doctor. The professional competence, skill, and efficiency of the dispensary staff increased.

2. The system made it possible to supervise the work of the dispensary staff, e.g., by instructing them to devote more of their time to preventive work when curative supplies ran short.

3. The supply of drugs and dressings was improved, and the radio provided a means of utilizing the available supplies more efficiently, e.g., by indicating that an alternative drug could be used if the one proposed for use was out of stock.

4. Many patients, in the dispensaries as well as in the district hospitals, received better treatment than they would have had if the system had not existed.

5. In emergencies, better professional advice was available and often transport to hospital as well.

6. The possibility of direct consultation with a doctor improved the morale of the dispensary staff, and they did not feel themselves so isolated and neglected.

7. Epidemiological surveillance of larger areas was possible and, in outbreaks of epidemic disease, messages reached headquarters rapidly and mobile teams were instructed and quickly dispatched.

The two-way radio system, as applied in Northern Nigeria, seems to have strengthened the curative services more than preventive health work.

Evaluation of the scheme

No detailed figures are available for assessing the scheme in terms of the three basic criteria of coverage, utilization, and costs. It is, however, apparent that the improved communication with consultant doctors strengthened the health services provided by the outlying peripheral units and thus contributed towards improving the coverage of the services provided by them.

Applicability of two-way radios to health services

A two-way radio network is of especial value in one or more of the following conditions:

- in sparsely populated areas where there are great distances between the health posts
- in areas where transport is particularly difficult because of, for example, lack of roads and vehicles
- in the absence of adequate telecommunications, which may render the use of a radio network desirable even in more populated areas with a road network.

One possible measure is to employ the national broadcasting service for sending messages to health institutions, at least in emergencies. If certain times are reserved, messages can be transmitted to outlying districts, requesting a station, for example, to call headquarters.

Experience from the use of two-way radios in Northern Nigeria suggests that certain constraints have to be taken into account in planning and managing a radio network for health services. The most important are as follows:

1. The capital cost of the radio sets may be high when a complete network is established covering dispensaries and possibly other health facilities. The benefits of the radio network obviously depend on the coverage.

2. Training of the staff using the radios is needed and should include sufficient instruction about the use and maintenance of the sets.

3. The training of staff should also include a special terminology or a standard chart for describing the symptoms by radio. This may simplify communication and help in solving possible problems with language.

4. Regular as well as emergency servicing of the radio sets must be well organized. It is feasible to establish coordination among separate radio networks; assured communications are needed at all times, at least for policy and military security purposes, and their technicians might also be made available to the health network.

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5. There must be regular supervision of the radio network, with a built-in evaluation scheme to assess the efficiency of the system and the need for changes.

A radio network of more than a very few sets requires effective control and this is only achievable if the base station has a power sufficiently great compared with the outposts, remembering that the outposts are in the control of dispensary attendants and not people who have had long training as radio operators.

The cost of establishing a two-way radio network depends mainly on the number of radio sets, i.e., the number of health institutions to be covered by the radio network. In 1974, a high frequency radio with a range up to 1600 kilometres costs approximately $ 1800 with the necessary equipment. The price is somewhat lower for radios with a shorter range. The same type of radio can be used centrally and peripherally, though a more sophisticated type would be useful centrally. It has been estimated that about $ 1000 would cover the basic spare parts for 70 radios and that the minimum of repair tools and other materials to be held at the base would cost approximately $ 6000.

The recurrent costs of maintaining a two-way radio network also depend to a large extent on the number of radio sets, although some (e.g., the salary of the radio engineer who would be required and his assistant) cannot be avoided even with a small number of sets.

It is difficult to measure by cost-benefit analysis the impact of a two-way radio scheme on the health status of the population. When the scheme is properly managed and the sets are properly used, recurrent costs may be assumed to play a smaller role than capital costs.