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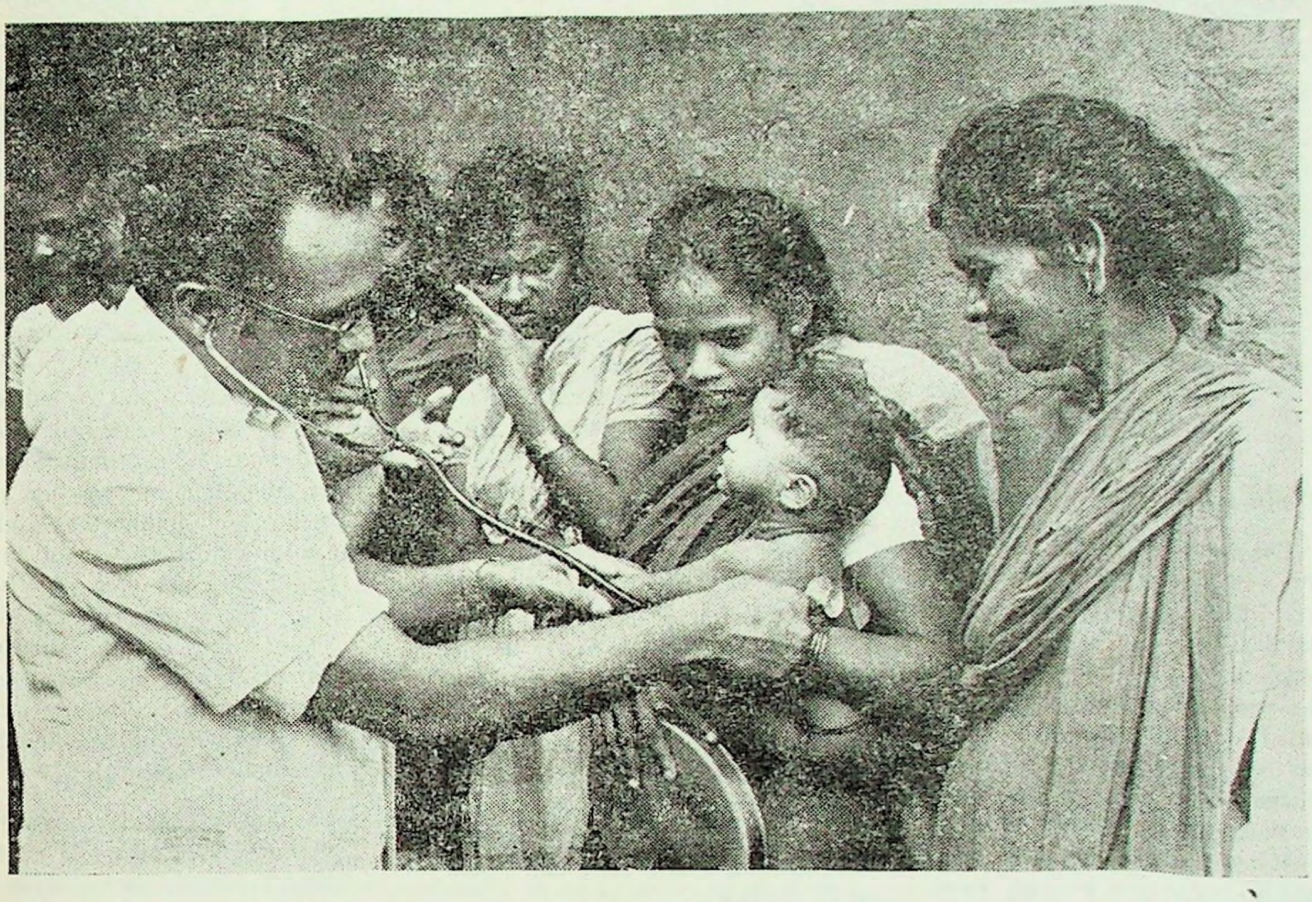


DELIVERY OF HEALTH CARE THROUGH COOPERATIVES

DR A.R. CHAURASIA

There is a need of self-propelled working mechanism wherein the health care delivery agencies including the government and beneficiaries could plan and execute health care development programmes in a coordinated and cost-effective manner. In this article, the author suggests the development of health care delivery system through cooperatives. The most important feature of such an approach is that of self-reliance and the increased community participation, the author feels.

THE development of health care delivery system in our country has been one of the abiding concern since Independence. Despite all out efforts during the last thirty seven years, majority of the population, especially in rural areas, is still devoid of basic health facilities. In an effort to evolve an efficient and effective health care delivery system, the strategy of health care planning has been changed repeatedly but with limited success.

The reasons for this limited success include:

1. Lack of proper identification of health needs of population, especially the rural one.
2. Lack of involvement of people and their organisations in the decision making process regarding the delivery of health care.
3. Lack of linkage of block level development plans with grass root level problems and needs.

Community based delivery

The limitations enunciated above are well known and widely discussed. Efforts to tackle these problems have also been made. Thus in order to improve involvement of the people, the idea of community based health care delivery system has been mooted and the posts of village health guides have been created, village health committees instituted and traditional birth attendants have been trained. Though laudable these efforts are, yet there is little success in improving the efficiency of health care delivery system mainly due to the lack of involvement of people in the decision making process pertaining to the delivery of health care.

It is also very much doubted that the Government effort alone will ever be sufficient to meet the health care needs of the population. Therefore, it was only recently that specific need based and area specific health improvement plans have received attention.

Health care through cooperatives

There is a need of self-propelled working mechanism wherein the health care delivery agencies including the Government and beneficiaries could plan and execute health care development programmes in a coordinated and cost effective manner. These should include the identification of primary health care needs of the community or area around which all health care development activities should be promoted. Such a programme calls for the transfer of appropriate technology in the most effective and acceptable manner, i.e., the development of health care delivery system through cooperatives. The involvement of cooperatives in the development of health care delivery system is regarded very important on account of their well known organisational structure. Besides this, cooperatives are instrumental in harnessing local initiatives, providing resources and improving mass participation. In other words, cooperatives have tremendous potentialities as nucleus to health care delivery system. Here it will be worth mentioning that whenever cooperatives have acted as nucleus of development, the impact of development programme has been more abiding.

The approach to the development of health care delivery system through cooperatives is based on both macro as well as micro considerations. The micro considerations are related to the generation of community participation and involvement in the development process and to develop self-reliance among beneficiaries while macro considerations relate to overall orientation of social and cultural set up including strengthening of existing infrastructure. Alternatively, approach to the development of health care delivery system, taking cooperatives as nucleus thereof, is a multi-pronged, multi-disciplinary and multi-directional process.

In line with the aforesaid approach, the strategy for the development of health care delivery system through cooperatives is based on the following principles:

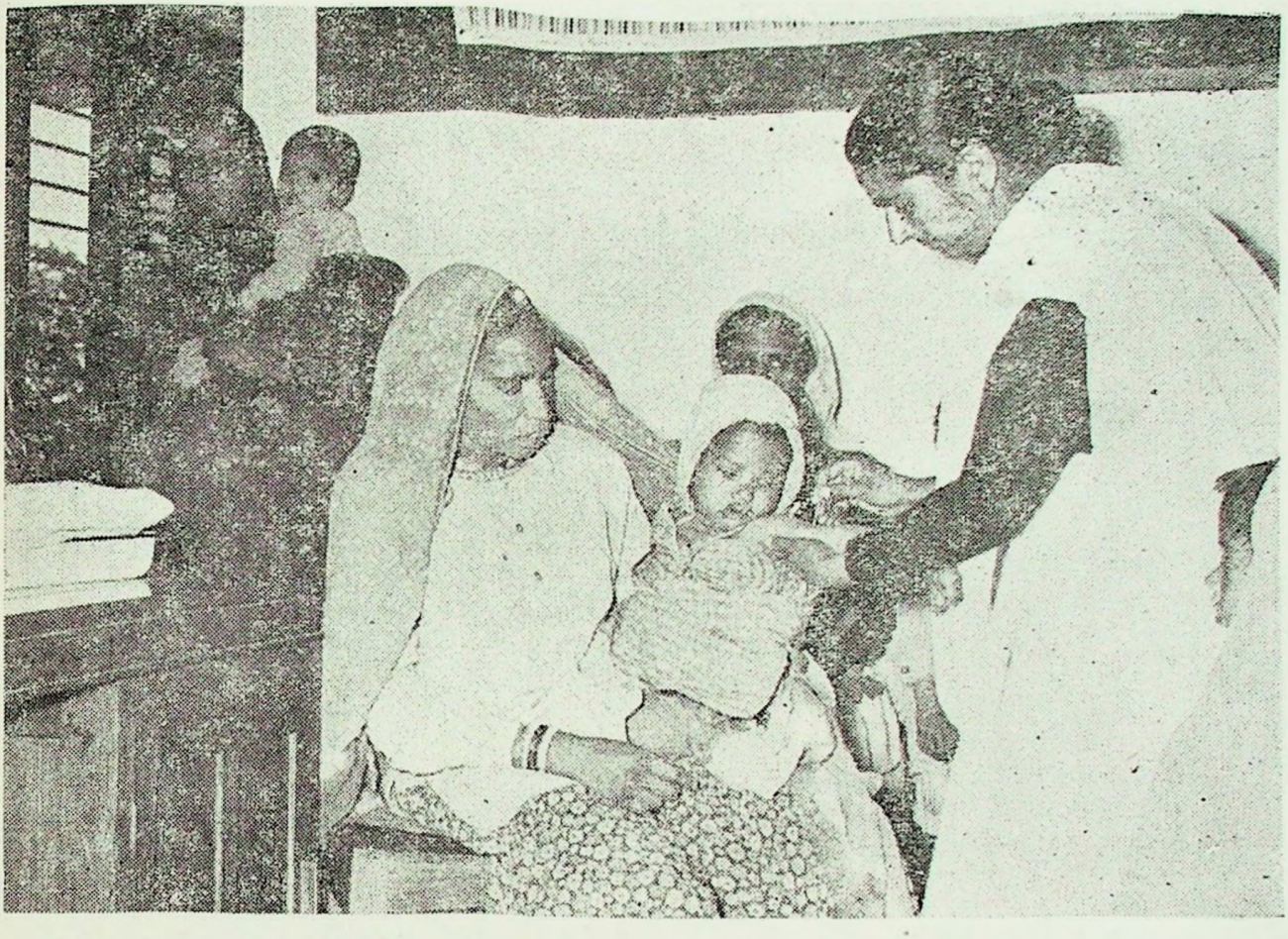
(a) A cooperative society should be the principal agency in planning and executing health development plans in the community. This society will work in coordination with other health care delivery agencies in the community.

(b) The required health needs and services would be managed by greater share and involvement of the cooperative society. It is not possible as well as desirable that all health care activities of the community or area may be taken up by the cooperative society only but the society would take an initiative in developing a working coordination with other health care delivery agencies.

(c) The health care development plans will not only touch the health care needs but would encompass in itself social and cultural aspects of life. The consideration is that the social and cultural aspects may be so oriented that they act as catalytic agents for the improvement of health of the people.

(d) The resources needed for the development of health care delivery system would flow from the cooperative society itself and also from other health care delivery agencies including the government's budgetary provisions.

(e) The people will actively be involved in planning and executing the plan for the development of health care delivery system. They will



Community based health care delivery system needs to be vigorously implemented for securing people's participation.

be enthused to develop a sense of self-reliance and involvement in providing health for all in the community.

Organisational setup

In order to develop a model of health care delivery system based on the above principles, the following organisational framework is suggested for the rural population. The model can be modified suitably for the urban populations also.

1. *Formation of a Village Health Assembly*: Village Health Assembly will be the apex body in a particular village or community. This assembly will function as a catalytic agent creating an urge in the people for the development of health services in their village/area. This assembly will also help in motivating the villages for involvement and participation in the village development plans. All families in the village or community will have representation in the assembly and shall contribute a fixed amount annually as the membership fee of the Assembly. This fee may be decided by the assembly itself. Functions of the Village Health Assembly will be:

- to identify potentialities of development.
- to bring out factual position about the state of health in the village/community.
- to review various ongoing schemes and health care development plans in the village including the work of village health guide and traditional birth attendants.
- to locate gaps in the existing infrastructure of health care delivery system.
- to formulate specific proposals, schemes and programmes as per needs.
- to raise funds to meet health needs of the village/community.

In order to facilitate the functioning of Village Health Assembly, it is proposed to divide the Assembly into following five working groups:

1. Working group on family welfare.
2. Working group on communicable diseases.
3. Working group on maternal and child health.
4. Working group on environmental sanitation.
5. Working group on other health problems.

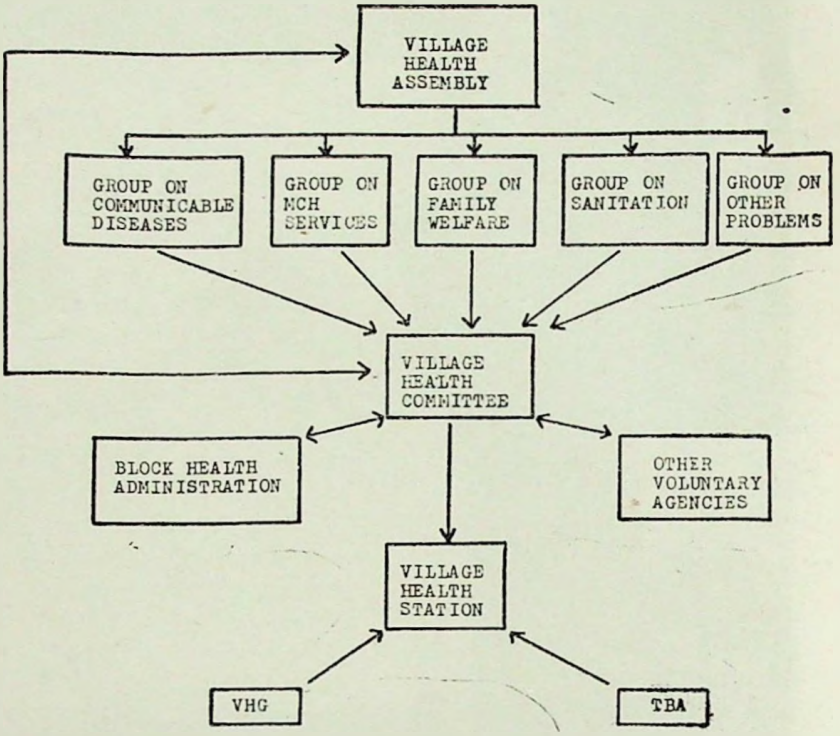
These working groups as well as the Village Health Assembly, shall, in the normal course, meet twice in a year. However, in case of emergency, the meetings of the Assembly as well as the working groups can be called at short notice.

2. *Formation of Village Health Committee*: Village Health Committee shall be the chief executive body in the matters of health in the village/community and shall be elected from the Village Health Assembly. Each working group of the Assembly shall elect a representative for the Village Health Committee. Village Health Guide of the village or community shall be the member secretary of the Village Health Committee. Functions of the Village Health Committee will be

- collecting membership dues from the members of Village Health Assembly.
- maintaining the accounts.
- organising meetings of Village Health Assembly as well as of working groups.
- implementing the decisions of Village Health Assembly.

VILLAGE HEALTH CARE DELIVERY SYSTEM

(Organisational set up)



- keeping liaison with authorities of various health care delivery agencies including the government.
- supervising the work of village health guide and traditional birth attendants.

Village Health Committee shall meet every month to review health situation of the village and shall submit a report on health status to Village Health Assembly. The Committee will also inform the block health administration about the working of various paramedical workers in the area.

3. *Establishment of a Village Health Centre*: The mole calls for the establishment of a health centre in the village/community. This health centre will be the platform from where all health care activities will be carried out in the village. This health centre will also be the meeting place of Village Health Assembly and Village Health Committee. The centre will remain open on fixed hours every day and will be run by the Village Health Guide and Traditional birth Attendant in the village/community. The cost of running the health centre will be borne by both the Village Health Assembly as well as the government or some other health care delivery agency.

Role of Block Health Administration

Though the Block Health Administration will have no controlling and supervisory role in the day to day functioning of Village Health Centre yet it will work in close coordination with the Village Health Assembly and Village Health Committee. It is clear that the village health care delivery system modelled here cannot meet all health care

(*contd. on page 123*)

HEALTH CARE IN OLD AGE

DR HEMANT KUMAR

Periodic health check-up of elderly and middle aged people, early detection and treatment of diseases, scientific handling of advanced cases, are important preventive measures against old age diseases. The author feels that the importance of periodic check-up should be brought home to the public through the active cooperation of the press, through public lectures and employment agencies.

HEALTHFUL longevity has always been the cherished dream of man. This is also evident from a hymn of *Atharva Veda*, *'Jiwem Sardah Satam'*, *'Pasyem Sardah Satam'* denoting a longing for one hundred years of life with functioning senses of vision and hearing.

Life-expectancy is on the increase for the past many years due to improved standards of medical care and nutrition. Some of the effects, which are considered inevitable in old age, may be averted, e.g., progressive change of muscle into fat, reduced cardiac output and fall in bone calcium level, etc., if

vigorous activities and normal weights are maintained. But changes in eyes, ears, kidneys, joints are unlikely to be modified by any known measure. Some of the measures which may be taken to attain and maintain positive health and to lead a better quality of life are summarised below.

Nutrition

Consumption of suitable diet is the greatest single factor in preventing senility, increasing life span and the period of vigorous activity.

It is also felt that good nutrition and composition of diet, notably its deficiencies and imbalances have far reaching effects not only later in life, but also at crucial periods of development. Chebotarev (1973) also recommends good nutrition and balanced diet to increase life span.

Firky (1981) feels that a diet of proper quality is the factor that lengthens the human life span, and the excessive quantities of diet, whatever is its quality, will tend to shorten it. This can never be considered apart from individual's feelings, economic status, culture and state of health. The influence of eating practices are continuous and cumulative.

It is recommended that caloric intake in old age should be 20-30 per cent less, as compared to young age. The consumption of proteins should be about IG per kilogram of body weight, and not more than 25 per cent of the total calories to be provided by fats. Rest of the calories may be derived from carbohydrates which should contribute about 50-60 per cent of total caloric intake. Vitamins, especially ascorbic acid and B-complex group of vitamins are needed more than in adult life, because of reduction in bacterial flora and absorption capacity of the intestine. B-Complex also helps in the maintenance of muscle tone of gastro-intestinal tract.

Weight and Obesity

Obesity has been observed to be associated with certain cardiovascular and metabolic disorders, particularly in early old age. A number of factors contribute to the causation of obesity including age, sex, economic status, physical activities, psychology, eating habits, genetic factor, endocrine, pregnancy and metabolism.

Obese persons are more prone to develop various cardiovascular, psychological, skin, and metabolic disorders as compared to non-obese persons. Even their life span tends to be reduced. The statistics of the metropolitan Life Insurance Co. (USA) have shown that for a man of 45, an increase of 12 Kg above standard weight reduces his life expectancy by 25 per cent.

Exercises

Regular physical exercises have been recommended for aged persons as it is felt that exercises help a great deal in the maintenance of good physical health.

Palmore (1970) observed that aged persons not doing proper, adequate locomotor activity are two and half times more prone to develop illness and they have to be hospitalised for more than 2 weeks per year because of physical ailments. They have to visit hospitals one and a half times more than those who perform adequate exercises.

Herman (1971) also emphasised on physical exercises for elderly persons. He divides the elderly persons into two group: (i) those who have led an active physical life, (ii) those who have led a sedentary life. For the persons belonging to the former group, he suggests to continue active physical exercises as before. For the persons belonging to the latter group, he recommends mild physical exercises to begin with, e.g., hiking, cycling, etc., to re-educate their muscles, heart and nervous system without causing any strain.

Smoking

It has been established that mortality among cigarette smokers, from all causes, is twice as high as among non-smokers and corresponds to a difference

(contd. on page 104)

HEALTH OF THE ELDERLY

A CONSULTATIVE meeting for national plan formulation for the Health of the Elderly was held in the WHO South East Asia Regional Office, New Delhi, from 28 to 30 November 1984. Participants from Bangladesh, India, Nepal, Sri Lanka and Thailand attended the meeting which had the following objectives:—

(1) To review the Global Plan on Ageing in the context of the regional and national situation.

(2) To prepare guidelines for the formulation of the national plan through the suitable adoption/adaptation of the global plan of action with the focus on India.

(3) To identify the role of governmental, non-governmental and other agencies in programmes for the health of the elderly at the national level.

The consultative meeting recommended the following guidelines for the formulation of the National Policy and Plan for the Health of the Elderly:

1. **Situational analysis**

(a) The existing health status of the elderly population should be assessed in terms of quantity and quality. The qualitative status should include details such as spiritual, social, economic, physical and mental well-being and other humanitarian and development aspects of ageing.

(b) The demographic characteristics should be analysed with special reference to the age groups 60-70, 70 and above.

(c) The needs of the elderly and the current resources available to meet these needs should be identified.

(d) A suitable proforma should be designed for obtaining essential information through a sample survey and appropriate parameters identified for developing an effective programme with an in-built monitoring and evaluation system for the health of the elderly.

2. **Preliminary action**

(a) *Mechanism for planning and management*

An identified national focal point or nodal ministry will constitute a National Committee with representatives from different sectors/disciplines to guide and promote a preliminary community-based action plan.

(b) *Pilot projects*

(i) Pilot projects should be launched and suitably located to represent geographical, cultural and socio-economic variations in the country.

(ii) Such pilot projects should be organized for providing knowledge and skills for developing appropriate patterns of similar community-based services towards promotive, preventive, curative and rehabilitative aspects of the elderly in the country.

(iii) Budgetary requirements should be identified and adequate resources mobilized for implementation of these pilot projects.

3. **National policy and plan**

(a) The Existing National Health Policy should be reviewed and adequate provision made for the health of the elderly to guarantee the promotive, preventive, curative and rehabilitative needs of this group.

(b) Priority attention should be directed towards the preservation of traditional values with appropriate action to ensure socio-economic security for the elderly and an acceptable quality of life.

(c) The national plan and strategy for the health of the elderly should promote the integrated and community-involved development of health activities in accordance with the objectives of Health for All by the Year 2000 through the primary health care approach.

4. **Resources**

Resources for organizing and implementing the integrated community-based action plan for the health of the elderly should be mobilized from the communities, voluntary organizations, industrial sectors, national budget and international agencies including non-governmental agencies.

5. **Time frame**

(a) The situational analysis should be completed within one year.

(b) The results based on preliminary action through pilot projects should be available by the end of the third year.

(c) The review of any existing national plan and its reformulation or the formulation of national plans, with a policy declaration should be finalized within a period of five years.

— H.F.A. 2000, November-December 1984

(*contd. from page 102*)
in life expectancy. Stopping smoking would be expected not only to increase the average life span, but also to promote better health by eliminating diseases such as emphysema.

Percentage of smokers among aged population seems to be fairly high in our country. Garg *et al.* (1982) in his study reported that 23.2 per cent of aged persons smoked *bidis* and 8.7 per cent were cigarette smokers.

Smoking also reduces total life span. In a study of aged subjects it was observed that two-third of heavy or moderate smokers died sooner than expected, and underwent more operations, paid more visits to doctors, and suffered more from ill health of various nature.

Franklin (1977) comments, 'stop smoking and reduce the incidence of Myocardial Infarction two fold'. He also feels that avoidance of smoking is an important measure in the prevention of death and disability. Maldhure *et al.* (1982) observed in a study of 108 workers in a cotton mill, that chronic bronchitis was nine times more common in smokers as compared to non-smokers.

The 1971 report of the Royal College of Physicians of London on the effects of smoking on health provides useful summary of information on the diseases now known to be associated with smoking-cancer of the lung, chronic bronchitis and emphysema, coronary artery occlusion, angina pectoris, cancers of mouth, pharynx, larynx, and oesophagus, cancer of the bladder and pulmonary tuberculosis. Among patients with peptic ulcer, those who smoke have a higher death rate than those who do not, and a mother smoking during pregnancy may retard the growth of the foetus.

Stresses and Strains

It has been proved beyond doubt that excessive physical or mental stresses and strains may precipitate or accentuate diseases like angina, bronchial asthma, hypertension, peptic ulcer, hyperthyroidism, various forms of dermatitis, migraine and ulcerative colitis.

It is, therefore, advocated that aged persons should try to minimise the strains and stresses to which they may be exposed to avoid precipitation or accentuation of related diseases. which sometimes may even involve the risk of life, e.g., ischaemic heart diseases, bronchial asthma, etc. Joint family system is ideal for elderly in the present setup, as it helps in reducing physical and mental strains of life to which they are exposed.

Ssenkoloto (1982) also feels 'family support' as probably the best media of support for elderly and would add life to years.

Chebotarev (1982) feels 'what is most important is that in extreme old age, people should not lose interest in the joys of life. It is equally vital that they should still do intellectual and physical work within their capacity and society should continue to benefit from their experience'.

Regular Check-up

It is suggested that in order to prevent death and disability, aged must seek early diagnosis and prompt treatment of his ailments and maintain normal serum tryglyceride and cholesterol levels by appropriate dietary changes as needed.

Periodic health check-up of elderly and middle aged people, early detection and treatment of diseases, scientific handling of advanced cases, are important preventive measures against old age diseases. It may also be emphasised that importance of periodic check-up should be brought home to the public through the active cooperation of the press, through public lectures and employment agencies.

To minimise physical and psychological deterioration in old age, preventive medical measures should be taken earlier in life. Chemotherapy can certainly help to improve the quality of later life by prolonging the healthy years. As there is no cure for old age, early prevention of degenerative changes holds the key to sustained physical and mental well-being in later life.

Dr Mahler, Director General of WHO believes that the elderly need prompt clinical care when they are ill and here the thrust of primary health care can bring about important change by acting as an early warning and first intervention system. However, the entire range of medical rehabilitative services should be ready to be called into play when required.

Preservation of traditional values with appropriate action to ensure socio-economic security for the elderly needs priority attention

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MALARIA CONTROL

NATIONAL EFFORT TOWARDS MALARIA CONTROL

—SMT. MOHSINA KIDWAI

The States should take urgent steps to ensure that insecticides and anti-malarial drugs in required quantity are made available in the field and whenever bottlenecks develop, these are sorted out most expeditiously.

THOSE who are working in the National Malaria Eradication Programme are well aware that control or eradication of malaria is not an easy task. Over last two decades, we have learnt that whenever efforts have slackened, the malaria has come back in a big way. We may recall that dedicated work by the malaria workers in the late fifties and mid sixties brought down the incidence of malaria from 75 million cases to one lakh per year. It was an achievement which was lauded throughout the World. However, as the areas went into advanced stage of malaria eradication, i.e., maintenance phase and were handed over to General Public Health agencies to keep the malaria free status, in 50 per cent area of the country, because of lack of infrastructure and complacency of general field staff, the focal outbreaks started occurring in the country. As a result of this, between 1965 and 1976, there was 64 fold increase in malaria incidence in the country. The total malaria positive cases recorded during 1976 were 6.4 million.

The reason for the same was indifferent case detection and delayed institution of remedial measures to contain the focal outbreaks. To some extent, the delays in supplies of insecticides resulted in poor and untimely spray coverage and were also responsible for this resurgence.

Strategy to control malaria

Government took notice of this rising trend in malaria as early as 1968 and resorted to realistic rephasing. They also constituted a team of national and international experts to go in-depth in the problems of malaria and the control strategy. As a result of the recommendations of the In-Depth Evaluation Team and the Consultative Committee of Experts, it emerged that it was not possible to eradicate malaria with the present technology in difficult areas inhabited by approximately 90 million people. The goal of eradication was deferred and a strategy to control malaria and to maintain the gains achieved was evolved and implemented under the Modified Plan of Operations.

It is heartening to know that since implementation of the Modified Plan of Operation in 1977, there has been a steady decline in the incidence of malaria in the country. However, whereas from 1977 to 1979, the rate of decline was satisfactory, thereafter the rate of decline has slowed down.

In 1979-80, the malaria eradication programme was made 50:50 centrally sponsored scheme. Under this scheme, the State Governments were expected to provide matching grant for malaria control. Those

States, which were using BHC and Malathion were expected to purchase these insecticides out of their share and also meet the operational cost of spray operations, etc., initially, to be shared later, on 50 per cent basis with the Centre. However, some of the States did not provide matching grants for the programme in spite of the funds made available by the Planning Commission and the Centre. This resulted in inadequate procurement of insecticide by the States. Further the required funds for engaging spray staff were not sanctioned by the State Governments leading to poor insecticidal spray coverage both in time and space.

Occurrence of new cases of malaria cannot be controlled by any other means except by good spray coverage and that has been the reason for slow progress of the programme in many of the States over the past few years and particularly, during 1983-84. As per reports received so far, at the Directorate of NMEP for the year 1984, it has been observed that the total incidence of malaria in the country has gone up by 12 per cent to which 21 States and Union Territories have contributed.

P. falciparum infection, if not treated in time, is capable of producing mortality. It is necessary that in areas where this parasite is predominant, special measures should be taken up. The Government of India with the help of SIDA and WHO launched a special programme of *P. falciparum* Containment in 1977 covering north-eastern States and some areas in the States of Orissa, Bihar, West Bengal, Gujarat, Maharashtra and Rajasthan. Under this programme, special inputs have been provided to strengthen the supervision of field operations. It is satisfying to note that in these areas, incidence of malaria including *P. falciparum* has declined over the years.

However, it is a matter of great concern that the areas of Uttar Pradesh, Bihar, Haryana, Delhi, Rajasthan, Punjab, which had traditionally low *P. falciparum* incidence in recent past, are now recording high incidence of *P. falciparum* In these areas, it is necessary to strengthen the operations to prevent deaths due to *P. falciparum*. These States should take timely spray operations in areas with high incidence of malaria and strengthen the surveillance operations, so that a person suffering from malaria can immediately get clinical relief and also the deaths can be prevented by proper treatment.

Urban Malaria

Due to intensified spray operations in the rural areas, the incidence of malaria in rural areas went down drastically. However, in the urban areas the incidence of malaria went up because of lack of interest by local bodies in carrying out antilarval operations. Realising the financial difficulties and constraints of States and local bodies, Government of India took up an Urban Malaria Scheme under NMEP. Under this Scheme, 131 towns were sanctioned. Some of the States have not yet implemented the scheme in full in many of the towns sanctioned by the Central Government. The Urban Malaria operations except in few towns are not being implemented properly, and it has been observed that in some of the towns, the incidence is going up year after year. To specifically mention Madras and Calcutta; these metropolitan cities have got adequate resources and man power, but due to poor implementation of field activities, not much has been achieved.

Resistance to insecticides

It has been often brought out by the States that one of the reasons for increasing incidence of malaria is the resistance of vector to DDT and BHC. The experiments carried out by the Malaria Research Centre of the Indian Council of Medical Research and NMEP have revealed that even in those areas, where vector resistance is found by laboratory tests, improved spray operations with adequate doses and total coverage with DDT can bring down the incidence and there is no immediate need to change the insecticide. However, in the past, on the recommendations of the experts, in some areas alternate insecticide Malathion was introduced, and considering the financial constraint of the States, it was made 100 per cent Centrally Sponsored. The States were allocated adequate funds for purchase of Malathion. It is observed that some of the States did not purchase Malathion in time and the targetted areas could not be covered.

Recently, some of the States have approached the Central Government for change of insecticide, i.e., from DDT/BHC to Malathion in some more areas. Unless the operations are geared up in the existing areas and it is finally evaluated on technical grounds, further whatever Malathion has been provided is used satisfactorily with good results, it will not be possible for the Central Government to increase the

areas under Malathion coverage. Another problem of resistance in malaria parasite to chloroquine appeared a few years back. We have set up a machinery under the Central Government to monitor the foci of P. falciparum resistance to chloroquine all over the country and on the basis of the results so obtained, alternate drug strategy is decided in consultation with the experts. However, to prevent extension of these foci, it is necessary that this strain of malaria parasite should not be transmitted or allowed to extend to other areas; this can only be done by adequate intensive and timely spray operations, detection of cases and treatment. The Directorate of NMEP has been informing the State Governments regarding location of such foci. It is for the State Governments to see that the spray operations in these areas are appropriately conducted with strengthened supervision.

Lack of supervision

Last year, while reviewing the programme, it was found that one of the reasons for poor spray coverage was lack of supervision and inappropriate approach to the community. On this subject, the existing advice of the Central Government was not being implemented. A detailed letter was sent to all State Health authorities at various levels outlining the methods in regard to planning of spray operations and health education, so as to obtain full public co-operation. It is important to know how far this has been implemented.

Nearly 40 per cent of the resources allocated to Health Sector are being earmarked for malaria programme every year. Such a large chunk of resource of the country have to be utilised in a gainful manner for malaria control. Even if only one State fails to allocate appropriate funds, out of their share, for malaria control the resultant breakdown of field operations leads not only in rise of malaria incidence in that particular State, but also affects the neighbouring States due to transmigration of population for various developmental activities. It is, therefore, essential that all States should implement the programme as planned by providing adequate resources and manpower and keep pace with the national effort towards malaria control. A special drive will have to be initiated and the system of monitoring will have to be improved. The States should take urgent steps to ensure that insecticide and antimalarial drugs in required quantity are made available in the field and whenever bottlenecks develop, these are sorted out most expeditiously.

(Based on the inaugural speech by the Union Minister of Health and Family Welfare, at the All India Conference of Malaria and Filaria Workers held in Delhi from 29-31 January 1985.)

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Immunization Against Malaria

— The position in 1984

It was found experimentally 45 years ago, at the Malaria Institute of India, that a brief immunity could be induced in chicken.

THE historic success in eradicating smallpox by vaccination has provoked a demand by the public, led by their representatives and the news media, for similar achievements in other diseases notably malaria. It is obvious, particularly in most countries of South-East Asia, that the goal of HFA 2000 will not be attained if malaria persists to any great extent; and so it is natural to aspire towards a single weapon that may in one stroke, or a series of swift strokers, defeat malaria.

Unfortunately, the world is still many years away from a method of immunization against malaria that will, in terms of effectiveness and duration of protective action, be comparable to that 200-year-old veteran, smallpox vaccination. The production of such a vaccine is, nevertheless, a priority target in the world-wide programme of malaria research, and as much time is being devoted to it as to the production of new antimalarial drugs and insecticides; this demanding work involves the collaboration of a great variety of medical research institutions, ranging from the most academic scientific laboratories to teams undertaking practical tests in the field.

Malaria vaccines in theory

Successful immunization against a parasitic disease like malaria or a viral disease like smallpox depends on stimulation of the host's internal defence mechanisms, chemical and cellular, to neutralize or destroy the invader. The stimulant is a protein substance, an antigen, coating the invading organism and provoking the victim's defence mechanisms to produce a counteracting antibody. Unlike protection obtained by administration, usually at weekly intervals, of antimalarial drugs, protection through immunization should not require repeated intervention; for operational convenience, where an entire population must be reached a duration of protection of one year might be acceptable as a minimum.

At each step in its development in the animal or mosquito host the parasite is theoretically open to attack, and indeed antimalarial drugs owe their efficacy largely to their ability to bring parasite metabolism to a halt by blocking its use of one or another essential chemical. Likewise there are innumerable steps in the parasite's life-cycle where its structure, functions or even its immediate environment, on which it is dependent, might be altered by immunological actions bringing its development to a halt and either killing it directly or rendering it attractive to killer body cells. At the present time most of these avenues for immunization remain theoretical.

Malaria vaccines in practice

In these early days of the science of malaria immunology, very few of the potential avenues for immunization have been explored and shown to offer promises. The three that are being most actively developed involve destruction of three key stages of the parasite, (a) the stage that is injected into the human host, and thus initiates the entire infection—the *sporozoite,* (b) the stage that enters the human red blood cells thus initiating the clinical symptoms —the *merozoite,* and (c) the stage emerging in the mosquito's stomach to continue the parasite's life cycle in nature, having been sucked from the patient's blood by the feeding mosquito—the *gamete.* All of these developmental stages of the parasite may be coated by antibody produced by the host following specific stimulation, and are thus inactivated and delivered up to killer cells.

It was found experimentally 45 years ago, at the Malaria Institute of India, that a brief immunity could be induced in chickens by inoculating into them large numbers of sporozoites of the appropriate species of malaria parasite. The sporozoite when irradiated prior to inoculation lost its ability to initiate the infection but had an enhanced capability of evoking an immune response in the host chicken. The finding was developed in the 1960s in rodent and monkey malaria models, and by 1973 successful tests had been undertaken, under rigorous ethical and safety precautions, using the most important human malaria parasite *Plasmodium falciparum* in several volunteers.

Another approach to malaria immunization was also being developed in the 1960s, involving use of the blood stages of the malaria parasite. Injection into test animals including monkeys of these stages, principally the merozoites, immunized the animals for up to a year but again the immunity was stage-specific being protective against fresh merozoite inoculation but not against the sporozoites to be accompanied by an adjuvant which enhances the effect; only recently have adjuvants been developed that are not toxic to man.

The third stage of the parasite that is immunogenic is the gametocyte. Production of antibodies is stimulated by inoculation into the animal of concentrated gametocytes, the sexual stage that circulates without symptoms in the animal and waits to be sucked with a drop of blood into

the biting mosquito in order to initiate the parasite cycle in the insect. These antibodies, produced in the animal, are carried in the drop of blood into the mosquito, where they proceed to destroy the gametocytes which upon release from their red blood cell shelter are preparing to mate. This mechanism, therefore, does not act to prevent the malaria attack in the animal, but interfers with transmission of the disease in nature.

These three kinds of immunization have certain features in common. They are stage-specific: sporozoites induce production of antibodies protective against sporozoites, not merozoites, and vice-versa. They are species-specific: the few sporozoite trials in man indicated that the two principal types of parasites, those responsible for falciparum malaria and those responsible for vivax malaria, do not cross-protect. And they are relatively short-lasting, although there is evidence that small booster doses may prolong protection once it has been established.

Availability of malaria vaccines

Problems in producing a vaccine abound. Only live sporozoites, which are fragile and cannot readily be preserved, are immunogenic; it is impractical to maintain elaborate colonies of mosquitoes to transmit them at vaccination centres. Enormous numbers of merozoites are needed to manufacture a merozoite vaccine, and the latter must contain an adjuvant. The duration of protection is brief, being measured in months rather than (as with smallpox) years.

Nevertheless, the day that a merozoite vaccine becomes available for human trials has been brought much closer by two recent developments, a cultivation method for the mass production of merozoites (already functioning in laboratories in several South-East Asian countries), and the identification of chemicals that may prove to be safe adjuvants. it is even possible that the barrier against production of a practical sporozoite vaccine may be circumvented: a technique is being developed, whereby the antibody that destroys incoming sporozoites is produced in the animal in response not to the initial injections of irradiated live sporozoites but to less complex and fragile substances that elicit the same response.

Furthermore, genetic engineering is being invoked. Gene splicing (involving implantation in simpler and more manageable microbes such as vaccinia virus of the gene responsible for production of malaria antigen) and hybridoma production (hybridization of a rapidly-reproducing mouse cancer cell with a mouse lymphocyte cell charged to produce antibody against human malaria) are among the methods now being developed to provide us, in a few years' time practicable malaria vaccines.

— HFA 200

A STEP CLOSER TO THE MALARIA VACCINE

"Remarkable scientific progress" was made last year in the quest for vaccines against, malaria, and a vaccine will probably be tested in man within the next two years. Reporting this to the Seventy-fifth session of the Executive Board of the World Health Organization, which was held in Geneva in January 1985. Dr. Adetokunbo O. Lucas warned that much technical work remained to be done in the laboratory and in the field before a vaccine would be ready for mass immunization campaigns.

Dr Lucas—Director of the Special Programme for Research and Training in Tropical Diseases (TDR)—said that he knew of some important initiatives which were being postponed for financial reasons. There was a danger that the speed of development might be hampered, at least in part, by financial constraints.

The TDR Programme is co-sponsored by the United Nations Development Programme, the World Bank, and WHO (the executing agency). Dr Lucas reported that a number of important antigens have been identified and their structures are being defined. Biologically active fragments are being synthesized. Candidate antigens are being produced through genetic engineering, synthesis of polypeptides and splicing certain malaria parasite genes into the vaccinia virus.

As to when a vaccine will be available, Dr Lucas said: "One realistic estimate is that within the next two years a vaccine will probably be tested in man". But he added that testing of candidate vaccines in man and deployment of vaccines were two separate things. "There has been an important stride forward, but a lot of technical work needs to be done in the laboratory and in the field before a vaccine will be ready for use." There is clear evidence of industrial interest, he told the Executive Board. Several pharmaceutical companies have become involved in the development of the malaria vaccine and this should accelerate the process. Malaria is a very widespread debilitating disease which particularly affects the rural areas of tropical countries and is a common cause of death, especially among children. It is caused by a parasite in the bloodstream which is normally transmitted from person to person by the bite of a mosquito. In the 1960s there were high hopes that the disease could be eradicated altogether. But since then, both the malaria parasite and the mosquito have repeatedly developed resistance to every chemical compound used against them.

In 1982, a total of 6.5 million confirmed malaria cases were reported. However this figure did not include tropical Africa, where laboratory confirmation of clinical cases is very limited and reporting is, therefore, deficient. In fact, the vast majority of cases go unreported, and it has been estimated that the total of clinical malaria cases in the world in 1982 was in the neighbourhood of 90 million. The early 1980s have continued to show the general deterioration in the epidemiological situation throughout the world that has been the predominant trend over the last decade. To realize a reduction in the mortality and morbidity caused by malaria will require not only intensive national efforts, reinforced by carefully considered WHO regional and global action, but also major breakthroughs in scientific research.

—WHO Release

HEALTH STATISTICS

MORTALITY PATTERNS DIFFER EVEN IN THIRD WORLD

PETER OZORIO

The majority of deaths from all causes occurred among the under 15 age group in developing countries, and in the over 65 age group in industrialized countries. Infant mortality rates are lowest in Japan, the Netherlands and the Nordic countries. Life expectancy is highest in Japan for both males and females. One-hundred and thirty seven countries reported some two million cases of measles, a major childhood disease, during 1982. These are among highlights of the World Health Organization's World Health Statistics Annual, 1984. World Health Organization, Geneva, just published.

SIXTEEN developing countries of the Western Pacific Region of WHO reported altogether more deaths in 1980 from diseases that normally afflict affluent nations than from infectious and parasitic diseases.

An estimated 32 per cent—or 2.9 million—of the deaths in these countries were caused by diseases of the circulatory system, and other degenerative diseases, such as diabetes, stomach ulcers, and cirrhosis of the liver, which are among the main problems of the industrialized world. Infectious and parasitic diseases, the number one killers in the Third World are estimated to account for 25 per cent—or 2.6 million—of all deaths reported by the 16 countries, the lowest proportion of all developing regions. This is attributed mainly to reduced mortality from such diseases in the largest developing country of the Western Pacific region—China.

These figures are contained in the *World Health Statistics Annual*, 1984 of the World Health Organization (WHO) which gives mortality for 150 causes of death, plus estimated infant mortality rates as well as life expectancy rates for Africa, the Americas, the Eastern Mediterranean, Europe, South-East Asia and the Western Pacific, the six geographical regions of WHO.

Just published, the 400-page Annual also gives morbidity (the number of cases) for the world's leading childhood diseases—diphtheria, measles, pertussis, poliomyelities, tetanus, neonatal tetanus, and tuberculosis.

"The dissemination of this information will hopefully encourage countries to use these data to identify health needs and to improve the management of their health systems" the report says.

The following are estimates of mortality for infectious and parasitic diseases for other developing regions:

- 50 per cent—or 3.5 million—of all deaths in the African region;
- 45 per cent in the Eastern Mediterranean and South-East Asian regions—or 1.8 and 6.7 million deaths respectively;
- 31 per cent—or 1 million—in Latin America and the Carribean.

"The dissemination of this information will hope- against uncritically viewing the health problems of all developing regions together, and should stress the need for a more careful scrutiny of regional health problems."

All causes of death

A total of 50 million deaths from all causes were estimated to have occurred throughout the world, during 1980. The region-by-region breakdown:

South-East Asia, 15.5 million deaths; the Western Pacific, 10.5 million; Europe, 8.5 million; Africa, 7.2 million; the Americas, 5.2 million; and the Eastern Mediterranean, 3.9 million. The mortality pattern by age structure is as follows :

— In developing countries, the majority of deaths occurred in the under 15 age group, namely 60 per cent in the African and Eastern Mediterranean regions; over 50 per cent in South-East Asia; and 40 per cent in Latin America and the Caribbean.

For the 16 developing countries in the Western Pacific, the figure is under 20 per cent again largely attributable to China's progress in reducing mortality from the infectious and parasitic diseases which tend to claim mostly young lives.

— In developed countries the majority of deaths—from 65 to 70 per cent—occurred among people aged over 65, as compared to 25 to 40 per cent for Third World countries.

Infant mortality

The infant mortality rate (deaths under the age of one year) ranged from 6 to 8 deaths per 1,000 live births for Japan, the Netherlands, and the Nordic countries to over 100 for most African and many Asian nations. Nonetheless, the rate in most African countries showed a decline by more than 20 per 1,000 over the last decade. Among the five lowest rates worldwise over the period 1980-85:

— *In Africa*: Mauritius and Reunion with 42 deaths per 1,000 live births; Cape Verde, 77; Zimbabwe, 83; and Botswana, 87.

— *In Latin America and the Carribean*: Puerto Rico with 17 deaths per 1,000 live births; Costa Rica, Cuba plus Martinique, 20 each; and Barbados plus Guadeloupe, 23 each.

— *In South-East Asia*: Democratic People's Republic of Korea with 32 deaths per 1,000 live births; Sri Lanka, 38; Mongolia, 50; Thailand, 51; and Indonesia, 87.

— *In the Western Pacific*: Singapore, with 11 deaths per 1,000 live births; Hong Kong, 12; Fiji, 28; Malayasia and the Republic of Korea, 29; and China, 38.

— *In developed nations*: Finland, Sweden, plus Iceland with 7 deaths per 1,000 live births each; and Denmark, Norway, the Netherlands and Japan, with 8 each.

— *Among other infant mortality rates*: England and Wales with 11 deaths per 1,000 live births; France 10; Canada 11; the United States 12.

Life expectancy

Japan leads in life expectancy for both males and females, the WHO Annual shows. For the former, it is 74.5 years, and for the latter, 80.2.

Greece is second in male life expectancy, at 73.6 years, followed by Hong Kong, 73.5; Sweden, 73.5; and the Netherlands, 72.8.

Hong Kong is second in female life expectancy at 79.9 years, followed by Norway, 79.8; the Netherlands, 79.7, and Sweden, 79.6 Hong Kong is the only Third World area ranking among the top five with a life expectancy for men and women equal to that of industrialized nations. Over the last decade, Viet Nam showed the largest increase in life expectancy, 8.5 years; followed by China, 8.3 years; Jordan, 7.6 years; and Syria, 7.3.

Specific causes of death

While general mortality figures are shown for developing and developed countries alike, the Annual gives specific causes of death, adjusted for age, for 30 countries, mainly industrialized. Highlights include:

— *Ischamic heart disease*: The death rate from heart attack for both men and women ranged from a peak of 300 per 100,000 population adjusted for age, as in Scotland, to a minimum of 49, in Japan. Second among the top five rates are those of Ireland and Finland, each reporting around 280 deaths per 100,000; followed by Czechoslovakia, 270; and New Zealand, 267.

Other rates include: Sweden with 264 deaths per 100,000; the United States, with 250; England and Wales, with 244; plus, among the lower rates, the Federal Republic of Germany's 166; Itlay's 129; and France's 75.

— *Cancers, All forms*: The death rates from cancers for both men and women ranged from a maximum of 256 per 100,000 population, age-adjusted, as in Luxembourg, to a minimum of 118, in Puerto Rico.

Second among the top five rates are those of Hungary, reporting 244 deaths per 100,000, followed by Scotland, 238; Belgium and Czechoslovakia about 230 each.

Among other rates are the following: England and Wales with 215 deaths per 100,000 population; France 205; Canada with 202; the United States 192. Among the lower rates: Japan, 163; Kuwait, 150; Bulgaria, 149; and Mauritius, 124.

— *Lung cancer*: The death rate from lung cancer along ranged from a peak of 70 per 100,000 population, age-adjusted, as in Scotland, to a minimum of 22, in Sweden.

Second among the top five rates are those of England and Wales, as well as the Netherlands reporting between 56 and 57 deaths per 100,000 population each, closely followed by Belgium 53.7. Canada

and the United States, along with Denmark, Czechoslovakia, Hungary and Luxembourg, each showed a death rate of roughly 50 per 100,000.

Among the lower rates, are those of Norway with 24; and of Japan, with 23.

Figures for Canadian women alone show a steadily increasing death rate from lung cancer, from 18.1 in 1979, to 22 per 100,000 in 1982, representing a 20 per cent increase in deaths in four years, doubling that of Canadian men.

— *Alcoholism*: The death rates from cirrhosis of the liver for both sexes ranged from a peak of 33 per 100,000 population, age-adjusted, in Italy, to a minimum of four, that of England and Wales.

Second among the top five rates are those of Hungary, reporting 31.7 per 100,000 population, followed by France, 28.2; Austria, 27.2; and Yugoslavia, 24.4.

Among other rates are the following: Federal Republic of Germany, 22.8 deaths per 100,000; Czechoslovakia, 20.3; Japan 15.6; the United States, 15.5; Canada 11.9, plus among lower rates, that of Norway, 4.4; Ireland, 4.7; and the Netherlands, 5.9.

— *Accidents*: The death rates from road accidents for both sexes ranged from 23.4 per 100,000 population, age-adjusted, as in Yugoslavia, to a minimum of 8.8, in Sweden.

Second among the top five rates are those of Austria, reporting 23.1 per 100,000, followed by the United States, 21.4; Australia, 21.3; and New Zealand, 20.6.

Among other rates are the following: Belgium with 21.2 deaths per 100,000 population; France, 19.7; the Federal Republic of Germany, 16.2; Canada, 15.5, plus, among the lower rates, that of Sweden 8.8; England and Wales, 9.7; and Japan, 10.7.

Childhood diseases

The incidence by region of childhood diseases reported to WHO during 1982 is as follows:

— *Measles*: Some 2 millions cases reported by 137 countries. The breakdown: 660,000 reported in the Western Pacific; 630,000 in Africa; 230,000 in South-East Asia; 200,000 in the Eastern Mediterranean; 190,000 in Europe; and 130,000 in Americas.

— *Tuberculosis*: Some 1.6 million reported by 114 countries. The breakdown: 750,000—nearly one half of the total—in the South-East Asia; 420,000 in the Eastern Mediterranean; 205,000 in Africa; 175,000 in the Western Pacific; 30,000 in the Americas; and 15,000 in Europe.

— *Pertussis (whooping cough)*: Some 1.1 million cases reported by 135 countries. The breakdown: 335,000 in the Western Pacific; 305,000 in South-East Asia; 180,000 in Africa; 120,000 in the Eastern Mediterranean; 85,000 in the Americas; and 60,000 in Europe.

— *Tetanus*: Some 75,000 cases reported by 127 countries. The breakdown: 50,000 in South-East Asia; 9,000 in Africa; 7,000 in the Western Pacific; 4,000 in the Eastern Mediterranean; 3,700 in the Americas; and 300 in Europe.

— *Diphtheria*: Some 53,000 cases reported by 120 countries. The breakdown: 20,000 in South-East Asia; 18,000 in the Western Pacific; 10,000 in the Eastern Mediterranean; 3,800 in the Americas; 1,500 in Africa; and 140 in Europe.

— *Poliomyelitis*: Some 37,000 cases reported by 124 countries. The breakdown: 16,000 in South-East Asia; 9,000 in the Western Pacific; 7,000 in the Eastern Mediterranean; 3,000 in Africa; 800 in the Americas; and 250 in Europe.

— *Neonatal tetanus*: Some 6,000 cases reported by 51 countries. The breakdown: 2,000 in South-East Asia; 1,500 in Africa; 1,400 in the Eastern Mediterranean; 800 in the Americas; and 50 in the Western Pacific. No cases of neonatal tetanus were reported in Europe in 1982.

Although the number of countries reporting these diseases has increased, the total number of cases reported "for most diseases is known to be low," the Annual says. For instance, while more countries are reporting neonatal tetanus—caused by unhygienic ways of cutting the umbilical cord—experts estimate that figures represent only between two and five per cent of all cases.

Furthermore, even though some one million deaths are estimated to occur in the world from the disease, the WHO Annual says, "until recently tetanus immunization of women has not been considered a priority in most immunization programmes and reporting of tetanus separately from all tetanus is only being done by a few countries." Though still low, reporting is better for measles, "estimated to be about three per cent" and even polio, "between one and 26 per cent."

"Documentation of success is required to sustain the political and financial support being provided to the immunization programme", the WHO Annual notes, "and documentation of failure is required to guide remedial actions."

—WHO Feature

CANCER

CANCER CELLS REMOVED BY MAGNETIC BEADS

TIM HAINES

IN the summer of 1983 a little girl's life was saved by some minute polystyrene beads, a magnet and a special cocktail of chemicals from a mouse.

This extraordinary treatment was the result of five years' work by Dr John Kemshead and his team at the Imperial Cancer Research Fund (ICRF) in London. The team is now at the centre of an international programme to treat children suffering from the same disease that threatened the girl's life—a rare but lethal form of cancer called neuroblastoma.

The technique used is a revolutionary way of cleaning tumour cells out of bone marrow and, if it proves successful in the long term, it has implications in many other forms of cancer.

All aggressive tumours, such as neuroblastoma, have an unpleasant habit of metastisising where bits of cancerous tissue break away from the original growth and settle elsewhere in the body to form secondary cancers. It is, therefore, vital when treating these patients to dose the whole body. Unfortunately, bone marrow is very sensitive to the strong chemicals and radiation used by doctors to kill the malignant cells in a cancer patient's body.

Cleansing bone marrow

So, before treatment begins, some marrow is removed and kept safely while high doses of drugs are used. When the marrow is returned, it has the capacity to grow and regenerate. But the whole treatment will have been wasted if in the sample returned to the patient there are cancer cells ready and waiting to start growing again.

What Dr Kemshead has managed to do is to find an efficient method of cleaning the sample before it is returned to the treated patient. His idea was simple —make the tumour cells magnetic and then draw them out with a magnet leaving a pure marrow sample behind.

First he went to the Jet Propulsion Laboratories in Pasadena, United States of America, and borrowed some minute beads designed there by two polymer chemists. Each sphere was made of polystyrene with a magnetite core and measured only 3 μm across–in other words, tens of thousands could fit on the head of a pin. These beads could make the tumour cells magnetic but a way had still to be found of attaching them to the cell surface.

To do this, Dr Kemshead used special molecules called monoclonal antibodies. These naturally adhered to the surface of the beads and then, when mixed with the marrow sample, hunted out the cancer cells, rather like heat-seeking missiles, and attached themselves and the beads to them.

Producing antibodies

However, making the monoclonal antibodies was not easy. First the research team had to inject neuroblastoma cells into a mouse and then wait two or three months while the animal's natural defence cells made antibodies (molecules specifically designed by the immune system to identify foreign particles in the body) against the neuroblastoma. The mouse's spleen was then removed with the immune cells it contained made immortal by fusion with a myeloma cell line which just kept cloning off exact replicas. This took a further two months.

The resulting monoclonal antibodies had to be rigorously tested to make sure they only homed in on neuroblastoma cells and did not also stick to normal marrow cells. At all stages during this process there was the danger of infection—something that could wipe out the whole batch of antibodies.

Dr Kemshead estimates that it takes about a year to develop a monoclonal antibody and in order to catch all the neuroblastoma cells he used a mixture of six. Now his laboratories at the ICRF's Institute of Child Health in London have become a centre for monoclonal production. Marrow samples, chilled for

transportation, are sent from all over the world to be cleansed by the new magnetic technique. So far, 21 children have been treated in this way, some from Lyons, France, and others from Boston, United States; Milan, Italy; and Dublin, Republic of Ireland. All but one are still alive and many have returned to normal lives.

Limited number

The longest survivor is a little French girl called Claire. She had already been treated for neuroblastoma with a complete course of radiation and anti-cancer drugs. But her bone marrow still contained 2% cancer cells.

So in July 1983 about 10% of her marrow was removed and flown to London. There it was raced by car to the ICRF laboratories and cleaned by Dr Kemshead. Twenty-six days after the marrow had been returned to Claire she was out of hospital and some nine months later there had been no sign of the cancer returning.

However, this treatment is still on trial. Dr Kemshead's facilities are available only to the small group of doctors and their patients involved in the present study.

In the near future the ICRF team will continue to treat only these small numbers of patients until follow-up investigations have confirmed the efficacy of the work.

Quick contact

Meanwhile, the team continues to work on different monoclonal antibodies. The main thrust of the research has been on finding some for leukaemias or blood cancers.

It is also possible to link very potent poisons to monoclonal antibodies. These can then be injected into the bone marrow and the antibody homes in on the cancer cell bringing the toxin with it, destroying the malignant cells. It guides the poison away from the patient's normal tissue. Blood cancers are the most rewarding area to work in because, after injection, the monoclonal antibodies are quickly brought into contact with the disease. Most of the work is on childhood illnesses but the team hopes soon to have monoclonal antibodies for a blood cancer called common acute lymphoblastic leukaemia that affects both children and adults.

Dr John Kemshead of the Imperial Cancer Research Fund (ICRF), London whose team is experimenting cancer cell removal by magnetic beads

Overcoming rejection

Another area where Dr Kemshead's team is working on "cleaning up" bone marrow for transplantation. With some diseases, all the patient's bone marrow is destroyed and doctors often try to replace it with donor material.

However, unless this is a perfect match the host rejects the new tissue. This adverse reaction is encouraged by the presence of immune cells, called T-lymphocytes, in the donor marrow. If these can be identified and removed before the graft is put into the host, it will reduce the amount of rejection.

Working with groups at University College Hospital, London, and at the University of Cambridge, the ICRF researchers soon hope to have the right cocktail of antibodies to do this. For the present, the magnetic solution to one type of cancer is the only practical treatment to result from their work but, with this proving to be 99.9% successful, there is a promise of further successful treatments. △

Leading experts in the treatment of cancer pain from 22 countries met in Geneva from 11-14 December, 1984. According to recent estimates, each year more than ten million cancer patients suffer pain. In 30 per cent of cases the pain is severe or even unbearable.

FREEDOM FROM CANCER PAIN

EXPERTS in pain therapy from 22 countries have recommended wide-ranging measures to counter the general neglect of the problem of cancer pain, while simultaneously calling for education and information programmes to promote the concept of "Freedom from Cancer Pain" as a right for cancer patients.

The recommendations, made to the World Health Organization (WHO) following a four-day meeting on cancer pain held in Geneva from 11-14 December 1984 to recommend a global programme of cancer pain management, take into account virtually all aspects —psychological, technical, legal and educational—of the treatment of cancer pain.

"Drugs are the mainstay of cancer pain management", the experts state. "If used correctly—the right drug in the right dose at the right time inervals—they are effective in a high percentage of patients." And they add: "The scientific foundation for the successful treatment for cancer pain now exists."

In major recommendations, the experts:

—Urge governments to ensure that legislation controlling the use of opioids (narcotic drugs) do not "prevent cancer patients with pain from getting the pain-relieving opioids that they need."

—Call for more education in pain management at both the graduate and undergraduate levels.

—Advocate information through mass media so that patients, and particularly their families, are made aware that pain is not inevitable, and almost always controllable.

—Advocate also as the basis for the management of pain WHO's "Guidelines for Relief of Cancer Pain", a part of which is a three-stage "pain-control ladder" that sets out the drugs required—aspirin, codeine and morphine—for relieving pain.

—Ask that a global network be established to help disseminate knowledge about pain and what can be done about it. Thus far 32 countries are part of the network.

—Set as goal the treatment of cancer pain, not only in specialized cancer centres, which is the case now, but in hospitals and homes.

In the case of cancers far advanced, the experts' view is that patients receive care in their home should they wish.

Furthermore, the experts state "family members be given training in the home care of cancer patients, and receive financial support", for instance paid leave from work.

Worldwide one out of ten deaths are due to cancer. According to the experts each day close to four million people are suffering from cancer pain, or are being treated for it.

The meeting was chaired by Dr Kathleen Foley, Memorial Sloan-Kettering Cancer Center, New York. The vice-chairmen were Dr Luzito de Souza, Tata Memorial Hospital, Bombay and Dr D. C. Jayasuriya, Colombo, Sri Lanka. Dr Robert Twycross, Churchill Hospital, Oxford, was rapporteur.

Problem of cancer Pain

According to recent estimates, each year more than ten million cancer patients suffer pain. In 30 per cent of cases the pain is severe or even unbearable.

Although there is the knowledge of how to relieve pain, WHO experts say, very little is being done not only in developing countries, which lack the medications needed as well as the expertise, but also in industrialized countries where analgesics—pain-killers—are available.

He quotes as an example the US National Cancer Institute, which spent nearly $ 5.5 billion on cancer programmes from 1971 to 1976. Of that total, only $ 560,000 went for research on cancer pain.

Figures published earlier this year show that there are numerically more cases of cancer in the Third World than in developed countries. Of an estimated

5.9 million new cases worldwide, 3 million occur in developing countries. Most are incurable at the time of diagnosis.

In addition, the figures show that there are more deaths from cancer yearly in the developing world, 2.3 million, than in the developed world, 2 million.

Such facts have lead WHO to launch a consciousness-raising campaign under the theme "Cancer is a Third World Problem Too." Its aim is to prevent a third of all cancers, to cure a third, if cases are detected early enough—and to relieve pain.

A major problem in pain relief is fear of addiction, which leads physicians to under-prescribe drugs, and nurses to under-dose patients. In addition, many patients are unaware that pain can be relieved and consequently accept suffering needlessly.

Another problem is the insufficiency of professional education in cancer pain therapy. A study of textbooks on clinical management of cancer commonly used in US schools of medicine show less than a quarter of one per cent of pages devoted to pain.

Yet another problem is that of reconciling the needs of the patient for pain relieving drugs on the one hand, to legislation controlling drugs on the other.

WHO's three-step treatment

Eighty-seven per cent of cancer patients who were part of a Japanese test of guidelines for pain therapy —or a total of 136 out of 156 patients—received "complete relief" when put under a three-step treatment for the management of pain developed by the World Health Organization (WHO).

The tests were carried out in 1983-84 by Dr Fumikazu Takeda at the Saitama Cancer Center, north of Tokyo, according to a report presented at the opening of a four-day WHO meeting on pain management.

Central to the guidelines for pain therapy is the administration of analgesics—pain-killers—regularly at fixed intervals, rather than only "as required" at times of pain, which is generally the practice.

The drugs increase in strength, from non-narcotic to mild and then to strong narcotic pain-killers until the patient is pain-free—hence the concept of the treatment as an "analgesic ladder." If a drug proves ineffective, a stronger, rather than a different, drug is prescribed.

Additional drugs, technically called "adjuvants," are also used under special conditions. Psychotropic drugs are prescribed, for instance, to calm fears and anxieties.

As part of a new initiative, WHO is attempting to raise consciousness to a largely neglected problem in cancer care, the management of pain. The guidelines have been developed essentially to teach non-pain specialists how to control most cancer pain by the use of a few potent drugs well.

The ages of the patients treated at the Saitama centre ranged from 8 to 83. Most of them sufferred from gastrointestinal cancer, but lung, head and neck, and breast cancer were among prevalent forms. In 80 per cent of patients cancer had spread.

Before cancer therapy commenced, pain was severe for about two-thirds of patients. "Most patients suffered from their pains throughout the day, and had anxiety and fear, and some were deeply depressed," Dr Takeda said.

Aspirin or paracetamol was given by mouth every four to six hours to patients with mild or moderate—and at times even severe—pain. Where these non-narcotics were ineffective, codeine, a mild narcotic, was added, administered, again, at regular intervals.

Where pain was not relieved by non-narcotics or mild narcotics, and when pain was severe and chronic, morphine was given every four hours, in some cases with adjuvant drugs.

"Psychological dependence was not reported at all," says Dr Takeda. But, "in the strong narcotic group, nausea was the most frequent side effect." It was observed in 21 patients.

Overall, through the application of the "ladder" principle for cancer pain relief, 87 per cent of patients received "complete relief," 9 per cent "acceptable relief," and the remaining 4 per cent "partial relief."

In addition to Japan, tests are also being carried out in India, Italy and the United States.

One out of ten individuals world-wide dies of cancer. According to WHO, over a half of all cancer patients suffer needleesly from pain because pain-killers are not adequately used, and too little training is provided to cancer specialists in how to treat pain.

What is needed now, WHO experts say, is to apply what is already known to bring help to millions of sufferers throughout the world. △

BATTLE AGAINST CANCER

Deep-Tumour Treatment On Trial

Doctors hope that trials, soon to start in Britain with the world's most advanced neutron therapy machine, will lead to the successful control of deep-seated tumours for which there is at present no effective treatment.

The 60 million electron-volts cyclotron machine, which has the most penetrating and accurate beam of neutron radiation available in any hospital, has been completed at Clatterbridge Hospital near Liverpool (North-West England) at a cost of £3 million. It will start treating patients at the end of this year.

Neutron therapy was developed as a result of clinical research on a cyclotron at London's Hammersmith Hospital, which was the first machine of its type to be used exclusively for medical research. It has now been used to treat over 2,000 people suffering from tumours that were inoperable or resistant to radiotherapy. At least a dozen high-energy machines are now involved in cancer treatment in the United States, Federal Germany, Belgium and Japan, and a number use dose and treatment techniques developed at the Hammersmith Hospital.

The treatment involves the use of neutrons, the particles that exist in atomic nuclei. When produced in a high-energy beam by the cyclotron, fast neutrons interact with body matter to successfully combat tumour cells resistant to X-rays and gamma rays.

The Clatterbridge cyclotron machine will be able to tackle deep-seated tumours in the stomach, pancreas and prostate—areas where surgery and X-ray treatment have a less than 30 per cent success rate. The new machine also has a special device that allows the neutron beam to be steered with precision onto the tumour. Because of its accuracy there will be less damage to healthy tissue next to the tumour.

The trials planned for the Clatterbridge machine will involve some 500 patients and should produce for the first time a definitive assessment of the value of neutrons in cancer treatment. **—B.I.S.**

Early detection saves lives

Well-known Soviet surgeon Nikolai Malinovski, recently announced in a press conference that the growth of the number of lethal cancer cases in the USSR has been stopped due to the accomplishments of national medicine. In recent years, the cancer mortality rate among men has remained unchanged, while women show a downward trend.

The Academician said that the slogan of the World Health Organisation that cancer is curable in principle and that its early detection saves life was well justified and has been confirmed by practice. The development of new drugs as well as laser and isotope therapy improve the chances of convalescence. Surgeons are now successfully performing operations which they would not dare perform earlier. This does not mean, however, that a radical cure for cancer has been found, Malinovski said.

—Soviet Features, Nov. 1984

Primary health workers can detect precancerous mouth lesions

Mouth cancer is the commonest form of cancer in South-East Asia. More than 100 000 cases are estimated to occur yearly, some 90% of them caused by local forms of betel nut and tobacco quid chewing and smoking.

Fortunately, up to 15 years may elapse before the precursor lesions become malignant. If these mouth lesions are detected in time, the disease is curable through radiotherapy and surgery. Unfortunately, however, most sufferers seek help only when they are in pain, which is an advanced symptom. By then, it is too late. A study of hospital patients in Sri Lanka showed that only a minority of all mouth cancer cases were detected early enough for cure.

A pilot project carried out jointly by Sri Lanka and WHO has demonstrated the possibility of early detection with simple technology applied by primary health workers, mainly midwives. In one year 35 such workers examined 29,000 villagers in the course of routine house visits near the ancient capital city of Kandy. They had learned in a two-day training course to check 10 sites in the mouth for red or white patches, ulcers, nodules, or tumours.

"They took the adults outside in the sunlight, sat them on a chair, and examined their mouths with two long-handled dental mirrors", explained the project leader, Dr Saman Warnakulasuriya, who is Director of the Department of Oral Medicine at Peradeniya University. "It took about three minutes." The midwives found suspicious signs in 1200 people—about 4% of those screened—and referred them for further examination. Although only about half of the people referred showed up for re-examination by medical staff at the dental school, 90% of these were confirmed to require medical care or close observation.

So capable have primary health workers proved that the project has now been extended to Jaffna and Galle, at opposite ends of the island.

—WHO Chronicle

Cervical Cancer: If treated early, cure is 100 per cent

Throughout Latin America and the Caribbean, cancer of the cervix is the most common cancer and the leading cause of cancer deaths among women.

"Approximately one in every thousand women between 30 and 35 years of age ... will develop cervical

cancer every year.", WHO's regional office for the Americas, in Washington, D. C. reports.

It takes about five years for localised cancer to develop and another ten years for "invasive", or advanced, cancer to set in. If a patient is treated at an early stage, the cure rate is virtually 100 per cent. If she is treated later, when the disease has begun to spread, it is 45 per cent.

Says Dr Jorge Litvak, Programme Coordinator for Adult Diseases: "If we detect it at the early stage, a cure is possible with minimal treatment. And that is important for developing countries. Cervical cancer responds well to radiotherapy with standard—not sophisticated—equipment adequate for treatment. In the event that surgery is required, a person with gynaecological skills can carry out the operation." According to recommendations, where the prevalence of cervical cancer is high, women who are sexually active should take a Pap smear yearly. Where the prevalence is low, they should take the test two years in a row and then every three years.

—HFA 2000

The Chronology of U.S. Warning Against Cigarettes

Warnings on cigarettes packages and advertising, required under U.S. law, grew sterner in tone in just five years, from 1965 to 1970—From the cautious, "Cigarette Smoking *May* Be Hazardous to Your Health" to the assertive, "It is Dangerous to Your Health" as the link between cigarettes and ill health became irrefutably established.

Now, along with the 1983 Surgeon General's report showing 62,000 deaths from chronic lung disease, such as emphysema, the U.S. Congress is readying even stronger alerts. Proposed are four labels to be rotated on packages and advertising. *(See box below for chronology of warnings.)*

Adopted 1965

Caution: Cigarette Smoking May be Hazardous to Your Health.

Adopted 1970

Warning: The Surgeon General Has Determined That Cigarette Smoking is Dangerous to Your Health.

Proposed 1983

Surgeon General's Warning:
Smoking by Pregnant Women May Result in Fetal Injury, Premature and Low Birth Weight.

Surgeon General's Warning:
Cigarette Smoke Contains Carbon Monoxide.

Surgeon General's Warning:
Smoking Causes Lung Cancer, Heart Disease, Emphysema and May Complicate Pregnancy.

Surgeon General's Warning:
Quitting Smoking Now Greatly Reduces Serious Risks to Your Health.

"We estimate that 80 and 90 per cent of chronic lung disease in the country is directly attributed to cigarette smoking, and thus over 50,000 of these deaths could have been prevented." Dr C. Everett Koop, the Surgeon General says. He has called for a smoke-free society by the Year 2000.

In addition, his report cites "very-solid" evidence that "passive smoking" poses a health problem to non-smokers, and especially to children. Those from smoking households have been shown to be more susceptible to respiratory diseases than those whose parents are non-smokers, the report says, leading the Surgeon General to suggest that "a parent interested in the best health of his children should stop."

Legislation making the language of warnings more precise has already passed the U.S. House of Representatives and is now being considered by the U.S. Senate. ●

—World Health, October 1984

SITUATION IN INDIA

National scheme for control of cancer

It was estimated that 3,00,000 people died of cancer every year, based on data collected by the Population Based Cancer Registries at Bangalore, Bombay and Madras under the National Cancer Registry Project of the Indian Council of Medical Research. This information was given in the Lok Sabha on 2 August, 1984.

Information on trends of cancer incidence on a national basis was not available. However, such information was available for the Bombay Metropolitan area only through Bombay Cancer Registry since 1964, according to which there had been a slight increase in cancer incidence. The age standardised incidence rates per 1,00,000 males were 137.7 (1964-72) and 140.2 (1975-78) and per 1,00,000 females were 122.7 (1964-72) and 129.0 (1975-78).

The Government had launched a cancer Research and Treatment Programme in 1975 during the 5th Five Year Plan. Under this Programme, 10 existing Cancer Institutions had been identified as Regional Centres for Cancer Research and Treatment; 24 Early Cancer Detection Centres and 25 Post Partum Pap Smear Testing Units had been set up. Under this Programme, Central assistance of Rs. 12.00 lakhs and Rs. 50,000 was also afforded to State Government institutions/voluntary organisations for installation of Cobalt Therapy Units and setting up of Early Cancer Detection Centres respectively. Apart from this, three Population Based Cancer Registries at Bangalore, Bombay and Madras and three Hospital Tumour Registries at Chandigarh, Trivandrum and Dibrugarh had been set up.

Rise in Incidence of Lung Cancer

Accurate information on the trends of lung cancer incidence on a national basis is not available. However, according to information from the Bombay

Cancer Registry since 1964, there has been a slight increase in the age adjusted incidence rate of lung cancer in males.

There is a considerable evidence from different parts of the world implicating cigarette smoking as the main cause of lung cancer.

The World Health Organisation has warned that lung cancer may acquire serious proportions in developing countries if concerted action against tobacco smoking is not initiated at the present time.

The Indian Council of Medical Research constituted a Task Force on primary and secondary prevention of oral precancerous and cancerous lesions in 1982 whose recommendations pertain to a large extent to the control of tobacco use and health education to the people against dangers of smoking. The Government of India had already enacted legislation titled 'Cigarette (Regulation of Production, Supply and Distribution) Act, 1975. The main objective of the Act is to provide restriction in relation to trade and commerce and production, supply and distribution of cigarette and for matters connected therewith or incidential thereto. A number of other measures including health education have also been undertaken.

This information was given in Lok Sabha in reply to a question in August 1984.

Integrated approach to fight cancer

Experts participating in the first international workshop on "head and neck cancer", warned that incidence of cancer in India was likely to increase because of industrialisation and other health hazards.

They pleaded for an integrated approach on a national level to control and cure the disease in the early stages. Facilities for detection and treatment should be made available at the district level to prevent the disease from assuming alarming proportions.

Participants in the international workshops held on 2 January, 1985, at New Delhi for the first time, discussed various aspects of the disease, the treatment available in the country and advances made to combat the malady.

They said that prevention was better than cure. Prevention was easier in the case of head and neck cancer by reducing the intake of tobacco and maintaining a better standard of oral hygiene.

Inaugurating the workshop, attended by over 200 Indian and foreign experts, the Union Minister for Parliamentary Affairs, Shri H. K. L. Bhagat, called upon doctors to educate the people about cancer. He said the head and neck cancer affected 1,50,000 people in the country every year. The patients mostly belonged to the weaker sections. Efforts should be made for early diagnosis and optimal treatment to patients in medical colleges and district hospitals.

Shri Bhagat urged the doctors to develop simple and cheap diagnostic tools for cancer so that they could be used by those in distant areas of the country.

Prof. B. N. Sinha of the Association of Surgeons of India, said the younger generation should be involved in the cancer eradication programme.

Dr Prem Kakar, head of the ENT department of Maulana Azad Medical College and joint programme chairman of the workshop, said the workshop would formulate a programme to fight the disease with a target to eradicate it by 2000 A.D.

He said most of the 500,000 cancer cases reported every year were beyond cure because of the advance stage of the disease. The head and neck cancer accounted for 40 per cent. to the total incidence of cancer. The percentage of the middle age people was highest among the head and neck cancer patients.

Prof. K. Shanmugaratnam, Professor of Pathology, National University of Singapore, and Director, Singapore Cancer Register, in his keynote address on "epidemology of head and neck cancer", said the incidence of this cancer was 5 to 28 per cent. of the total cancer burden in various countries. In India the percentage was higher. Mouth cancer could be prevented by stopping or cutting down intake of betels as well as cigarettes.

Dr Jatin Shah, an expert from a prestigious cancer institute in the U.S., said it was possible to cure a person. As a result of these advances, he said it was now possible to save three out of four persons and prolong their lifespan as compared to the earlier survival ratio of one out of every three.

He pointed out that it was possible to prevent cancer by using vitamin analogues which are compound pre-cursors of vitamins. They were known to prevent or retard cancer in animals. These compounds, known as Retinoids, were now being tested on human beings. Every person who has the habit of smoking of chewing betels should have a thorough check-up every year.

Dr Ashok Mehta of the Tata Memorial Hospital, Bombay, said mouth cancer was eight times more prevalent among 'pan' chewers. Smokers developed throat cancer or laryngeal cancer. According to him, most of the 75 per cent. neck and throat cancer cases were reported at a very late stage when no line of treatment was possible. △

CANCER DIAGNOSIS AND TREATMENT CENTRES IN INDIA

UNDER Cancer Research and Treatment Programme 10 Regional Cancer Centres have been established in the country. These are :

1. Chittaranjan National Cancer Research Centre, Calcutta.
2. Cancer Institute, Madras.
3. Institute Rotary Cancer Hospital, All India Institute of Medical Sciences, New Delhi.
4. Gujarat Cancer & Research Institute, Ahmedabad.
5. Kidwai Memorial Institute of Oncology, Bangalore.
6. Cancer Hospital and Research Institute, Gwalior.
7. Regional Centre for Cancer Research and Treatment, Cuttack.
8. Dr. B.B. Cancer Institute, Gauhati.
9. Cancer Wing of the Medical College, Trivandrum.
10. Tata Memorial Cancer Centre, Bombay.

Besides, the Indian Council of Medical Research have one permanent institute (Cytology Research Centre) located at the Maulana Azad Medical College, New Delhi where one of the thrust areas of work is on early diagnosis of cancers of the uterine cervix (which is the most common cancer in Indian women) and on studying the natural history of precancerous lesions of the uterine cervix using a multi-disciplinary approach.

While the first 9 cancer centres are supported financially by the Ministry of Health and Family Welfare the 10th at Bombay is under the administrative control of the Department of Atomic Energy who also support it financially.

Apart from the above there are about 142 hospitals in the country where treatment facilities for cancer are available :

ANDHRA PRADESH

1. Mehdi Nawaj Jung Cancer Hospital, HYDERABAD, Andhra Pradesh.
2. M.G.M. Hospital, Warangal, Andhra Pradesh.
3. Govt. General Hospital Kakinada, Andhra Pradesh.
4. Govt. General Hospital GUNTUR, Andhra Pradesh.
5. Govt. General Hospital KURNOOL, Andhra Pradesh.
6. S.V.R.R. Hospital, TIRUPATI, Andhra Pradesh.
7. King George Hospital, VISHAKHAPATNAM, A. P.
8. Gandhi Hospital, SECUNDERABAD, A.P.

ASSAM

9. Assam Medical College and Hospital, DIBRUGARH, Assam.
10. Gauhati Medical College and Hospital, GAUHATI
11. Dr. B. Bruch Cancer Institute, GAUHATI.

BIHAR

12. Medical College & Hospital, PATNA.
13. Medical College & Hospital, DARBHANGA.
14. Meherbai Tata Memorial Hospital, JAMSHEDPUR.

GUJARAT

15. M. P. Shah Cancer Research Institute, AHMEDABAD.
16. Civil Hospital, AHMEDABAD (H&P).
17. Seth Vadilal Savabhai General Hospital, AHMEDABAD.
18. Irwin Group of Hospital, JAMNAGAR.
19. Shri Sayaji General Hospital, BARODA.
20. Sir T. Hospital, BHAVNAGAR.
21. Govt. Hospital, RAJKOT.
22. Nathalal Parekh Cancer Hospital, RAJKOT.

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20. Sir T. Hospital, BHAVNAGAR.
21. Govt. Hospital, RAJKOT.
22. Nathalal Parekh Cancer Hospital, RAJKOT.

23. Lions Cancer Detection Centre (Trust) SURAT.
24. Civil Hospital, JUNAGADH.

HARYANA

25. Medical College & Hospital, ROHTAK.

J & K

26. S.M.H.S. Hospital, SRINAGAR.
27. S.M.G.S. Hospital, JAMMU.

HIMACHAL PRADESH

28. H. P. Hospital, Snowdon, SIMLA.

KARNATAKA

29. Victoria Hospital, BANGALORE.
30. Dowring & Lady Curzon Hospital, BANGALORE.
31. Kidwai Memorial Cancer Relief Research and Training Institute, BANGALORE.
32. J. L. N. Medical College & Civil Hospital, BELGAUM.
33. Medical College & Hospital, BELLARY, Karnataka.
34. K. Medical College & Hospital HUBLI, KARNATAKA.
35. Govt. Wenlock Hospital, MANGALORE, Karnataka.
36. Karnataka Cancer Theraputic Research Institute, HUBLI.
37. Kasturba Med. College & Hospital, MANIPAL, Karnataka.
38. Krishnerajendra Hospital, MYSORE.

KERALA

39. Medical College Hospital, TRIVENDRUM.
40. Medical College Hospital, KOZHIKODE.
41. Medical College Hospital, KOTTAYAM.
42. General Hospital, ERNAKULAM.

MADHYA PRADESH

43. Hamidia Hospital BHOPAL, M.P.
44. Shasklya Gyara Panch Trust Cancer Hospital, INDORE.
45. Cancer Hospital & Med. College, JABALPUR.
46. J. A. Group of Hospital, GWALIOR.
47. Cancer Hospital & Research Institute, GWALIOR.
48. Gandhi Memorial Cancer Hospital, REVA.
49. D. K. Hospital, RAIPUR.
50. Cancer Hospital, RAIPUR.
51. Ratten Massihi Chikitsalaya, RATLAM.
52. Chritjan Hospital Mungeli, BILASPUR, M.P.

MAHARASHTRA

53. B. Y. L. Charitable Hospital, BOMBAY-400008.
54. Tata Memorial Hospital, PAREL, BOMBAY-400012.
55. Mahatma Gandhi Memorial Hosp. PAREL, BOMBAY-400012.
56. K.E.M. Hospital, PAREL, BOMBAY-400012.
57. Bombay Hospital, BOMBAY-400020.
58. L.T.M.G. Hospital, Med. College SION, BOMBAY-400022.
59. Jaslok Hospital & Research Centre, Peddar Road, BOMBAY-400026.
60. Dr. BALABHAI Nanawati Hospt. Vile-Parle (West) BOMBAY-400056.
61. Gokuldas Tezpal Hospital, BOMBAY.
62. St. George Hospital BOMBAY
63. Central Railway Hospital, BOMBAY.
64. Medical College Hospital, NAGPUR.
65. Doga Memorial Hospital, NAGPUR.
66. Maya General Hospital, NAGPUR.
67. Sant Tukodiji Hospital, NAGPUR.
68. Sahakari Rugnalaya, NAGPUR.
69. Sasoon General Hospital B. J. Medical College, PUNE.
70. Command Hospital, Southern Command, PUNE.
71. Miraj Medical College & Hospital, Miraj, (MAHARASHTRA)-416410.
72. Wonless Hospital, M.M.C. MIRAJ.
73. District Hospital, AMRAVATI.
74. Salvation Army Hospital, AHMEDNAGAR.
75. Medical College & Hospital, Aurangabad.
76. S.R.T.R. Medical College, Ambajugai, Distt. BHIR.
77. Distt. Hospital, JALGAON.
78. General Hospital, SANGLI.
79. Dr. V. M. Medical College SHOLAPUR.
80. Danraj Giriji Hospital, SOLAPUR.
81. Distt. Govt. General Hospital SHOLAPUR
82. Shri Sidheshwer Cancer Hospital & Research Centre, Hotji Road, SOLAPUR-413003.
83. Distt. Hospital, WARDHA.
84. Mahatma Gandhi Institute of Medical Sciences, Sewagram, WARDHA.

MEGHALAYA

85. Khasi Hills Wellsh Mission Hospital, SHILLONG, Meghalaya.

ORISSA

86. Cancer Institute, S.C.B. Medical College & Hospital CUTTACK, Orissa.
87. V.S.S. Medical College Hospital, Burla, SAMBALPUR.
88. M.K.G.G. Medical College & Hospital, BERHAMPUR, Orissa.

PUNJAB

89. Shri Guru Teg Bahadur Hospital, AMRITSAR.
90. Rajendra Hospital PATILALA.
91. Christian Medical College, B. M. Hospital, LUDHIANA.
92. Daya Nand Medical College & Hospital, LUDHIANA.
93. Civil Hospital, GURDASPUR.
94. Civil Hospital, BATALA, Punjab

RAJASTHAN

95. J. L. N. Hospital, AJMER-305001.
96. P. B. Men's Hospital, BIKANER-334001.
97. S. M. S. Hospital, JAIPUR-302001.
98. M. G. Hospital, JODHPUR-342001.

99. Umaid Hospital, JODHPUR-342001.
100. General Hospital. UDAIPUR-313001.
101. Associated Group of Hospitals, UDAIPUR-313001.

TAMIL NADU

102. Cancer Institute (W.I.A.) Adyar, MADRAS-600020.
103. International Cancer Centre, Neyyoor, KANYAKUMARI-629802.
104. Institute of Child Health & Hospital for children. Egmore, MADRAS.
105. Govt. Hospital for Women & Children, MADRAS.
106. B.S.R.M. Lying Hospital, MADRAS.
107. Govt. General Hospital (Barnard Institute of Radiology) MADRAS.
108. Govt Royapettah Hospital, Madras.
109. Govt. Stanley Hospital, Madras.
110. Kilpauk Med. College & Hospital, MADRAS.
111. Govt. Brakime Hospital, MADURAI.
112. Kuppu Swami Naidu Memorial Hospital COIMBATORE.
113. Chingleput Medical College & Hospital, CHINGLEPUT.
114. Arignar Anna Cancer Institute, RAILWAY ROAD, KANCHIPURAM.
115. Thanjavur Medical College & Hospital, THANJAVUR.
116. Tirunelveli Medical College & Hospital, TIRUNELVELI.
117. Christian Medical College & Hospital, VELLORE, Tamil Nadu.

UTTAR PRADESH

118. G. B. Hospital, AGARTALA, Tripura.
119. Sarojini Naidu Hospital, AGRA
120. Kamla Nehru Memorial Hospital, ALLAHABAD, U.P.
121. Gandhi Memorial & Associated Hospital LUCKNOW, U.P.
122. J. K. Institute of Radiology & Cancer, KANPUR, U.P.
123. Sir Sunderpal Hospital, Institute of Medical Sciences, VARANASI.
124. Lovatti Hospital RAMNAGAR, VARANASI.

WEST BENGAL

125. Medical College & Hospital, CALCUTTA, West Bengal.
126. R. G. Kar Medical College & Hospital CALCUTTA, West Bengal.
127. Nilratan Sirkar Medical College & Hospital, CALCUTTA.
128. Chitranjan Cancer Hospital CALCUTTA, West Bengal.
129. Seth Sukhlal Karnani Memorial Hospital, CALCUTTA.
130. Institute of Post Graduate Medical Education & Research CHANDIGARH.
131. Medical College & Hospital, PANAJI, Goa, Daman & Diu.
132. Gosalia Memorial Hospital & Research Institute, Dona Paula, PANAJI.
133. Asile Hospital, Mapusa, PANAJI, GOA.
134. Jawaharlal Nehru Post Graduate Medical Education & Research Institute. PONDICHERRY.
135. All India Instt. of Medical Sciences, New Delhi.
136. Safdarjung Hospital, New Delhi.
137. Dr. Ram Manohar Lohia Hospital, NEW DELHI.
138. Smt. S. K. Medical College & Hospital, NEW DELHI.
139. L.N.J.P. Narayan Hospital, NEW DELHI.
140. G. B. Pant Hospital, NEW DELHI..
141. Holy Family Hospital, NEW DELHI.
142. N. R. Central Hospital, NEW DELHI. △

This information is based on a Statement placed in Parliament in reply to a question in August 1984).

(*contd. from page 100*)

needs of the community. Therefore, Block Health Administration will help the Village Health Assembly suggesting solutions to health problems and providing inputs whenever necessary. Specifically, the role of Block Health Administration shall include:

— providing preventive services such as immunisation.

— evaluating performance of village health care delivery system.

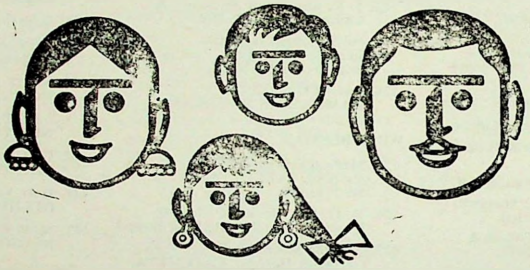
— developing a referral system from village health care delivery system to primary health centre and onwards.

— providing incentives to the village health care delivery system for the improvements in the health status of the village/community.

The approach outlined above is a simple one to increase community participation. The most important feature of the approach is that of self-reliance. Since each family of the village shall contribute something towards health of the community it is no more dependent on the government efforts and money. Because of this feature, the system is flexible also. It can be extended according to the needs of the village/community provided funds are available or the Village Health Assembly is in a position to raise the funds. Similarly the system can be developed according to the needs of the village/community which vary from community to community. But all such decisions regarding extension, etc., are to be formulated and approved by the Village Health Assembly.

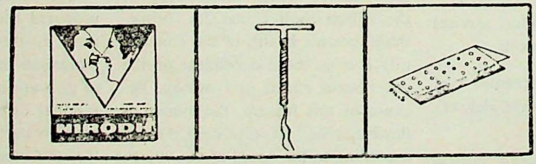
It may be pointed out at this stage that all the requirements of village health care delivery system proposed here already exist in one form or the other. The need is to reorganise them in such a way so as to give an increased role in the operational responsibility to the villagers. To start with the ad-hoc Village Health Committees already established may be given responsibility of the formation of Village Health Assembly. Then the Village Health Committee may be got elected from the Village Health Assembly and the cart may be put on wheels. △

Keep a gap of three years between two children



Choose any method

Nirodh Copper T Oral Pill



davp 84/225

BOOKS

Drugs, driving, and traffic safety, edited by R.E. Willette & J.M. Walsh. Geneva, 1983, 57 pages (WHO Offset Publication No. 78). ISBN 92 4 170078 5.

The drinking driver has been long recognised as one of the most serious traffic safety problems, and considerable attention and correctve efforts are currently directed at reducing the number of drivers whose driving is unsafe because of the effects of alcohol. But what of other drugs? The risk of accidents associated with the taking of drugs (particularly psychoactive drugs), whether obtained on prescription, over the counter, or illicitly, is widely recognized but difficult to assess in terms of its magnitude and impact on societies and public health.

The purpose of the new publication is to consider the problem associated with evaluating the effects of drugs on driving and traffic safety and to suggest standardized approaches to further work in this field.

Problems of analytical toxicology and epidemiological research are discussed, as are behavioural tests that can indicate impaired driving performance. Recommendations for systematic test procedures are put forward. There are brief sections on the role of public health authorities and on international collaboration.

One annex outlines analytical methods for detecting and identifying drugs in blood, urine and saliva samples, giving sensitivity limits for certain classes of drug. Another provides a theoritical model for the analysis of correlations between drug concentration and drug effect. As an example of a notable effort to educate the public and to reduce accidents, the last annex gives the Nordic Council's recommendations for labelling seven main classes of drug and the text of a leaflet that is given to patients when these drugs are dispensed.

Public health officials and legislators concerned with traffic safety and with the effects and interactions of drugs will find much to interest them in this book, which will also be valuable to accident-prevention offices, automobile associations, and the like.

—WHO CHRONICLE
No. 5, 1984

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STUDY OF WOMEN IN RURAL COMMUNITIES IN INDIA

Britain's Overseas Development Administration has awarded a grant of £10,000 to Professor John Durnin of the Department of Physiology, Glasgow University, towards a continuing study of women in situations of regular marginal nutrition in rural communities in India. The study, which is being carried out in collaboration with the National Institute of Nutrition in Hyderabad, is also backed by the European Community.

Prof. Durnin explained that the study is into the condition of women who are not malnourished in the recognised sense but are subjected routinely to levels of food intake which may be barely adequate and which at certain times of the year fall to totally inadequate levels. Over an 18-month period, the study will try to establish how the women adapt to these circumstances while they keep house, as well as carrying out heavy work in the fields. Measurements will be taken of their body weight, body fat, metabolic rates, and their ability to undertake the work at different times of the year. Their food intake will also be monitored.

"It is intended to discover whether, while they have to work in the fields, social arrangements are such that the women are freed from domestic chors," said Prof. Durnin. "We shall also be looking at what cultural effects there are on the communities in question when food is scarce. We hope that the results of this project, which is due to be completed in the summer of 1986, will indicate how such marginally nourished populations adapt to their circumstances, both physiologically and culturally."

— BIS

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