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OBJECTIVES

Swasth Hind (Healthy India) is a monthly journal published by the Central Health Education Bureau, Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India, New Delhi. Some of its important objectives and aims are to :

REPORT and interpret the policies, plans, programmes and achievements of the Union Ministry of Health and Family Welfare.

ACT as a medium of exchange of information on health activities of the Central and State Health Organisations.

FOCUS attention on the major public health problems in India and to report on the latest trends in public health.

KEEP in touch with health and welfare workers and agencies in India and abroad.

REPORT on important seminars, conferences, discussions, etc. on health topics.

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Articles on health topics are invited for publication in this Journal.

State Health Directorates are requested to send in reports of their activities for publication.

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HIV/AIDS in South-East Asia —An Update

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The Human Immunodeficiency Virus (HIV) which causes AIDS, came much later in South-East Asia than to other parts of the world. It has now emerged as a serious public health and developmental problem in the Region. All the countries are concerned and have expressed their commitment to combat this expanding pandemic. A total of 45,488 cases of AIDS have been reported in South-East Asia as on 1st October 1996. In March 1994 the reported number was only 5700. Thailand, India and Myanmar have reported the largest number of cases, accounting for more than 95 per cent of the cases reported from the Region.

As of 1 July 1995, 1,393,649 cumulative AIDS cases in adults and children have been reported to the World Health Organization from 193 countries since the onset of the pandemic. This represents a 19% increase from the 1,169,811 cases reported in July 1995. Allowing the under-diagnosis, incomplete reporting and reporting delay, and based on the available data on HIV infections around the world, it is estimated that over 7.7 million AIDS cases in adults and children have occurred worldwide since the pandemic began. At the same time, it was further estimated that approximately 22 million adults were living with HIV infection since the beginning of the pandemic. The continued increase in HIV infections, particularly in southern and central Africa and South Asia, is likely to accentuate the disproportionate impact of HIV/AIDS on the developing world.

Regional Situation

In the South-East Asia Region, the first patient with AIDS was reported in 1984 from Thailand. In most other countries, HIV was not

diagnosed until 1986 or later. Since then, however, HIV infection has spread extremely rapidly and WHO estimates that currently there are more than 3.7 million HIV-infected people in the Region. (see Table). Besides persons with high risk behaviours, HIV infection rates have now begun to increase in general population as well.

As of 1 October 1996, a total of 45,488 cases of AIDS have been reported in South-East Asia; in March 1994 the reported number was only 5,700. Thailand, India and Myanmar have reported the largest number of cases 41,230, 2,940 and 1,093 respectively—accounting for more than 95 per cent of the cases reported from the Region to date. Two countries namely, Bhutan and DPR Korea have not yet reported AIDS cases, although Bhutan has diagnosed persons with HIV infection.

Trend data based on seroprevalence surveys confirm the alarming increase in HIV infection rates in selected high-risk populations. In Thailand, HIV rates of 0 to less than 1 per cent among injecting

drug-users (IDU) in Bangkok were found in various *ad hoc* surveys from 1985 to 1987. However, HIV rates increased sharply to 40 per cent by September 1988 and has now stabilized almost at that level. Rates similar to Bangkok were also seen in various other provinces around the country. This wave of HIV epidemic in IDU was followed by that among female prostitutes and, by successive waves of transmission, to male clients of the prostitutes, and from them to the wives and girl friends of these men in the general population. Nationally, the prevalence rates in December 1995 were 34 per cent in IDUs, 27 per cent in low-charge prostitutes, 8.5 per cent in male STD patients and 1.8 per cent among pregnant women. Northern provinces are most severely affected. Sexual transmission contributes to 77% of AIDS cases and vertical transmission to 6.9%. The national efforts, however, seems now to be having an impact; the HIV infection rates among army conscripts have steady fallen from 4% in May 1993 to 2.7% in November 1994. The number of STDs reported nationally have also declined to the record low levels.

**AIDS AND HIV INFECTIONS IN SEAR COUNTRIES
AS OF 1 OCTOBER 1996**

Country	Reported AIDS Cases	Date of Last Report	Estimated HIV Infections	Rate per 100,000 population*
BANGLADESH	7	11/95	<20,000	<16
BHUTAN	0	11/95	75	12
DPR KOREA	0	11/95	<100	<1
INDIA	2,940	8/96	2,500,000	262
INDONESIA	104	8/96	95,000	47
MALDIVES	2	6/96	60	23
MYANMAR	1,349	10/96	350,000	737
NEPAL	53	10/96	5,000	22
SRI LANKA	64	8/96	6,000	32
THAILAND	44,471	10/96	800,000	1,345
TOTAL	48,990		>3,750,000	>258

*1996 population estimates for all countries except Bhutan are based on UN population figures for mid-1994, with annual growth rates applied as appropriate.

In a study in the North-East Indian state of Manipur, none of the 2,322 IDUs seen from 1986 to 1989 were seropositive for HIV. However, the rate increased to 54 per cent during the period October 1989 to June 1990, and at present in 1995 it is 55.8%. In Bombay, the HIV seropositivity rate among prostitutes has increased from 2 per cent in 1988-1989 to 50 per cent in 1995. The rate in Tamil Nadu in 1996 was 30%. There is evidence of increase in HIV among women attending antenatal clinics; the seroprevalence in Bombay and Manipur during 1995 were 2.5 and 1% respectively. HIV prevalence in STD clinic attenders in Bombay increased from 0.76% in 1988 to 22.8% in 1992.

In Myanmar, explosive increases in HIV seropositivity have been documented among IDUs—from 17 per cent in 1989 to 59 per cent and 71 per cent in 1990 and 1991 respectively. In addition, the rates among

STD patients have registered an increase from 1.9 per cent in 1990 to 15.9 per cent in 1991 and from 8 per cent to 15.9 per cent among female prostitutes during the corresponding period. Sequential infection noted in Thailand starting with IDUs to female sex workers, to STD patients and to the community was also observed in Myanmar. As of March 1994, sentinel surveillance among IDUs in 5 cities revealed seroprevalence rates ranging from 28% in Taunggyi to 96% in Myit-Kyeena; 13% among CSWs in Yangon; amongst blood donors increased from 0.17% in 1992 to 0.59% in 1993. Mandalay and in Yangon increased from 0.37% in March 1992 to 0.5% in March 1993. In some areas, HIV seroprevalence among samples of pregnant women has already reached 4-7% level. Overall it appears that HIV infection rates nationally among IDU have declined from 73% in 1992 to 55% in 1995.

Given the prevailing sexual behaviour and experiences in the three countries described above, there is a possibility of a similar scenario being repeated in other countries of the South-East Asia Region. Risk behaviours which promote the spread of HIV, such as injection of drugs, male patronage of prostitutes, high rates of STD and low condom usage, are present in all countries. For example, in Nepal, the HIV infection rates among sex workers and STD patients although very low, but have doubled between 1992 and 1993. In Indonesia the Government has recently estimated that 95,000 people in the country may already be infected with HIV.

Health and Socio-economic Impact

In view of the fact that heterosexual contact is the predominant mode of HIV transmission in the Region, that the rates of STD are high and that there is considerable unprotected sexual activity, continued transmission of HIV in the general population appears inevitable, unless effective measures are taken now!. Predictions about AIDS tend to be unrealistic, but the current estimate of more than 3.7 million HIV infections in South-East Asia is nearly 18 per cent of the global total, while the proportion of reported AIDS cases is less than 6 per cent. Based on the available data, estimated numbers during 1994 include 2.5 million in India, 800,000 in Thailand and 350,000 in Myanmar.

Furthermore, WHO estimates that while the annual number of HIV infections will peak in Africa by 1995, infections in Asia will continue to increase well into the early next century. By year 2000, the cumulative number of infection

would be 8-10 million and the annual numbers would far exceed that seen in sub-Saharan Africa. Given the mean progression time for initial HIV infection to develop into AIDS, it can be concluded that AIDS cases in the Region will continue to increase well into the next century, and close to 2 million cumulative cases of AIDS will occur by the year 2000.

These incidence estimates and projections are, however, contingent upon the effectiveness of current and future prevention efforts. Nonetheless, the annual toll of AIDS cases will continue to grow in the future, requiring further prevention efforts and increased medical and social services for the next several years for persons with HIV infection. In the wake of HIV pandemic, tuberculosis is beginning to increase in parts of Thailand and India.

The greatest tragedy, besides medical and health care costs, will be the loss of thousands of lives, particularly among young adults in their most productive age and infants born to HIV-infected mothers, directly affecting child survival rates. This will result in a major impact on the economy of all countries throughout the Region—in terms of direct medical and patient care costs and indirect costs in the form of absenteeism and decreased productivity. In the countries of the Region, the pandemic is likely to overstretch an already fragile health and economic infrastructure. Thailand estimates that the direct and the indirect cost of the pandemic by the year 2000 would be US \$ 9 billion.

National Plans and programmes

In response to the growing pandemic in South-east Asia, the governments in the Region have accord-

ed AIDS prevention a high priority. National AIDS committees have been established, education of health care workers and the general population is ongoing, laboratory facilities have been strengthened for screening donated blood for HIV and for the diagnosis of HIV, and priority is being given to targeted interventions and to STD case management using syndromic approach. Condoms use is being promoted including through social marketing approaches. Universal precautions against transmission through contaminated injecting equipment are being promoted. All countries are currently implementing medium-term AIDS plans (MTP), developed in collaboration with the WHO Global Programme on AIDS. These plans have established the aims, targets, strategies and activities directed at AIDS prevention best suited to each country situation. The plans were earlier primarily funded by WHO/GPA. However, given the global economic situation and resource constraints, the governments are now increasingly taking upon themselves the responsibility for AIDS prevention and care in their respective countries. Among many of the effective approaches implemented in the Region include the following:

100% Condom Use Programme in Thailand.

The most important factor relating to the rapid heterosexual HIV transmission in Thailand is the sex entertainment industry. The total number of female sex workers in the country is estimated at 100,000. It has been consistently observed that the majority of the sex workers want their clients to use condoms. However, they are unable to enforce this practice regularly because

of client refusal. In some cases, even the owners of sex establishment pressure sex workers to yield to the demand of their customers to have unprotected sex.

In order to meet this challenge, a 100% condom programme was initiated in August 1989 with the aim of promoting the use of condoms in sex establishments in Ratchaburi, a province in the central region, south of Bangkok. The principle of the programme was to gain the cooperation of the government authorities in influencing owners of the sex establishments in the province to make their sex workers to use condoms in all sexual encounters. If their customers refuse to use a condom, sex workers are to withhold service and refund those customers' money. It was important that these measures be taken by all sex establishments in the area so that it would be impossible to purchase sex services without using condoms in any sex establishment in the province.

After successful implementation in Ratchaburi, the 100% condom programme was expanded to cover neighbouring provinces from 1990. In August 1991 the national AIDS committee approved the nationwide expansion of the 100% condom programme. Since April 1992, all 73 provinces have reported the implementation of the programme to the Ministry of Public Health.

The decline in HIV infection rates among young males being recruited for army underline the impact of the 100% condom programme. In most provinces, there has been marked increase in condom use in sex establishments. At the same time, the incidence of sexually transmitted

diseases has gradually decreased from 6.5 per 1000 population in 1989 to record low levels now.

Peer Education Among Sex Workers in Calcutta

Sonagachi is one of the oldest and biggest "red light" districts in Calcutta, with 5000 commercial sex workers. A survey conducted in April-June 1992 revealed an alarmingly high prevalence of sexually transmitted diseases (STDs) among the sex workers: syphilis, 63%; vaginal candidiasis, 25%; and gonorrhoea, 13%. About 81% of sex workers are infected with one or more STD pathogens. Hardly any of the sex workers were found to use condoms regularly. The prevalence of HIV infection was extremely low, however.

An STD/HIV intervention programme was started among the sex workers in September 1992, consisting of early diagnosis and treatment of STDs, promotion of condoms and health education activities. Peer educators were identified from among the sex workers and trained for a period of six weeks. Sixty-one peer educators make house-to-house visits in Sonagachi. They are divided into 12 groups, seven of which are headed by one field supervisor (social worker). Each of the 12 groups visits seven to eight brothels daily, communicating with around 40-50 sex workers and five to six "madams". They discuss with the sex workers different issues related to STDs and AIDS, educate them regarding condom use with the help of flip charts and other materials and provide condoms according to the need and demand of the sex workers. They revisit the same brothel after six to seven days.

When this intervention programme was started only 2500 condoms were distributed throughout the month of September 1992. The use of condoms by the clients of sex workers has been rapidly increasing, as shown by a study conducted in May-June 1993. At that time 42% of sex workers were using condoms on a regular basis, compared to 1% one year previously. The prevalence of sexually transmitted disease has fallen sharply. Pimps, "madams" and brothel owners, and also youth club members are all becoming actively involved in this effort.

A review of the project conducted in October 1995 revealed that STD rates have declined steadily among sex workers since implementation of the programme and HIV infection rates continue to remain very low, around 1.4%.

WHO support for country responses

Programme Management, Advocacy and Support

During 1994-1995, WHO Regional Office participated in the review of many national AIDS control programmes which resulted in specific recommendations for further strengthening of the programmes. Assistance was also provided to countries for developing their medium-term plans as well as annual work plans for the prevention and control of AIDS.

Besides assisting countries in the programme planning, development and evaluation, the Regional Office, through its intercountry programme, has been providing assistance in the implementation of various programme activities. These include training to improve AIDS reporting and the institution of sentinel surveill-

ance of HIV infection; strengthening laboratory diagnostic capacities through technical advice and on-the-job training; promoting STD case management through syndromic approach, condom social marketing, integrating AIDS/STD education in ongoing health programmes, providing health education guidelines and materials, strengthening all aspects of blood-transfusion services; developing guidelines on counselling and home care; and facilitating the supply of equipment, reagents, condoms and HIV test kits. Last but not the least, the regional office has provided a forum each year through the annual programme managers meetings to exchange programme experiences and mutual sharing of innovative ideas and approaches suitable for the region.

To mobilize national and intercountry efforts, the Regional Office plays a very important advocacy role by highlighting the extent and potential impact of this pandemic on Asia as well as by emphasizing the need to act now! The Regional Office produced and distributed a booklet called AIDS in South-East Asia: No time for complacency, a video entitled "Facing the Challenge: AIDS in South-East Asia" and advocacy materials on school AIDS education. Various sectors are now being involved in AIDS prevention and control including NGOs and private sector in many countries. In January 1995, the Regional Office organized an intercountry meeting

to enhance the involvement of private sector in HIV/AIDS prevention and in 1996 developed guidelines to assist NGOs in their work.

In India, the Consortium of Indian Industries and in Thailand, The Thai Business Coalition on AIDS are assisting in AIDS prevention activities to be carried out by the industry. NGO activities have increased tremendously over last 1-2 years in all countries particularly in the peripheral areas. Collaboration between NGOs and national programmes and among NGOs themselves is being increased.

During 1995, technical and material support have been made by the Regional Office to ASEAN in development of their regional work programme and to Chulalongkorn University, Thailand, in a consultation on information on population movement and HIV/AIDS.

Promoting appropriate HIV prevention strategies and interventions

Since sexual transmission accounts for 80-90% HIV infections in the region, Regional Office is urging countries to focus most of the efforts and resources for prevention programme on promoting safer sexual behaviour through education of population groups through use of mass media and inter-personal methods; targeted interventions among high risk behaviour including promotion of condom use; and providing early diagnosis and treatment of sexually transmitted diseases, particularly those which facilitate HIV transmission. Although difficulty in condom promotion from religious and cultural point of view has been one of the major handicap in some countries, efforts have been made to have condoms available in as many as outlets as possible. Condom

Social Marketing (CSM) is successfully operational in many countries namely, Bangladesh, India, Indonesia, Nepal, Thailand and Sri Lanka and more recently in Myanmar. The Regional Office assisted Bhutan in conducting feasibility study on establishing CSM in that country.

In view of the association between HIV and STD and the role played by STD, particularly genital ulcer disease, in the acquisition and transmission of HIV, the Regional Office is promoting the need to strengthen STD services in the countries. Early diagnosis and treatment of STDs is being given a high priority as primary prevention measures against HIV infection. STD control is an important agenda item at annual meetings of programme managers. As a result, the programmes are now trying to focus on diagnosis of STD using syndromic approach and providing the most effective drugs at the first contact with health services. During 1995-96, the Regional Office workshops/consultation focussed on Integrated approach to STD control, Colombo, June 1995; monitoring of gonococcal antimicrobial sensitivity, December 1995; and on development of guidelines for STD management, New Delhi, May 1996. The STD training package is also being developed to assist countries. Priority is being assigned also to ensuring safe blood transfusions and blood products; meeting on the use of distance learning material for safe blood transfusion, Lucknow, March 1995.

Indeed, experiences from countries both on prevention and care must be shared. With this in mind the Regional Office convenes every year a meeting of the National AIDS Pro-

gramme Managers. In November 1995, the Regional Office invited all the AIDS programme managers in Jakarta to share their experiences in AIDS prevention and care.

HIV/AIDS Care as a part of Primary Health Care

In South-East Asia, patients with AIDS are increasingly being diagnosed and HIV/AIDS care is now becoming a major issue to be addressed in the region. To respond to this need, the Regional Office is promoting the concept of HIV/AIDS continuum of care at various levels *i.e.* institution, community and home. The concept proposes that HIV/AIDS care should be integrated with Primary Health Care and that care at all levels should be strengthened in view of the anticipated increase in AIDS cases in the future. An intercountry meeting on the continuum of care was held in Bangkok in 1993 which provided as basis for planning care approaches in the Region. This model of HIV/AIDS care is now being applied in Manipur, Bombay, as well as in Thailand.

In 1995, the Regional Office developed "HIV/AIDS Counselling: A module for trainers" which was made available to all member countries. Eight thousand copies of the popular SEARO booklet "Understanding and Living with AIDS" was also distributed for use by health care workers, NGOs as well as training institutions. The home-care handbook developed by HQ has been adapted for the regional use and distributed in Member Countries.

Laboratory Diagnosis and HIV/AIDS and STD Surveillance

The Regional Office support in the area of laboratory diagnosis

includes the assessment of laboratory capabilities in the country, provision of supplies and equipment, assistance in conducting on-the-bench training, dissemination of safety guidelines for laboratory workers, and promotion of quality assurance programmes through WHO collaborating centres. The Regional Office is promoting cost-effective approaches in HIV testing, including testing of pooled sera in population with low HIV seroprevalence, and is providing guidelines for the use of alternative testing approaches and thereby discouraging the use of Western Blot assay, which is very expensive.

HIV/AIDS surveillance data are necessary not only to determine the current magnitude of the problem and to monitor trends but also for

advocacy and planning purposes. The Regional Office has produced a guide on HIV sentinel surveillance for the programme managers. Most recently, an Intercountry Workshop on HIV Surveillance data management and use was organized by the Regional Office in Bangkok, Thailand, from 22 to 24 November 1995. The Workshop reviewed sentinel surveillance of HIV/AIDS infection in Member Countries and identified the constraints encountered in the implementation of sentinel surveillance data management. The participants used computers for data management and for estimating HIV infections.

The future role of WHO

On 1 January 1996, the Joint and Cosponsored UN Programme on AIDS (UNAIDS) became operational

al. However, WHO's role in the global fight against AIDS and the control of sexually transmitted diseases remains crucial. Our work encompasses the prevention of HIV and STDs, the safety of blood and blood products, clinical care of people with HIV/AIDS and health care related issues, and HIV and STD surveillance. WHO will continue to help countries in their national AIDS programmes, in collaboration with UNAIDS and in providing technical support in the health aspects of HIV/AIDS, not only to governmental bodies but also to nongovernmental organizations and the private sector. This support includes training, supply of HIV test kits, providing guidelines and training materials, disseminating information, and assisting in programme planning and evaluation. △

“Why should there be a stigma about leprosy any more than about other infectious diseases? Real leprosy is attached to an unclean mind. To look down upon fellow human beings, to condemn any community or class of men, is a sign of diseased mind far worse than physical leprosy. Such men are real lepers of society.”

— MAHATMA GANDHI

SMOKING SHOULD BE BANNED IN PUBLIC PLACES AND OFFICES

Eleventh Meeting of the National AIDS Programme Managers — Jakarta, 22-24 November 1995

CONCLUSIONS AND RECOMMENDATIONS

THE Eleventh Meeting of the National AIDS Programme Managers reviewed the national AIDS programme experiences in the countries of South-East Asia, and expressed concern on the continued spread of HIV in the Region. Although considerable work is going on at the country and regional level to combat the HIV/AIDS pandemic, much still remains to be done. Various experiences shared in the meeting suggest that the strategies and approaches adopted by the countries are both relevant and effective, as demonstrated by the declining trends of HIV infection and of other STDs in certain population groups in some of the countries. In order to continue our efforts and to overcome many challenges and constraints which still persist, a greater level of commitment and support for HIV/AIDS prevention and care is needed not only from the governments but also from various UN agencies and

In order to continue our efforts and to overcome many challenges and constraints, which still persist, a greater level of commitment and support for HIV/AIDS prevention and care is needed not only from the Governments but also from various UN agencies and bilateral donors. We publish here conclusions and recommendations of the Eleventh Meeting of the National AIDS Programme Managers.

bilateral donors. The following are some of the recommendations made during the meeting:

Action by Governments

(1) The strategic planning of HIV/AIDS prevention and control at country level should be harmonized with the overall national planning process with the involvement of various relevant sectors, particularly the planning commission.

(2) The initiatives for developing comprehensive and optimum annual (or biennial) work plans for the national AIDS programme activities

should be taken by the national AIDS programme in collaboration with various sectors, both within the government as well as outside, such as the NGOs; the draft plan should then be shared with the relevant UN agencies and bilateral donors for consultation and resources mobilization.

(3) The political commitment for combating AIDS is uniformly high in all countries. Unfortunately, however, this commitment does not get translated into action at the

ground level. Approaches are needed urgently to develop and implement appropriate and rational national policies on HIV/AIDS and to allocate adequate national resources towards this effort.

(4) The national AIDS programme activities should, wherever possible, be decentralized to the most peripheral level. This would require not only transfer of responsibility but also delegation of authority to community level to plan, mobilize resources and build local-level capacities. The central unit, or the national AIDS programme should assist the local authorities by providing policy guidelines, mobilizing and allocating resources, and by setting up a mechanism for monitoring and evaluating programme activities. An ongoing and continuous system of reporting and feedback between the central unit and the periphery should be developed.

(5) The involvement of various sectors such as those in the government, the NGOs and the private sector is essential to ensure a multi-sectoral response to HIV/AIDS pandemic. All relevant sectors, both governmental and nongovernmental, should be represented in the national as well as the local-level AIDS Committees and they should participate fully in the national AIDS planning and evaluation exercises.

(6) The national AIDS programme management capacity should be further strengthened in all the countries. Each programme should, at the minimum, have full-time AIDS

programme staff, and all those involved in the AIDS programme activities at the central as well as provincial levels should be trained, for example, through the AIDS programme management courses developed by GPA.

(7) The STD prevention and control should be given a high priority in all the countries; the STD and AIDS control activities should be integrated into one management structure. The primary health care (PHC) workers at various levels, both in public and private sectors must be trained in STD syndromic management as soon as possible. WHO should provide training material and assist in the training of trainers at national level. In addition, the laboratory capacity should be strengthened in the area of quality assurance, research being conducted particularly into health-seeking behaviour; the supplies of STD drugs, condoms, and IEC materials should also be ensured.

(8) Priority must be given to implementing and expanding the intervention programmes targeted particularly among populations with high-risk behaviour. The population groups which may benefit from targeted interventions should be identified through demographic and behavioural research, and this should be followed by implementing the interventions relevant to each such population group. The WHO/SEARO guidelines on IEC should be used in developing, implementing and evaluating the targeted intervention programmes. The technical and financial support available at WHO/SEARO for operational and behavioural research should be fully utilized by the countries.

Action by UN Agencies

(1) WHO should continue to provide technical support to the ministries of health and national AIDS programmes according to its constitutional mandate, and in justification of its comparative advantages.

(2) The WHO country offices, particularly those without staff designated specifically for AIDS, should as a matter of priority identify a focal point to coordinate the WHO assistance and support to the national AIDS programmes at country level.

(3) Given the widespread concern among programme managers relating to the GPA closure and uncertainties during the transitional phase, UNAIDS should urgently provide the national AIDS programmes with information on the operational aspects of its programme; how exactly it plans to function at country level and what would be its mode of operations. All efforts must be made to minimize, to the maximum extent possible, the potential disruption of technical and operational support for country-level activities during the transitional phase.

(4) The UNAIDS should clarify as soon as possible how its direct country support funds for the national programmes in the South-East Asia Region will flow and how the same will be monitored.

(5) It is strongly recommended that SEARO continues to organize the annual meeting of the National AIDS Programme Managers of the South-East Asia Region in the future too. ○

HIV/AIDS : THE GLOBAL EPIDEMIC

ESTIMATES AS OF DECEMBER 1996

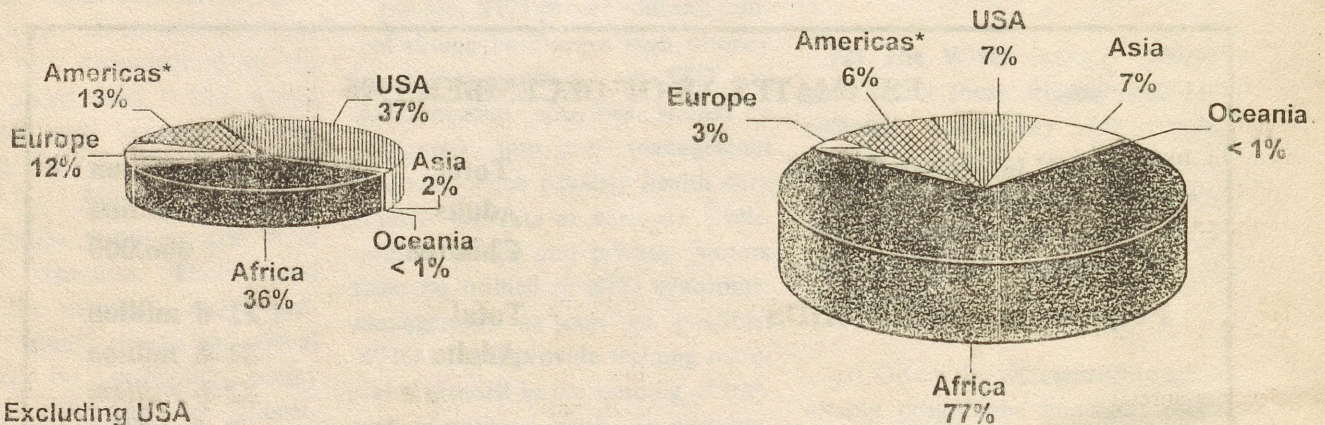
New HIV infections in 1996	Total	3.1 million
	Adults	2.7 million
	Children	400,000
People living with HIV/AIDS	Total	22.6 million
	Adults	21.8 million
	<i>male</i>	<i>12.6 million</i>
	<i>female</i>	<i>9.2 million</i>
	Children	830,000
HIV/AIDS-associated deaths in 1996	Total	1.5 million
	Adults	1.1 million
	<i>male</i>	<i>650,000</i>
	<i>female</i>	<i>470,000</i>
	Children	350,000
Cumulative HIV infections	Total	29.4 million
	Adults	26.8 million
	<i>male</i>	<i>15.5 million</i>
	<i>female</i>	<i>11.3 million</i>
	Children	2.6 million
Cumulative AIDS cases	Total	8.4 million
	Adults	6.7 million
	<i>male</i>	<i>3.9 million</i>
	<i>female</i>	<i>2.8 million</i>
	Children	1.7 million
Cumulative HIV/AIDS deaths	Total	6.4 million
	Adults	5.0 million
	<i>male</i>	<i>2.9 million</i>
	<i>female</i>	<i>2.1 million</i>
	Children	1.4 million

GLOBAL ESTIMATES : UNAIDS & WHO

Reported and estimated AIDS cases in adults and children from late 1970s/early 1980s until mid 1996

Reported: 1 393 649**

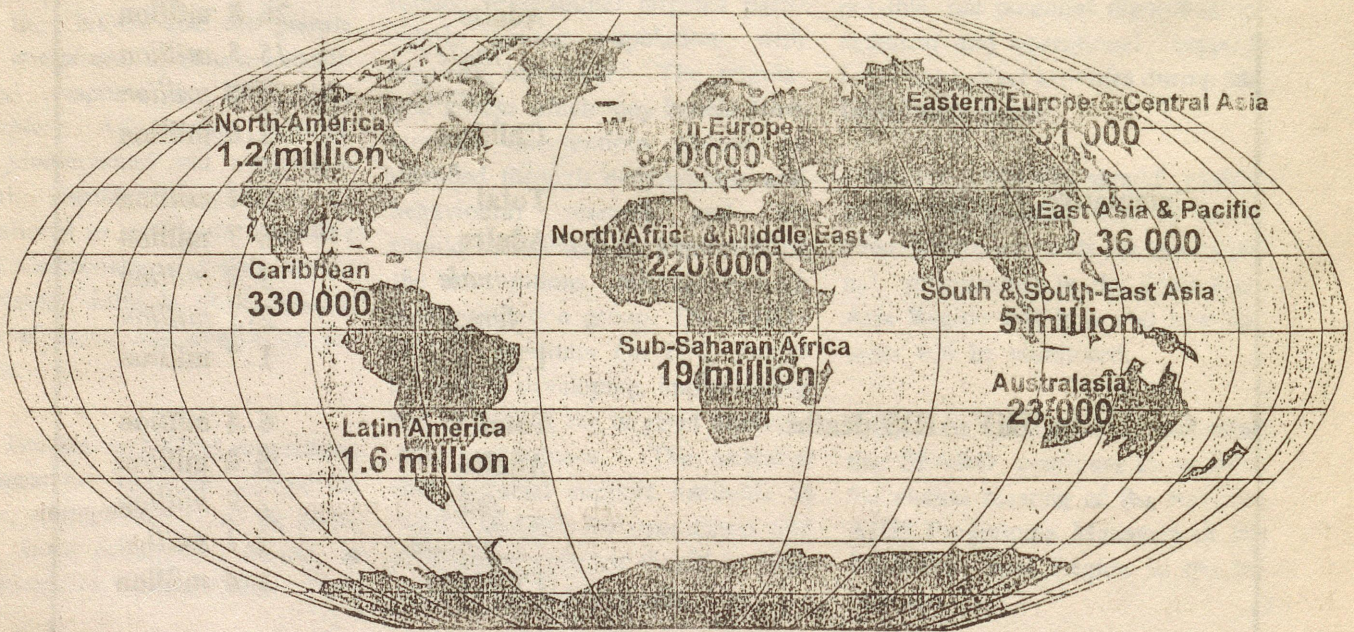
Estimated: 7.7 million



* Excluding USA

** AIDS cases reported to WHO as of 30 June 1996

Estimated distribution, as of mid 1996, of adults and children infected with HIV since the late 1970s (global total: 27.9 million*)



*Because of rounding, the figures may not tally.

TB in the era of AIDS

TUBERCULOSIS (TB), an ancient disease, continues even today to remain a major public health problem in much of the developing world. This is in part due to the continued neglect of the disease since the 1960s and to poorly-managed and ill-focused national TB control programmes. The problem is now further complicated by the relentless spread of the HIV pandemic.

Of the 3.7 million adults with HIV in the South-East Asia region, about 1.2 million are likely to be infected with TB. Given that the annual risk of symptomatic tuberculosis is between 5% and 8% among individuals who are dually infected (that is, with both HIV and latent tuberculosis), increases in new cases of tuberculosis seem inevitable. Such increases have already been observed in the United States, as well as in some sub-Saharan African countries, such as Tanzania, Zambia and Malawi. In northern Thailand, the number of reported cases increased by 9% between 1989 and 1994.

The increase in cases is likely to lead to further spread of the disease among the general, non-HIV infected, population. HIV sentinel surveillance in many countries shows that HIV rates are increasing rapidly among TB patients. In Chiangmai, 1,030 patients with tuberculosis

were tested for HIV in 1989, 6.8% of whom were found HIV-positive. By 1995, this rate had increased to 40.0%. Similarly, HIV rates among TB patients have gone up in Bangkok and Bombay.

Tuberculosis is now the most important life-threatening opportunistic infection associated with HIV in many parts of the world. In Thailand, 60% of AIDS patients have had pulmonary tuberculosis. Similar data have been reported from Myanmar (80%), India (56%) and Nepal (75%). Emergence of drug-resistant tuberculosis worldwide, due in part to HIV, is also a serious concern, although the extent of the problem is presently unclear.

These data highlight the very serious tuberculosis situation in the region, requiring urgent and effective action. In 1994, the World Health Assembly endorsed a global TB control strategy, which aims to provide adequate and efficient treatment to at least all smear-positive TB cases identified. This treatment is known as short-course therapy, and it is given over a six-month period, in two phases. In the first phase, lasting two months, four drugs are administered—rifampicin + isoniazid + pyrazinamide + ethambutol—with one dose of each drug simultaneously every day. In the second phase, over the remaining four months, only two of these drugs—rifampicin + isoniazid—are

given, with one simultaneous dose of each drug twice a week. To avoid drug resistance through partly-finished courses of treatment, this therapy should be directly supervised by a competent person. WHO advocates that all countries with a TB problem should provide such 'directly observed treatment—short-course' (known as DOTS) for all TB cases. If resources are scarce, priority should be given to sputum smear-positive cases and seriously ill smear-negative cases. The target is to cure 85% of the detected smear-positive cases and to detect 70% of existing cases by the year 2000.

The success of this strategy depends on the implementation of a TB control policy package, including commitments by governments to TB control programmes aiming at nationwide coverage, the administration of standardized short-course chemotherapy, and the establishment of a system of regular supply of all essential TB drugs. According to Dr Arata, Kochi, Director of the Global TB Programme of WHO, "the adoption of this framework is particularly urgent in countries confronted with an HIV epidemic." That such a strategy works has been demonstrated in Tanzania, where DOTS has contributed to decreased TB transmission in the community, as well as to a remarkable lowering of drug resistance. ○

—Jai P. Narain

AIDS IN CHILDREN: The Innocent Victims!

DR. MEHARBAN SINGH

Children are truly at the mercy of adults and unfortunately innocent victims of HIV infection due to no fault of theirs. They suffer due to follies and unnatural behaviour of adults. It is estimated that 10 million children would be infected with HIV by 2000 AD. Children account for 7.5 per cent of all cases of HIV infection. The author in this article discusses the clinical spectrum, diagnosis, management and preventive aspects of the disease in children.

AQUIRED immuno deficiency syndrome (AIDS), the new scourge of mankind with a lethality and magnitude greater than plague, was first reported to the Centre for Disease Control (CDC), USA 15 years ago. The patients of AIDS are doubling in number every 5 years. The disease has caused panic and pandemonium throughout the world because there is no protective vaccine and despite supportive and available antiviral therapy, the disease is invariably fatal. It is caused by human immunodeficiency virus (HIV) which is a delicate but devastating RNA retrovirus. The disease has assumed global pandemic proportions. Over 12 million adults and one million children have already contracted HIV infection, of whom two million have developed manifest AIDS and are already dead or are doomed to die. WHO estimates that every 15-20 seconds some one in the world is becoming infected with HIV and they are destined to die after a period of 5-10 years. It is estimated that 10 million children would be infected with HIV by 2000 AD. Children account for 7.5% of all cases of HIV infection. AIDS

has once again exposed the limitations and futility of medicine despite startling technological advances in the twentieth century.

The Innocent Victims!

Children are truly at the mercy of adults and unfortunately innocent victims of HIV infection due to no fault of theirs. They suffer due to follies and unnatural behaviour of adults. AIDS is a psychosocial disease which occurs due to perverted human behaviour. Among adults disease is spread through homosexuality, promiscuous heterosexual activity with multiple sex partners and use of contaminated needles by drug/substance abusers. The disease thus appears to be the divine wrath against the unnatural, socially unacceptable and forbidden behaviour of carefree adults.

Children get infected by vertical transmission of infection from HIV-positive mother to her offspring. The mother-to-child transmission risk varies between 20-50%. The risk of transmission is higher in developing countries. The risk of perinatal infection is increased if maternal infection is symptomatic, low

CD, count, p²⁴ antigenemia and lack of antiviral therapy. The infection may occur transplacentally, during the process of delivery and post-natally through breast milk. The risk of infection through breast milk though minimal is well documented.

Around 80% AIDS infections in children occur during perinatal period and the rest by transfusion of potentially infected blood and blood products to children suffering from hemophilia, thalassemia, major and other hemato-oncologic disorders. It is estimated that 30% of Bombay's female sex workers are HIV-positive. Transfusion of un-screened blood especially when obtained from professional donors carries a grave risk of infection because almost 10% of them have been found to be HIV-positive. Children are thus innocent victims of acts of omissions and commissions of their parents and care takers. In adolescent children there is an additional risk of HIV infection through infected needles among drug abusers and by unprotected and unbridled homo or heterosexual activity.

Clinical Spectrum

Perinatal HIV infection is associated with increased risk of abortions, prematurity, intrauterine growth retardation and perinatal wastage. Fetal malnutrition may occur due to maternal malnutrition and drug abuse. Early HIV fetal infection is alleged to cause an embryopathy which is characterized by microcephaly with box-like forehead, ocular hypertelorism, flat nasal bridge, oblique slant of eyes, long palpebral fissures with patulous lips. Occurrence of embryopathy is controversial and not confirmed by all reports.

The incubation period of perinatal AIDS is shorter and disease is more severe and runs a fulminant course. The normal and infected infants are indistinguishable at birth. Symptoms appear between 6 months to 18 months and most children succumb to the disease by 5 years of age. HIV causes profound irreversible damage to T-cell immunological system making the child vulnerable to suffer from recurrent infections by a variety of common and unusual pathogens. The disease is characterized by failure to thrive, protein-energy malnutrition, persistent and recurrent gastro-intestinal and respiratory infections (persistent cough), unexplained fever, recurrent bacterial infections, generalized lymphadenopathy, and hepatosplenomegaly. In view of the fact that malnutrition due to faulty feeding practices and recurrent infections are common in Indian children, high discriminatory index of suspicion is desirable to diagnose AIDS.

The clinical features which alert to the possibility of AIDS include lymphoid interstitial pneumonitis with nodular opacities in the lungs,

recurrent oro-esophageal candidiasis (thrush and swallowing difficulty), parotitis and clubbing. These children are susceptible to develop a variety of opportunistic infections especially due to pneumocystis carinii and cytomegalovirus (CMV). CMV infection may cause retinal damage and blindness. They are also vulnerable to develop disseminated tuberculosis, CNS toxoplasmosis and cryptococcosis, herpes and varicella zoster infections, histoplasmosis and cryptosporidiosis. AIDS-associated malignancies are rare in children. Terminally encephalopathy occurs in a large majority of children.

Diagnosis

Diagnosis of perinatal HIV infection is complicated because ELISA and Western Blot test may be positive in the neonate in the absence of actual infection because maternal IgG antibodies are passively transferred from the mother to the fetus through the placenta. These antibodies gradually wane off and disappear by 15 months of age. Their persistence beyond 15 months is indicative of active HIV infection of the infant. Earlier diagnosis of HIV infection can be made by demonstration of HIV-specific IgM antibodies, p²⁴ core antigen, viral culture and demonstration of HIV DNA with PCR technology. In older children and in children infected through other routes, positive results on ELISA and confirmation by Western Blot are diagnostic.

The immunological abnormalities which can be identified in children with AIDS include absolute lymphopenia, reduced CD4 counts ($< 400/\text{mm}^3$) with reduction of CD4/CD₈ ratio, elevated serum immunoglobulins. Primary immunodeficiency disorders and secondary

immunodeficiency states due to other causes should be ruled out by appropriate laboratory tests and clinical findings.

Public Health Concerns during delivery of an HIV-Positive Mother

It is unethical on the part of the health professionals to deny care to AIDS patients due to concerns of their personal safety. The health team is committed to provide tender loving care with due concern and compassion to all patients irrespective of the nature of the underlying disease but due precautions must be taken to ensure personal safety. The universal precautions should be followed in all deliveries with the philosophy that anyone could be potentially carrying HIV or HBV infection. It must be remembered that hepatitis B virus (HBV) is a tougher and 100 times more infectious than HIV. The latter is a relatively fragile virus and can be easily killed by drying, heating to 50-60°C, by bleaching solutions like 1% sodium hypochlorite, glutaraldehyde (cidex) and methylated spirit. Gloves must be worn while conducting all deliveries and when handling products of conception and the baby. Mechanical suction or oral mucus suckers which are fitted with filters should be used. Avoid mouth-to-mouth breathing and oral suction of endotracheal tube.

When it is known before delivery that mother is HIV-positive, additional precautions like wearing occlusive gowns and goggles is recommended to safeguard against splashes of blood. The baby should be given a bath with warm water in the labour room to wash off any traces of blood and amniotic fluid. The baby should be nursed along with other babies in the

nursery. There is no risk to other babies and none to the health personnel who caress, cuddle, kiss or feed the babies. Universal precautions should be followed for taking and handling specimens of blood, splashes of blood and disposal of used needles and syringes.

Psychosocial aspects

Children with AIDS and their parents need empathy and compassion in their handling while maintaining secrecy and honouring their wishes. AIDS is NOT a contagious disease and there is no need for isolation. There is no risk of infection to other family members, friends and care takers through handling, feeding, toilet care, nursing care and kissing, etc. There is absolutely no risk of transmission of HIV infection to other children in the nursery, creches and schools. All efforts should be made so that the family is not ostracized by the society due to the stigma of AIDS. Due to inevitability of fatal termination there are profound ethical, emotional, financial and time-demanding concerns during care of children with AIDS. The situation is worsened by the fact that one of the parents may be critically ill or dead. AIDS support groups should be harnessed to share each others concerns and problems. Apart from conventional hospital management team, attempts should be made to involve social workers, psychologists, dieticians, clergy, teachers and physical therapists in their holistic care. These children should be allowed to socialize and attend the normal school till they are gravely sick or when having life-threatening infections.

Management

There are no safe, effective and affordable antiviral agents or specific drugs for treatment of AIDS.

The mainstay of therapy is supportive and palliative. Efforts should be made to ensure intake of high calorie nutritious diet to prevent malnutrition. Breast feeding is recognized to transmit HIV infection (15% risk) and decision for continuation or withholding of breast feeding should be individualized on the basis of education, awareness, socio-economic status and risk of bottle feeding in a particular community or family. Apart from its nutritional benefits breast milk is known to enhance immunologic protection and reduce the risk of diarrhoeal and respiratory infections. Co-trimoxazole (or pentamidine and dapsone) is recommended for prophylaxis against pneumocystis carinii. Early topical applications of ketoconazole and ensuring oral hygiene can safeguard against thrush and candidal esophagitis. Intravenous polyvalent immunoglobulins are recommended for long term administration at intervals of every 3 weeks for boosting humoral immunity. There are no effective modulators for enhancing cell-mediated immunity. Intercurrent bacterial and opportunistic infections should be recognized early and managed aggressively in accordance with the protocol followed for other immunocompromised children. Despite all attempts the disease is invariably fatal between 2-5 years of onset. The children with AIDS and their families should be given comfort, provided holistic care and shown concern and allowed to die with dignity without any feelings of guilt and remorse.

Immunizations

Immunizations especially live vaccines should be given before the disease becomes symptomatic (ARC or AIDS). BCG and attenuated

oral polio vaccine should be avoided in children with manifest AIDS. Affected children and siblings should be given killed polio vaccine. Pneumococcal and influenza vaccines should be given to all children with HIV infection whether manifest or asymptomatic. When HIV-infected children develop serious viral infections like varicella and measles, specific immune globulins may be life saving.

Prevention

There is no protective vaccine as yet against AIDS. Routine screening of all pregnant women for HIV infection is not cost-effective and not recommended. The high risk women such as drug addicts and female sex workers should be identified and counselled. They need education and support for avoidance of pregnancy and prevention of sexual transmission. Education, counselling and serologic screening programmes should be readily available. Public education and crusade should be launched against drug abuse, dangerous sexual practices and risks posed by professional blood donors. Sex and family life education should be imparted to adolescent boys and girls in high schools to spread the message of safe sex and contraception to control both sexually transmitted diseases and population explosion. Ensuring safe health of reproductive organs and achieving balance in the population dynamics are the key issues of focus in our national MCH programme.

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Involvement of Medical College in AIDS Awareness : An Experience

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&

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The AIDS awareness campaign of Government Medical College, Nanded, has been instrumental in taking correct scientific messages on AIDS prevention to around 60 Colleges in that region. This is a success story of direct involvement of a medical college in extension of knowledge to the community, feel the authors of this article.

THE University or college education has four objectives, *i.e.*, creation of professionals, preservation of knowledge, social mission and extension of knowledge. But unfortunately the last two objectives have been neglected in most of the teaching institutions. The students as well as the staff of the teaching institutions hesitate to get involved in community work. And that is why the teaching staff as well as students never come to know the realities in the community and cannot practise the application of the scientific principles for solving the community problems.

The role of medical colleges in extension of community health care outside the four walls of the college has always remained contro-

versial. We present our experiences of direct involvement of medical students and medical teachers in creating AIDS awareness in this region of Marathwada.

Announcing the Campaign

The Govt. Medical College, Nanded has a National Service Scheme Unit. National Service Scheme (NSS) is a nationwide programme run by department of Youth Affairs and Sports, Govt. of India. The programme involves college youth in community service. The national service scheme volunteers of this institute decided to run AIDS awareness campaign for generating AIDS awareness amongst college youth of this region. The medical students prepared themselves for the campaign by organizing a two day

workshop of the students on Health Education and AIDS. In August 1994, all the colleges in this region were informed about the campaign through a circular letter and their participation was invited.

AIDS awareness programme

AIDS awareness programmes were organized for the colleges which requested for participation in the campaign. The programme consisted of a students role play on AIDS, two brief lectures of medical students on scientific and cultural aspects of AIDS and a group song on AIDS. All the presentations in the programme were in local language *i.e.*, Marathi. The contents of the programme exclusively prepared and presented by the medical-students under the

guidance of the faculty members. The medical students used various methods of communication for spreading the information on AIDS to the youth from other colleges. The programme was followed by a question answer session. In this session the medical faculty members from the departments of Preventive and Social Medicine, Microbiology, Pathology, Medicine, etc., of Govt. Medical College, Nanded answered to the queries raised by the audience students and staff.

The AIDS awareness programme is a good example of direct involvement of medical students and medical teachers in extension of medical knowledge beyond the four walls of the institute. The programme was well conceived by the youth audience as the content was communicated by the peers and was in simple language. The messages which were communicated through the programme were related to current problem of AIDS, transmission of AIDS, prevention of AIDS, and role of youth in AIDS prevention. The AIDS awareness programme was successful in taking the AIDS prevention message to more than 20 colleges in this region. Apart from benefiting the other college youth the programme had also created a sense of responsibility among the medical students.

Medical teachers trained university teachers on AIDS

The AIDS awareness activity initiated by the medical students also motivated the medical teachers in getting involved in this work of

generating AIDS awareness. A proposal of organization of training of National Service Scheme Programme Officers (Professor incharge national service scheme activities at institutional level) of Swami Ramanand Teerth Marathwada University, Nanded, was submitted to the National Service Scheme Regional Centre, Pune. (M.S.) The proposal was being approved under 'Universities Talk AIDS' programme of National Service Scheme. Govt. Medical College, Nanded, organized the training programme in collaboration with the N.S.S. unit of Swami Ramanand Marathwada University, Nanded. The four day residential training of 40 programme officers was organized from 20th August to 23rd August 1995.

The training sessions were organized as per the guidelines under 'Universities Talk AIDS' programme. A total of seven training sessions were conducted which included introductory session, HIV/AIDS, issues and facts, human sexuality, psychosocial aspects of HIV/AIDS, prevention of HIV/AIDS, communication skills and action plan development. The training sessions were facilitated by the subject experts from the departments of Preventive and Social Medicine, Microbiology, Medicine, Human Physiology, Gynaecology, Psychiatry, Venereal diseases, Pathology of Govt. Medical College and Hospital, Nanded. A total of around 20 training subsessions were organized in those four days.

In all the sessions, deliberate attempts were made to generate train-

ees participation. Most of the topics were discussed by using various methods and approaches such as group discussions, question answer session, games, posters, slide shows, video films, case studies, group exercises, concept clarification, role plays, etc. The training programme was unique in many respects. Firstly, this was one of the rare occasions that the training was conducted at some other place than the recognized NSS training centres. One time training of 40 programme officers of one University, absence of drop outs in the training sessions, involvement of medical college in organization of the training, participatory nature of training were the other characteristics of the training.

Discussion

The AIDS awareness campaign of Govt. Medical College, Nanded, has been instrumental in taking correct scientific messages of AIDS prevention to around 60 colleges in this region. This is a success story of direct involvement of a medical college in extension of knowledge to the community. The students and faculty members of the medical colleges can effectively participate in community welfare activities like this.

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YOUTH AND AIDS

—The Right Perspective

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To combat the menace of AIDS, which is slowly spreading its tentacles to threaten the very existence of mankind, a multisectoral effort has to be undertaken on a war footing. Government, non-Government organizations, mass media, education sectors—all have to gear up to fight for our survival before the silence of AIDS burgeons into a deafening noise and our bubble of oblivion breaks.

THE scourge of AIDS is perhaps one of the most formidable adversities for humanity in recent times. Its spread is perpetuated by other adversities, especially poverty and underdevelopment. Consequently, no other disease has generated so many phobias and so much funding as AIDS.

During the recent Yokohama AIDS Conference, experts noted with concern the enormous population of youth who has to be reached in context of AIDS: a staggering proportion of one third of the world's population! Besides, worldwide, more than half of the people with HIV infection are under 25 years and at least 1 in 20 adolescents has been treated for a sexually Transmitted Disease (STD).

Such alarming statistics coupled with a rising trend of early initia-

tion of sexual activity in the teens due to the praxis of early and universal marriages make the youth in developing countries especially prone to bear the brunt of this disease.

Young people often have limited information about sex and sexual development and have no access to counselling, advice, treatment or sympathetic family planning services and STD clinics. Many sexually active young people lack the skills, knowledge and confidence to use contraception, or the money to buy condoms.

Some young people are more vulnerable than others. Sexual abuse, gender inequalities, rapid changes in family and social structure as well as in their bodies have a considerable bearing on the health and development and susceptibility of adolescents to HIV/AIDS.

Even as state governments jostle with each other in promoting innovative AIDS awareness schemes, they seem to have missed out an important aspect. How to adopt Information, Education and Communication (IEC) strategies so as to reach the largest number of persons possible? And more importantly, to ensure that the recipient of the information has actually grasped whatever is fed to him. Communicating about AIDS/HIV is extremely difficult as it is necessary to discuss sexual practices, a topic many cultures would rather have left alone. It is also imperative to bring the communication to a very personal level to be effective. Herein, the acid test for the executors of AIDS programme lies in educating people to change their sexual behaviour. Only if each individual examines his/her behaviour in light of the AIDS epi-

demical and makes a positive behavioural change, can any breakthrough be made.

AIDS Education in Schools—In the eye of a storm.

Though AIDS education cannot conceptually be accepted as a mainstream programme in school education, but the issues it raises are, in no way, of lesser importance.

Many governmental and non-governmental organizations seem to have adopted a favourite hobby of talking about AIDS. But all these efforts seem to have fallen by the wayside and little headway has been made in this context in schools—this is probably due to strongly held differences about what is and is not morally accepted in educational policy.

Stating information clearly and disseminating it in a language or idiom that is understandable to the target student population are necessary, but not adequate. Students must be motivated to modify their behaviour and must have the skills to do so.

In India, the simultaneous advocacy of AIDS and Sex Education brings in the complex issues associated with both. Compounding this problem are the differing viewpoints held by the advocates of health and family welfare and those actively involved in the develop-

ment of school curricula. In fact, they have come to epitomize two different, if not opposing, cultures. On the one hand, health advocates seem to be in a hurry to push their schemes and programmes into the education sector. On the other hand, however, educationists seem to have adopted a more rigid stance, trying to incorporate these changes into the school education programme in phases gradually. Ultimately, a balance has to be struck between what is desirable and what is practical.

Classroom teaching in India is extremely formal. It has been found to be traditionally averse to rapid changes and leaves hardly any scope for innovation. In such a situation, a non-course or co-curricular approach is our best bet. It should be designed to include adequate incentives for conducting activities at different levels. This approach provides enough scope to bring in relatively more sensitive content which may not find easy integration in the routine formal school curricula.

Perhaps the optimum time when AIDS Education needs to be inculcated with the school curriculum is when our younger generation becomes sexually active. This would ensure their gradual acclimatization to the subject, so that the precarious situation of sex related communica-

tion becoming titillating, would cease to become threatening any more. The novelty would gradually wear off as the youngsters come to terms with their sexuality and a 'responsible' behaviour would probably find an ingress in its wake.

Studies conducted in 35 countries across the world also run in favour of sex education in schools. Such an education shall not result in increased promiscuity or early initiation of sexual activity, as evidenced by the results.

Conclusion

To combat the menace of this deadly disease which is slowly spreading its tentacles to threaten the very existence of mankind, a multi-sectoral effort has to be undertaken on a war footing. Government and non-government organizations, mass media, education sectors—all have to gear up to fight for our survival before the silence of AIDS burgeons into a deafening noise and our bubble of oblivion breaks.

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SWASTH HIND

Multisectoral strategy for AIDS Prevention at Community Level

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AIDS poses problems which go far beyond those traditionally faced by public health personnel (1). In particular, AIDS prevention involves the modification of sexual activity, which raises sensitive social and cultural issues. Also, during the early stages of the epidemic, when prevention is crucial, it is necessary to enhance the public's perception of risk with regard to a disease which is virtually invisible but confronts everyone with difficult questions about infection, illness and death. Pointing out the medical realities alone does not create the necessary awareness, and often leaves people with illusion that self-protection against AIDS is necessary for others but not for themselves (2).

The demand for a multisectoral strategy.

This, together with the realization that AIDS can rapidly cut into hard won gains in economic, social and health development, has led many countries to spread the responsibility for AIDS prevention to other government sectors and nongovernmental organizations. The wisdom of this is easy to see, but

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In north-east Thailand a five-act drama is broadcast on the village sound system to catalyse involvement in planning and carrying out AIDS prevention activities. Each community's own suggestions for an effective strategy are presented to the relevant government and nongovernmental agencies for endorsement and support.

building a cohesive strategy for sectors that do not usually work together has proved to be challenging, particularly when it involves community implementation and empowerment.

Multisectoral AIDS programmes aimed at changing sexual behaviour are based on two premises: first that individual and community behaviour patterns mutually define each other, second that change in behaviour happens in many stages and in many different ways. Thus interventions need to be interactive and flexible, responding to the particular needs of the community at any given time.

Application in Thailand

The multisectoral AIDS prevention strategy (MAPS) involves carrying out community-defined initiatives by means of integrated government and nongovernmental services. Thailand has highly developed infrastructure for health, education and social welfare and is therefore in a good position to implement a strategy of this sort on a large scale. At present the multisectoral strategy is being used in four provinces of north-eastern Thailand.

The work began with the coordination of communities within a *tambon* (subdistrict—the lowest administrative level) to prepare a unified strategy for AIDS prevention. Such a strategy can include requests and recommendations to the government and to nongovernmental organizations (NGOs), thus giving them an opportunity to coordinate their efforts in responding to the community's needs. A series of meetings provides a forum through which this kind of cooperation between government, NGOs and the community can be established.

Communication media are used to publicize data obtained from research and stimulate awareness of AIDS, encouraging discussion and participation in the design of a strategy. The main medium used to introduce the multisectoral strategy at community level is drama. This is particularly appropriate in Thailand, where travelling shows are an important part of traditional and contemporary cultural life. Performances are often didactic, and present parodies of Thai life in areas such as male and female roles and husband-wife relations.

An audio-drama was designed on the basis of data gathered in the north-eastern region. It represents some of the risks, precautions, local beliefs and modes of personal interaction involved in preventing the spread of AIDS (3). The drama is used as a springboard to launch the following activities.

- discussion of the drama's main points in the light of local community life and the impact AIDS could have on it;
- design of activities which demonstrate commitment to AIDS prevention and encourage people to adopt less risky behaviour;
- preparation of subdistrict-level initiatives based on strategies formulated by the community;
- finding the local resources needed to carry out community and subdistrict strategies.

Before the programme started, meetings were held between MAPS staff and representatives of the district and local government and NGOs to explain its objectives and request permission to proceed. Participants included members of the provincial AIDS prevention and control committees of the Department of Health and representatives from the Departments of Education and Community Development. Officials endorsed the project and made suggestions on how to coordinate it. Provincial officials also wrote letters requesting cooperation from district and subdistrict government personnel.

The MAPS programme is carried out in five stages: a pre-drama subdistrict meeting; a drama week in the communities; a post-drama community meeting to discuss a community AIDS strategy; a post-drama subdistrict meeting to present and consolidate the strategy; and implementation of the strategy.

Pre-drama subdistrict meeting

The meeting is aimed at preparing community leaders such as the village head, volunteer health workers and women's representatives to conduct the programme in coordination with project staff and subdistrict officials from the departments of public health, educa-

tion and social development. The meeting also provides a forum in which practical decisions and arrangements can be made for conducting the drama in the communities. The main points of the drama are reviewed, and instructions are given on how to present it. The objectives of the community meeting after the drama are also reviewed. Practical details to be covered include setting the time of day for playing the tape of the drama, deciding where to place the posters about it, ensuring that the community sound system is in working order,

Community members had named brothels and cattle auctions as local HIV-risk situations, and certain festivals at which commercial sex work took place, as well as instances of intravenous drug use among young men.

and scheduling the post-drama subdistrict meeting. Community leaders are invited to sign an agreement outlining the steps and responsibilities each of them and the project team are to take. This meeting thus begins the collaborative process of planning and carrying out the MAPS programme.

Drama week

A week-long programme is conducted in each community. It consists of an audio-drama entitled *On the brink* in five acts (one cassette for each act) which are broadcast, one a day, from Monday to Friday over the community public address system (which most rural Thai communities have). Two posters, illustrating characters and interesting topics from each act, are put up each day at a common meeting place (10 posters in all). The posters include questions aimed at arousing interest and encouraging discussion of the major points of the drama.

The drama is focused on the needs of married women in rural north-east Thailand in relation to AIDS prevention, and shows how men and rural people in general are involved. It reflects local lifestyles and risk scenarios, using data obtained earlier from surveys on knowledge, action, beliefs and practices, and group discussions held in 18 randomly selected

communities in Khon Kaen Province (3). In the last scene, the main characters realize that AIDS is a problem for the community as a whole and that residents should work together to reduce risky behaviour.

Community meetings after the drama

The broadcasting of the drama is followed by a community-wide meeting. Depending on the wishes of the community leaders, the project staff provide whatever help is needed to plan and facilitate the discussion or actually conduct the meeting. The participants are encouraged to raise questions and concerns about AIDS transmission, identify areas of risk in their community, and discuss ideas about how to reduce the risk of infection. A list of ideas for possible activities is provided to help stimulate discussion. Information produced by these meetings is used to formulate a "community AIDS strategy".

Post-drama subdistrict meeting

At this meeting the strategy proposed by each community within the subdistrict is presented to subdistrict and district officials responsible for public health, education and development. The purpose is to consolidate the community strategies and with the help of local NGOs and MAPS staff, prepare a working document for the sub-district which can be presented to government and other funding agencies. The objectives of this meeting includes reviewing the questions asked about AIDS, reviewing and combining the community strategies, organizing a working party to formulate proposed activities, and setting time-lines and budgets. After the meeting, a document is produced, summarizing the plans and recommendations that were made. Recommended activities can be for individual communities or groups of them, and may require support from local health centres, district hospitals, local schools, and development agencies.

Implementing the strategy

Three teams are formed to carry out the multisectoral AIDS preven-

tion strategy and maintain momentum:

- Team 1 (province level) consists of senior personnel who involve the relevant district and provincial authorities in setting up the project and acting on the subdistrict working document.
- Team 2 (subdistrict level) carries out the meetings before and after the drama to unify and motivate local leaders, organize the distribution of the cassettes and posters, facilitate the community meetings, and ensure that the subdistrict produces a document that can be acted on.
- Team 3 (community level) coordinates and documents AIDS prevention activities arising from the meetings, encourages the community to carry them out, and evaluates implementation on the basis of participation level, number of activities carried out and their impact in terms of behaviour change.

Implementation

To prepare the meetings for the subdistrict leaders, MAPS staff visited all 43 communities in the four subdistricts. Leaders were invited to the pre-drama subdistrict meeting and given a document outlining the steps involved in participation, the process and the expected outcome of the programme. A MAPS technician then visited every community in the subdistrict to prepare the second system for the drama week.

The subdistrict meetings were well attended by district health, education and development officials, community leaders, members of the newly formed AIDS control committees, and NGOs staff. The heads of all 43 communities gave permission to proceed, and signed a formal agreement to participate in the programme.

Most of the community meetings after the drama were held in the evening and lasted for about 90 minutes. They were conducted in the local Lao-Thai dialect and followed a standard format, opening with games and a quiz on AIDS with small prizes, to en-

courage participation in the discussions, which took place in large and small groups. The turnout was encouraging, ranging from 60 to 220 people per meeting, and participation was lively. Many of the meetings were attended by staff members of Plan International, an NCO focused on the needs of children. Information on the sources of risk and proposed activities was recorded on large sheets of paper as the suggestions were made. After the meetings, field facilitators supplemented this information by means of informal discussions with younger adults and those in sections of the community whose views had not yet been expressed.

The staff then analysed and summarized the data they had collected from the meetings and other discussions, and prepared a document

AIDS is a disease which is virtually invisible but confronts everyone with difficult questions about infection, illness and death.

indicating the local HIV risk situations and preventive activities that had been suggested. Community members had named brothels and cattle auctions, and certain festivals at which commercial sex work took place, as well as instances of intravenous drug use among young men. Their willingness to point out these potential sources of HIV infection was seen as an indication that they understood how serious the problem was and were willing

Pointing out the medical realities alone does not create the necessary awareness, and often leaves people with the illusion that self-protection against AIDS is necessary for others but not for themselves.

to do something about it. Initially, the document was distributed to community leaders, district officials, field staff of Plan International, and representatives of the district AIDS Prevention Committees.

The document was then used in the second meeting of subdistrict

leaders, where community leaders reported on local risks and prevention strategies. These planning meetings were well attended by the relevant officials and representatives. In all subdistricts, improvement in the distribution of condoms was seen as the first priority. Open and free availability was recommended. The leaders felt that the presence of commercial sex workers at festivals could not be stopped in the short term, but that the danger of this practice could be publicized and condoms made easily accessible at these times. They also felt that women with partners who travelled should have ready access to condoms and be given help in developing sexual negotiation skills.

Government representatives agreed to work with subdistrict leaders to improve the condom distribution and supply service. Instead of the current practices of making condoms available free of charge but only during government officers' hours, the planning groups suggested making them available wherever alcohol was sold. At the end of the sub-district meetings, an AIDS implementation committee was elected, to coordinate the AIDS prevention activities carried out by government and NGO staff in the subdistrict.

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HIV — A few perspectives

DR C. SHYAM

The very idea of presenting this article is to stimulate the Potential researchers, says the author. In view of the recent WHO estimates of HIV infected cases in India, it is pertinent to use all possible devices to combat the problem. Also according to an estimate with the type of drugs described, the treatment costs are reduced by eight times. It should be remembered that AIDS is a medical disease with social, ethical, political and economic implications. It needs a multipronged approach and only a few perspectives are given.

FIRST reported in the US in 1981 as an unique illness affecting young, healthy homosexuals (Gottlieb *et al.*, 1981; Friedman-Klein *et al.*, 1981), the disease since been identified as acquired immunodeficiency syndrome (AIDS). The high mortality and no known cure so far has led to hitherto unforeseen scare as well as concern among public, professional as well as public health managers. Also by the time the first cases of AIDS were recognized, the Infection had already spread very widely in a pandemic form (Barries, 1986). In the absence of any vaccine or proven drug, surveillance and health education are the only tools available to check the spread of this infection (Malaviya, 1991).

Until recently it was thought that pathogenic retrovirus infections were inherently untreatable both by scientists and clinicians. Most of the measures are directed towards symptomatic relief and in the control and treatment of secondary problems arising out in HIV infected persons. However, rational therapy now looks possible due to the discovery and the ability to grow the virus in large quantities and the development of *in vitro* techniques to find drugs that inhibit the replication of HIV (Mitsuya *et al.*, 1984; 1985; Ostertag *et al.*, 1974).

Anti-HIV agents

The knowledge about the HIV viral replication cycle has helped understand the possible sites of intervention and control (De Clercq, 1989; Hirsh, 1989; Broader, 1989). Many anti-HIV agents are expected in the near future (Broader, 1988; 1989; Clumeck and Hormans, 1988). Among the most promising compounds identified are nucleoside analogues, the DNA chain synthesis terminators like azidothymidine (AZT, 3' azido-2', 3'-dideoxymidine). AZT is also the first drug to reach the clinical trial stage to be later officially released as an anti-HIV drug (Broader, 1989). AZT was found to reduce the morbidity and mortality associated with severe HIV infection (Yarchoan *et al.*, 1986; 1987; Fischl *et al.*, 1987). There are other dideoxynucleosides as well which are now in various stages of clinical testing besides other substances that act at various stages of HIV's replicative cycle (Yarchoan *et al.*, 1983).

Among the other promising agents identified as anti-HIV agents, D-penicillamine is also being tried and tested. Extensive investigations have been done on the mode of action of this compound as an anti-HIV agent (Chandra *et al.*, 1990). Their results suggest that inhibition

of transactivation may be the molecular mechanism involved in the inhibition of HIV-1 replication by D-penicillamine. Some clinical trials have also been conducted in Mexico (Estrada *et al.*, 1991). Washington University School of Medicine (Prof. Schulof), Moscow, CIS (Dept of Immunology, Prof. Khaitov) and Frankfurt (Prof. Sledentopf) (Personal communication by Dr Chandra to Prof. Malaviya).

However, the number of patients included in the study by Estrada *et al.*, (1991) the only published study to our knowledge examined is rather small—only 14 patients (8 AIDS and 6 asymptomatic). The results are nevertheless encouraging with the patients who tolerated D-penicillamine showing greater survival as compared to those without antiviral therapy (Estrada *et al.*, 1991). We thereof decided to study the effect of D-penicillamine in a large number of HIV patients.

REVIEW OF LITERATURE

Every since the reports of Gottlieb *et al.*, (1981) and Friedman-Klein *et al.*, (1981) and the subsequent world wide concern on HIV infection AIDS research has received perhaps the greatest attention by researchers in modern day science. Plenty of reports have appeared on

nearly every aspect of AIDS and HIV infection from all corners of the world (see for details: Malaviya, 1991; Pinching *et al.*, 1988; De Vita *et al.*, 1988; Levy, 1989 a & b Broader, 1987).

After intensive investigations at Pasteur Institute led by Luc Montaignier (Barre-Sinoussi *et al.*, 1983). Abraham Karpas at Cambridge, UK (Karpas, 1983). Paul Feorino at CDC, Atlanta (Roch, 1987) and Levy, at San Francisco (Levy, 1984) the virus which is the causative agent is named as "Human Immunodeficiency virus" (HIV) (Anonymous, 1986). Later investigations by Robert Gallo and his team at the National Institutes of Health, Bethesda (Papovic *et al.*, 1984; Gollo *et al.*, 1984; 1986; Shaw *et al.*, 1988); and others (Koch, 1987; Hoxie, 1987; Haseltine and Wrongstaa 1988; Essex, 1988; Melby, 1986) have shown that HIV is a member of the Lentivirinae subfamily of human retroviruses. Retroviruses have the capacity to convert their RNA into DNA with the help of an enzyme called reverse transcriptase. Until recently two subtypes of HIV namely HIV-1 and HIV-2 have been isolated from patients with AIDS. Early this year, virologist Gerald Myers of Las Alamos National Laboratory has reported that strains of HIV seems to cluster in at least five-possibly more-distinct families not just western and African groupings that researchers have accepted for nearly a decade (Sternberg, 1992). HIV-1 is identified as the etiological agent of AIDS epidemic in Central and sub-Saharan Africa, USA, Western Europe and most other countries, including India (Malaviya, 1991). The causative agent of AIDS in West African countries

including Guinea-Bissau and Cape Verde and others is HIV-2 (Malaviya, 1991).

The virion: The HIV has been studied in depth (see Gallo, 1987) and extensive information is available on the composition of the viral surface, on the etiopathogenesis including the entry of the virus, heterogeneity of HIV, the viral cycle, cytopathic mechanisms and the role of co-infections (Malaviya, 1991).

The HIV is a retrovirus but differs from most known animal retroviruses in the complexity of genomic organization. It has like other lentivirus, one set of structural genes for the viral structural proteins. The other set of structural genes code for the regulatory molecules. There are three structural genes *viz.*, *env*, *gag* and *pol* which code for viral envelope glycoproteins, viral core proteins and the viral reverse transcriptase, respectively.

There are at least 4 viral genes which code for regulatory proteins which regulate and control the HIV replication. The major genes *tat* and *rev* seem to regulate events, than enhance virus replication. Also, the gene *tat*, appears to play a central role in viral gene expression and replication (Arya *et al.*, 1988; Dayten *et al.*, 1986; Fisher *et al.*, 1986; Goh *et al.* 1986; Meusing *et al.*, 1987; Emorman *et al.*, 1987; Rice and Mathew, 1988). *Tat* is also essential for the replication of HIV-1 and therefore provides a suitable target for drug design (Chandra *et al.*, 1988).

The transactivator is the Protein polypeptide is HIV of the man in product of the gene-*a* 15 kDa polypeptide of the *tat* gene-*a* 15 kDa polypeptide in HIV infected cells

with only 56 amino acids for its activity. According to Chandra *et al.* (1990) the potential therapeutic intervention stages for the antiviral chemotherapy of AIDS are stages in reverse transcription and during the stage of transactivation.

The transactivation therefore looks like an ideal target for potential anti-HIV agents in AIDS therapy. D-penicillamine acts as an inhibitor of transactivation of the HIV-1 virus. Being a cysteine analogue, D-penicillamine is known to interact with cysteine-rich protein (Chandra and Koch, 1975; Wacker *et al.* 1976; 1977). HIV has two binding sites which interact with DP to form a stable complex. The interaction of D-penicillamine with cysteine-rich proteins, and its chelating potential prompted Chandra and Sarin (1986) to examine its effect on the replication of HIV-1.

Treatment Schedules

In their study Estrada *et al.*, (1991). DPA at a dosage of 600-1200 mg/day was administered in 20 asymptomatic and 20 patients with opportunistic infections. They were clinically evaluated (including laboratory analysis) every month for a total period of 16 months. At the end of the study there was no mortality of the patients; of the 14 asymptomatic patients only 3 progressed to AIDS; 2 of the 3 are still with DPA. When HIV culture was done in 11 patients, 5 of them were negative at 4 and 16 months of treatment. However, the 6 patients with positive culture are clinically stable. The authors therefore concluded that patients who tolerated DPA had greater chances of survival as compared to those without the anti-retroviral therapy ($P < 0.05$).

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PRACTISING VOLUNTARY BLOOD DONATION

RANJANI SAXENA
KHRIST ROY &
AVTAR SINGH DUA

Irritated doctor to a relative: 'What kind of a husband are you? Can't you donate blood for your wife? I refuse to treat her if none of the relatives donate blood and no, you can't buy blood from outside. It's not allowed in a government hospital'.

Private practitioner to a patient: 'Amma you need a blood transfusion. You will be admitted to my clinic for a day, it will not cost you much, but yes, you will have to buy blood and that will cost you Rs. 900!-'.
The above situation may be familiar to most of the health care practitioners. Such instances are common sight and it wouldn't be a surprise if each one of us has experienced it at one time or the other. Doctors usually find blood donation and issues related to it difficult to manage. Not only does the health professional need to be oriented towards healthy blood donation practises but also made aware as how to implement the same.

As against the estimated needs of 40 lakh units of blood annually, India produces 19.5 lakh units. Approximately 29% of this blood

comes from professional donors, therefore, there is an overall shortage of blood and whatever is available is of dubious quality. Under such circumstances we may well ask what are the issues related to blood donation and what are the problems we face? To find solutions to these questions an understanding of the blood donor systems is essential.

Blood donor systems

There are mainly three blood donor systems. These are:—

1. Remunerated/paid/professional/commercial donor system,
2. Replacement/family donor system.
3. Voluntary/non-remunerated/unpaid donor system.

In the *commercial donor system* blood is donated in lieu of money or other rewards. The donors donate regularly and solicit a market for their blood. They can't be called donors in true sense as they are motivated by what they receive rather than by a wish to help others.

In *family donations* the blood needed by a patient is supplied by one or more donors from within the patient's own family. Alterna-

tively the family donates the same quantity of blood as that given to their relative.

In the *voluntary system* the donors receive no payment in the form of cash or kind and donate blood with a primary motive of helping an unknown recipient. Small tokens of appreciation such as cards/certificates, light refreshment after donation are not considered as payment or substitute for cash.

Merits and demerits

Commercial donors: They usually come from lower socio-economic strata and penury drives them to sell blood. They may be unhealthy, undernourished or at risk of transfusion of transmissible infections. They may be donating more frequently hence risking their lives and supplying sub-standard blood. Commercial donation should be discouraged and routed out as it undermines the voluntary system which is the foundation of safe blood supply.

Replacement donors: Though use of such donors can be useful in meeting the need for blood where voluntary non-remunerated donors are not available. This system may even form a basis for developing a panel of voluntary blood

donors. Sadly though this has worked the other way round in India.

Since finding a replacement donor in the family puts an additional pressure on the relatives—they may seek a donor who is ready to pose as a relative and donate blood for money—equating this system to the commercial donation.

Voluntary donors: These donors are not under any pressure and hence are the safest. They can be motivated to become regular donors which would mean maintaining adequate supplies of blood. They can be educated to be a safe donor by avoiding high risk behaviour, and to defer from donating if they were to indulge in risk behaviour or exposed to a transfusion transmitted disease. Such self deferral is a healthy blood donation practice. Both sufficiency and safety of blood is more likely to be assured in the voluntary system.

Safer evolution of donor systems

As the demerits of a professional donor came into focus and the quality of his blood was proved to be unfit for transfusion, voluntary donation began to be promoted and implemented. Today voluntary

donation is almost universal in the developed countries, but not so in the developing countries. Similarly in India we have failed to universalise voluntary donation. To uproot the evil of professional donors we have promoted a lesser evil of replacement donor. The increase in proportion of replacement donors has been much greater than that of voluntary donors in the recent years. Media reports time and again have focused on how professional donors donate blood in the garb of replacement donors and donate blood in voluntary donation camps so that they can exchange the volunteer cards for money from some needy relative.

The need of the day is to universalise voluntary donation, to replace each replacement donor with a voluntary donor. *This can't be achieved by conducting a few more voluntary donation camps* but by systematic approach to the problem, the steps of which would be:

- * Mass awareness, including re-orientation of the health professional regarding blood donation.

The need for blood donation.

Actual procedure of donation.

Who can donate.

Who can't donate.

What is high risk behaviour and how it effects the quality of blood.

Disadvantages of unsafe blood.

- * Identification of local healthy volunteers and recruitments of such donors into the donation programme of each blood bank.
- * Retention of such donors into the programme on a regular basis and promotion of self deferral.

If each donor were to donate once a year then India would need only 4 million donors or in other words less than 1% of its population each year to fulfil its needs of 40 lakh units of blood per annum. It should not take much efforts to motivate and select one volunteer from a community of 100 if the levels of awareness created could be high and sustained thereon. It's time to conduct a situational analysis of our existing donor safety strategies and strive to achieve voluntary blood donation in true sense. ○

END 1996 GLOBAL ESTIMATES

Persons living with HIV/AIDS	22.6 million
New HIV infections in 1996	3.1 million
Deaths due to HIV/AIDS in 1996	1.5 million
Cumulative number of HIV infections	29.4 million
Cumulative number of AIDS cases	8.4 million
Cumulative number of deaths due to HIV AIDS	6.4 million

UNAIDS - Joint United Nations Programme on HIV/AIDS

MALNUTRITION

—A Critical Determinant of Progressive Forms of Tuberculosis

DR P. BHASKARAM

TUBERCULOSIS is a global health problem causing significant morbidity and mortality. As per WHO estimates in early nineties, nearly a third of the world's population is affected by tuberculosis, with around 90% belonging to the developing world.

Tuberculosis is an ancient disease known to be endemic in animals from the palaeolithic period. However, in man, the disease followed development of agriculture and group living. The infection was very severe running a rapid and fatal course when the population was absolutely susceptible. It however got largely modified over a period of time with acquisition of natural resistance by the population following continuous exposure to the infection. Apart from the microbial virulence and the level of host's innate resistance, many environmental factors seem to influence the course and prognosis of tuberculosis.

Malnutrition and Tuberculosis

Several epidemiological, experimental and clinical studies indicate a close association between malnutrition and tuberculosis. World literature points to higher incidence of deaths due to tuberculosis during times of food scarcity either due to natural or man-made calamities. Reversal of the effects following availability of food further supports the association. Clinical studies also point out such an association between severe protein energy malnutrition and tuberculosis in children. These observations,

however, identify only the association between the two conditions and do not establish the causal relationship.

Results obtained from controlled studies, carefully designed to impose nutrition stress among a number of species of experimental animals have helped in establishing the role of malnutrition *per se* on the incidence and progression of tuberculosis. The difficulty in extrapolating the results from animal studies to humans, however, has left the issue of the role of nutrition in tuberculosis a much debated topic. Further, there is no sound scientific evidence to prove or disprove the additional benefits of diet in patients receiving antitubercular chemotherapy.

Magnitude in India

Protein energy malnutrition (PEM) is still widely prevalent among Indian children. Recent surveys carried out by the National Nutrition Monitoring Bureau (NNMB) indicate that nearly 10% of the preschool children enjoy normal nutritional status while the rest suffer from different degrees of malnutrition. Children with severe malnutrition constitute nearly 9% and 1-3% exhibit clinical signs of kwashiorkor/marasmus. Even among adults, nearly 50% are found to suffer from chronic energy deficiency as indicated by their body mass index (BMI).

The problem of tuberculosis also is of high magnitude in India. There are at least 1 million new cases of tuberculosis causing nearly 10,000 deaths every year. These figures represent only sputum positive cases

of tuberculosis and a number of cases that are sputum negative for mycobacterium tuberculosis and also cases of extrapulmonary tuberculosis remain unreported. Similarly, there are no true estimates for childhood tuberculosis, perhaps due to the paucity of specific diagnostic criteria.

Immunology and evolution of tubercular lesions

Tuberculosis is a chronic necrotizing infection caused by mycobacterium tuberculosis. The clinical manifestations of the disease are the result of a balance between the host response and bacterial virulence. Being an intracellular infection, it predominantly evokes cellular immune responses. On recognizing the specific mycobacterial antigen, T cells become sensitized and release the immune modulators (lymphokines) to regulate macrophage function. Activated macrophages act as antigen presenting cells and execute the direct phagocytic and bactericidal effects on mycobacteria. The specificity of the immune response, however, rests with the T cell and not the macrophage. Both, the CD₄⁺ and CD₈⁺ T cell subsets are important in the protective response to mycobacterium tuberculosis. Recent studies suggest a role for a small proportion (10%) of circulating T cells which bear γ and δ chains instead of α and β in raising protective immune responses specific to mycobacterial antigens.

Macrophages process the antigen and function as effector cells in cell mediated immune responses. Lymphokine activated macrophages are responsible for phagocytosis and

bacterial killing. Apart from lymphokines, calciferol appears to activate macrophages very effectively. Though macrophage activation is responsible for control of infection, certain secretory products of activated macrophages like tumour necrosis factor ($TNF\alpha$) cause systemic manifestations like fever, weight loss, tissue necrosis etc., which are characteristic features of tuberculosis. Humoral immunity does not appear to play any significant role in the natural defense against tuberculosis. Individuals with defective cellular immunity are much more susceptible to mycobacterium tuberculosis and are more likely to have a disseminated form of tuberculosis.

Immune responses in severe PEM

The adverse effects of severe PEM on various facets of immune response are well documented. Children subjected to acute short-term or chronic nutritional stress exhibit deficits in both innate and acquired immune responses. Cellular immune responses executed by T cells and macrophages are particularly deficient. Total number of circulating T cells was depleted with predominant decrease in CD_4^+ cells. Several investigators have shown impaired proliferation and production of lymphokines particularly gamma interferon ($IFN\gamma$) by T cells on *in vitro* stimulation with mitogens.

Detailed investigations on macrophage integrity revealed impaired mobilisation of macrophages to the sites of inflammation and reduced phagocytosis due to lowered levels of opsonins. There was a decrease in production of interleukin-1 (IL-1). Such immunocompromised hosts particularly with im-

Fig. 1

ASSOCIATION BETWEEN NUTRITIONAL STATUS AND SEVERITY OF TUBERCULOSIS IN CHILDREN

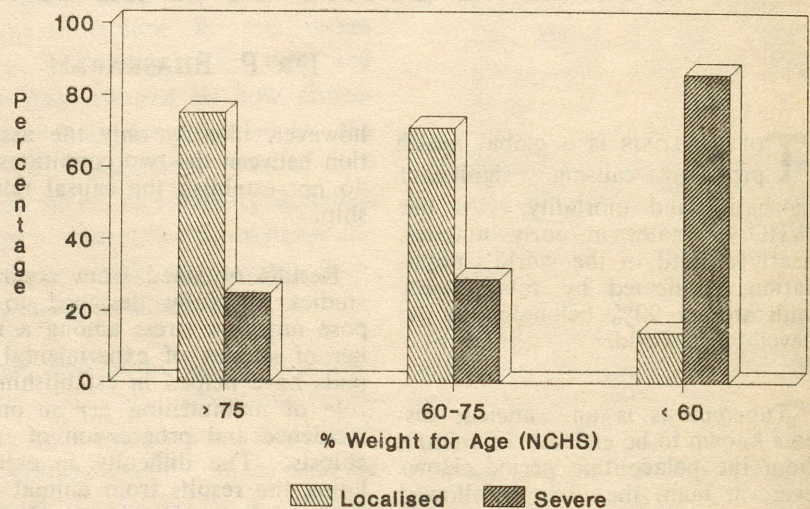


Fig. 2

CMI ACCORDING TO NUTRITIONAL STATUS AND SEVERITY OF INFECTION IN CHILDREN WITH TUBERCULOSIS

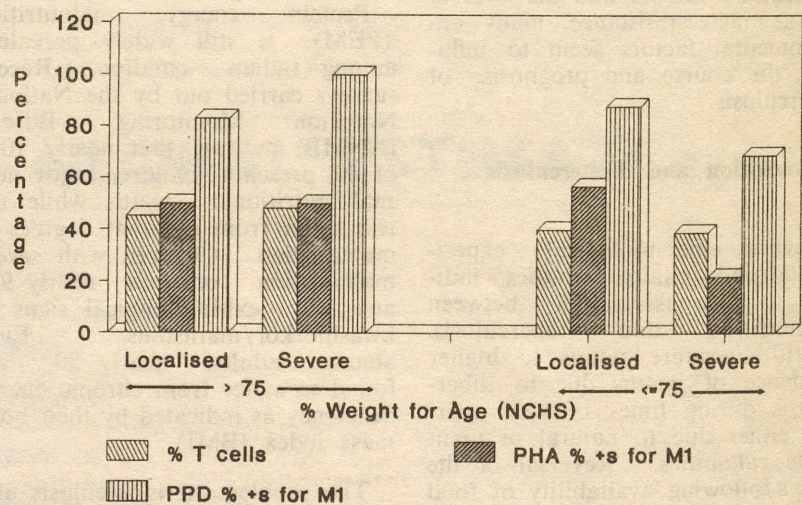


Fig. 3
PHAGOCYTOSIS AND KILLING OF $H_{37}RA$ MYCOBACTERIA BY MACROPHAGES IN TUBERCULOSIS

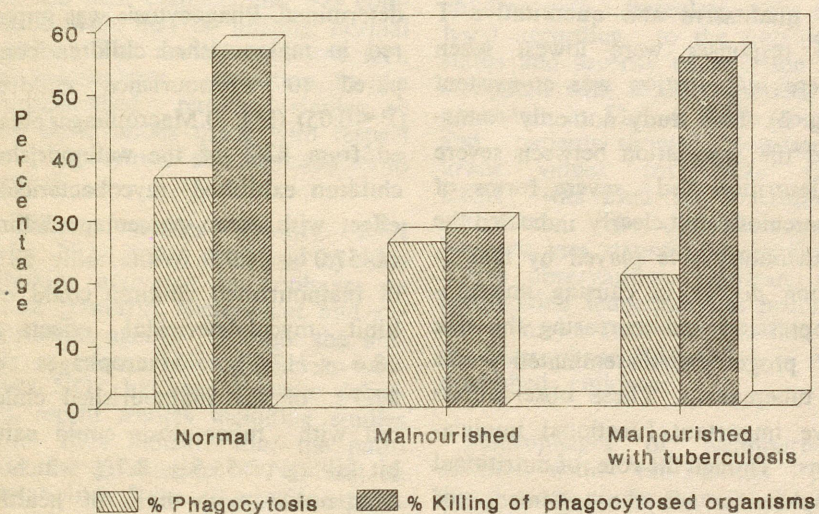
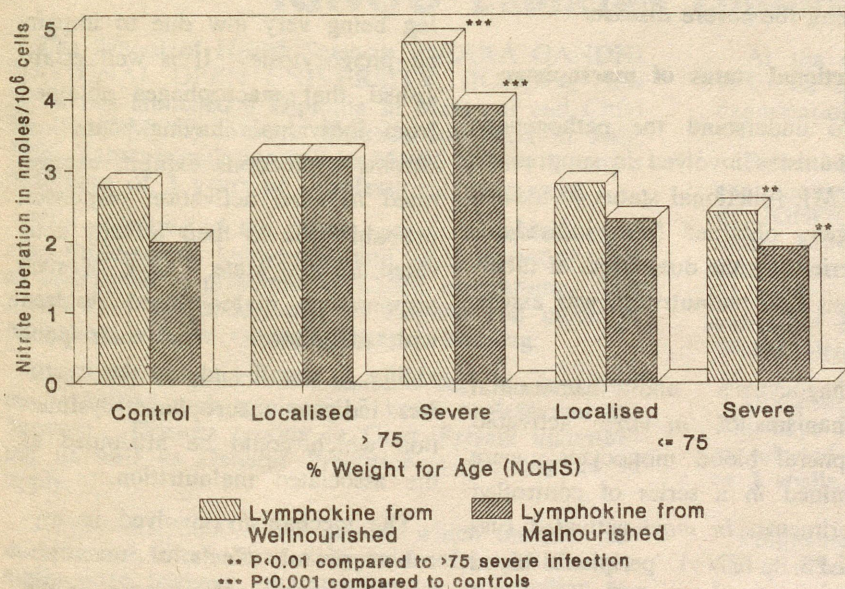


Fig. 4
 NO_2^- PRODUCTION BY MACROPHAGES ON ACTIVATION WITH LYMPHOKINE IN CHILDREN



paired cellular immunity are likely to provide a favourable milieu for the mycobacterium tuberculosis to establish and spread the disease.

NIN Studies

Since malnutrition and tuberculosis are widespread and often co-exist, particularly among large segments of economically backward Indian population, detailed studies were undertaken at the National Institute of Nutrition (NIN) to define the role of malnutrition in tuberculosis and to explore their interaction. An understanding of the pathogenetic mechanisms of the mutual interactions would help in improving the strategies aimed at prevention and control of malnutrition as well as tuberculosis. Studies conducted in children as well as adults are briefly reviewed in this article.

Clinical studies

Clinical and radiological criteria and delayed tuberculin hypersensitivity reaction were considered to diagnose childhood tuberculosis, while adults having fibrocaceous pulmonary lesions with positive sputum for AFB were investigated. Children having evidence of only lymphadenitis (cervical/mediastinal) were grouped as suffering from localised disease and children with progressive pulmonary lesions or with evidence for extrapulmonary tubercular lesions (other than cervical lymphadenitis) were classified as suffering from severe forms of the infection.

Correlation of nutritional status with the presentation of localised (lymphadenitis) or severe forms of the lesions (progressive pulmonary or extra pulmonary lesion) among

children having tuberculosis demonstrated a significant association between severe malnutrition and severe forms of tuberculosis (Fig. 1). This, however, denotes a mutually adverse interaction and does not indicate cause and effect relationship between the two conditions. Interestingly, the adverse effect of tubercular infection and disease on nutritional status could clearly be demonstrated when BMI of healthy adults who were not exposed to tuberculosis was compared with BMI of men having active pulmonary disease and contacts who had Mantoux positivity without evidence for active disease. The BMI of the latter two groups were 15.9 and 17.3 respectively and significantly lower ($P < 0.001$) than the BMI (20.3) of controls who also belonged to the same socioeconomic status as patients and contacts.

CMI in malnourished children with tuberculosis

Cell mediated immune (CMI) status was measured in children suffering from different severities of tuberculosis and having different grades of malnutrition and compared to the CMI status of healthy (uninfected) control children. Percentage of T cells and percentage of children showing satisfactory leucocyte migration inhibition (MI) in response to a mitogen (PHA) were lower in children suffering from tuberculosis compared to control children. The parameters were lowest in children showing severe forms of tuberculosis indicating the immunosuppressive effects of infection by mycobacterium tuberculosis. There was a proportionate decrease in CD_4^+ and CD_8^+ T cells in tuberculosis. When these parameters along with specific T cell responses to purified protein

derivative (PPD) among children with tuberculosis were examined in relation to nutritional status and severity, it was clear that the immunosuppression was less severe in children having localised infection. However, among children with severe forms of tuberculosis, both the qualitative and quantitative T cell responses were lowest when severe malnutrition was co-existent (Fig. 2). This study not only confirmed the association between severe malnutrition and severe forms of tuberculosis but clearly indicated the contributory role played by malnutrition *per se* in causing immunosuppression and increasing the risk of progressive/disseminated forms of tuberculosis. These observations have important functional implications. Though the role of nutritional supplements in the treatment of tuberculosis is often debated, the distinct differences observed between wellnourished and malnourished children on the disease process suggest the beneficial effects of better nutritional status of the host in preventing the severe disease.

Functional status of macrophage

To understand the pathogenetic mechanisms involved in suppression of CMI, functional status of macrophages obtained from individuals experiencing the dual stress of tuberculosis and malnutrition was assessed.

Phagocytosis and bactericidal mechanisms of *in vitro* activated peripheral blood monocytes were examined in a series of controlled experiments, *in vitro* activated (using LPS + IFN γ) peripheral blood monocytes, obtained from normal and malnourished children without tuberculosis and malnourished children with tuberculosis were challen-

ged with H_37RA strain of mycobacteria (obtained from Tuberculosis Research Centre, Madras) and viable bacterial counts were determined by labelling the bacteria with tritiated uracil. Percentage of phagocytosis and % bacterial killing of the phagocytosed organisms were determined. Phagocytosis was impaired in malnourished children compared to wellnourished children ($P < 0.05$) (Fig. 3). Macrophages obtained from 82% of the wellnourished children exhibited mycobactericidal effect with mean percentage killing of 57.0 ± 4.9 . While, only 58% of malnourished children could exhibit mycobactericidal effects of $28.6 \pm 12.2\%$. Macrophages of 87.5% of the malnourished children with tuberculosis could exhibit killing of $55.5 \pm 8.7\%$ which is comparable with that of healthy children without tuberculosis.

These results demonstrate that human macrophages have mycobactericidal effects and severe malnutrition significantly interferes with this function with the absolute killing being very low due to impaired phagocytosis. It is well established that macrophages obtained from individuals having acute or chronic infections exhibit, exaggerated *in vitro* activation responses, probably due to their already activated *in vivo* state. Lack of such responses in malnourished children with tuberculosis and their poor ability to engulf and kill the microbes indicate macrophage dysfunction which could be attributed to the associated malnutrition.

The mechanism involved in mycobactericidal effects of macrophages is a controversial issue. While some investigators incriminate reactive oxygen intermediates (ROI) as the bactericidal agents, recent

theories strongly indicate the mechanism to be operated by reactive-nitrogen intermediates (RNI).

The ability of *in vitro* activated macrophage to produce hydrogen peroxide (H_2O_2), superoxide (O_2^-) and IL-1 was examined in adults suffering from pulmonary tuberculosis and their contacts and was compared with that of healthy normal adults. The results suggested lack of macrophage activation in the malnourished patients, similar to the observations made with respect to phagocytosis and mycobacterial killing.

Recent studies identify RNI (NO , NO_2^- , NO_3^-) produced by lymphokine activated macrophages as more powerful bactericidal and tumoricidal agents. Though the ability of human macrophages to produce NO_2^- has been hitherto debated, recent studies including studies from NIN indicate that the pathway for production of NO and its metabolites from L-arginine exists in activated human macrophages.

The ability of crude lymphokine and $IFN\gamma$ activated macrophages obtained from healthy controls and malnourished patients with tu-

berculosis to produce NO_2^- was investigated and related to their nutritional status. Crude lymphokine was prepared in the laboratory by pooling the culture supernatants of *in vitro* PHA stimulated lymphocyte cultures from wellnourished (LKW) and malnourished children (LKM). Results obtained from children with tuberculosis were analysed according to the nutritional status and severity of infection and compared with healthy controls are presented in Fig. 4. Both controls and patients showed consistently lower values for NO_2^- when LKM was used for macrophage activation. The differences were, however, not statistically significant. These observations indicate that lymphokine inadequacy is probably not a major factor responsible for the macrophage dysfunction in malnourished children.

Macrophages of wellnourished children with tuberculosis produced more nitrite than the healthy control children, the increase being significantly more in children having severe infection ($P < 0.001$). Unlike the wellnourished, malnourished children failed to show any increase in nitrite production and

the values were comparable to those obtained in healthy children. Malnourished children with severe infection showed the lowest values of NO_2^- ($P < 0.01$) compared to wellnourished children with comparable severity of infection. When $IFN\gamma$ was used to activate macrophages in place of crude lymphokine, similar results were obtained. These results clearly point at the macrophage cellular dysfunction contributed by malnutrition.

Thus, malnutrition was found to impair the phagocytic function and biochemical parameters finally resulting in impaired mycobacterial killing. These observations explain the significant role played by malnutrition in contributing to the severe forms of tuberculosis and for early establishment of disease in malnourished contacts. There is potential for future research to identify the macrophage activating ability of calciferol in relation to mycobacterial killing. Such factors, if found successful could find place as nutritional adjuvants to chemotherapy in tuberculosis. ○

—Courtesy: Nutrition News, Jan. 1996.

IGNOU Launches Diploma in MCH

The School of Health Sciences, INDIRA GANDHI NATIONAL OPEN UNIVERSITY, (IGNOU), New Delhi has launched a Diploma in Maternal and Child Health (DMCH) through distance education in July, 1996. Target population will be MBBS doctors having a minimum of 3 years of professional experience.

The objective of the programme is to update students professional knowledge and skill in MCH care as underlined in principles of CSSM programme. The medium of instruction will be English and mode of education will be through distance learning.

Eligibility of prospective students for this programme is MBBS with minimum 3 years professional experience. Doctors serving in Govt./Private undertaking as well as General Practitioners are eligible to apply.

Fees—Rs. 5000/- per annum which includes admission fee, study materials, teleconference charges, audio-video package, examination fee, counselling fee etc.

Duration of the programme is one year but is extendable upto 3 years. After 3 years a re-registration has to be done.

At the end of this programme he will appear in term-end examinations—both in theory and practical examination.

Following successful completion of the term-end examinations, the students will be awarded DMCH by IGNOU which is a national university directly under Ministry of Human Resource Development. Efforts are being made by school to get the approval of MCI. The programme will be launched at the behest of Ministry of Health & Family Welfare and World Health Organisation.

Modalities—Out of 1 year programme, the students will have to undergo 3-4 weeks practical programme at selected medical colleges. This may be done in 2 or 3 spells.

Following completion of the academic programme the qualified student is expected to improve his professional knowledge in MCH care and learn the practical skills in the field of Paediatrics, O & G and health management including growth monitoring, investigation of disease outbreak etc.

— IGNO

NEW HOPE OF BLOCKING CANCER

TESTS have started on lung cancer patients with a new treatment method that blocks the growth of malignant cells.

Researchers at the UK Imperial Cancer Research Fund (ICRF) have spent 15 years developing what is described as a new approach to treating cancer. It is based on the idea of blocking the action of molecules known as neuropeptides. These are a type of hormone that dock onto cells at special points known as receptors and send signals that can lead them to multiply out of control with uncontrolled growth that characterises cancer.

Dr. Enrique Rozengurt, who led the ICRF research, explained: "What we have done is discover ways of blocking these growth factors using antagonists. These are look-alike agents that themselves dock onto the receptors, getting in the way of the growth factors. We have identified a group of antagonists that can block every type of growth factor with a particular type of signal."

ICRF says the antagonists seem to work especially well in the case of small-cell lung cancer, which

accounts for a quarter of all lung cancer cases. There is also some evidence that the treatment might also work against bowel and pancreatic cancers.

With initial trials now under way with lung cancer patients at the Western General Hospital in Edinburgh, Scotland, the aim is establish the best antagonist and safe dosages. If the treatment proves effective over the next three to five years, it will be extended to other common cancers.

Scientists admit to being excited by the development and Prof. John Smyth, director of the ICRF clinical oncology unit at Western General Hospital, says it is hoped the treatment will lead to improved survival of lung cancer. While chemotherapy is highly effective in eradicating cancer cells, the disease returns in more than 90 per cent of cases and drugs do not work a second time. The new treatment would be used as follow-up to initial chemotherapy to prevent the cancer cells regrowing.

—Medical News from Britain

IS HEART DISEASE "PROGRAMMED" BEFORE BIRTH ?

NEW research has shown that people who were small at birth are more likely to develop heart disease and high blood pressure in adult life.

The UK Medical Research Council's (MRC) epidemiology unit based at Southampton University in southern England says these findings of its research has led to the hypothesis that heart disease is "programmed" by undernutrition and poor growth before birth.

But little is known about the effects of growth during childhood on the risk of heart disease in later adult life and this has led to collaboration between Southampton University and the National Public Health Institute in Helsinki.

The Anglo-Finnish link-up follows a fruitless search in Britain for records of people whose growth and development had been recorded both at birth and throughout childhood. Such a collection of detailed records has recently been discovered in Finland and

these will now be used for a five year joint investigation.

The Finnish records contain not only measurements of children's size at birth but also information on their height, weight, illnesses and living conditions, which was collected at child health centres and schools.

Dr. Clive Osmond and Prof. David Barker from Southampton and Dr. Johan Eriksson in Helsinki have been given over £400,000 financial backing by the British Heart Foundation to study the records of 14,500 men and women born in Helsinki between 1925 and 1939 to see how patterns of growth during infancy, childhood and puberty have modified the risk of developing heart disease in adult life.

A Southampton University spokesman commented: "Finland has some of the highest rates of heart disease in the world so it will provide an important setting for this new investigation into the early origins of cardiovascular disease."

Medical News from Britain

CHILDREN AND THE IMPACT OF THE HIV/AIDS EPIDEMIC

About 830,000 children are living with HIV/AIDS.

However, the impact of the HIV epidemic on children goes far beyond the large number of children already infected with the virus.

A study in the Dominican Republic, Kenya, Rwanda, Thailand, Uganda, the USA and Zambia, carried out by the Orphan Project (New York), estimated the number of children under 14 years old already orphaned by AIDS to total more than 1 million in these seven countries. That number may rise to almost 2 million by the year 2000. Kenyan, Rwandan, Ugandan and Zambian orphans account for 95% of these 1 million children.

Appalling as these figures are, they reflect only part of a far larger social tragedy. As UNICEF has pointed out, children whose mothers or both parents have HIV/AIDS begin to have problems long before their parents' death.

Using a new analytical approach, the Global Orphan Project (Boston & Brasilia) estimated the total number of Brazilian children with HIV-infected mothers and hence directly affected by the epidemic. These include all those who are already orphans as well as all those at risk of being orphaned and displaced.

It was estimated that out of a total of 183,000 such children, 6% (10,600) have already lost their mothers to AIDS. However, the majority (172,400) are children whose mothers are living with HIV/AIDS and who face the prospect of being orphaned at some point in the future. In many cases, the mothers are unaware that they are HIV-positive and hence make no advance plans for guardianship of their children when they become ill or die. In other cases, the mothers are already suffering from AIDS-related illness and do not have the necessary physical strength or family and financial support to take care of their children.

Approximately 8% of children at risk of being orphaned and displaced by AIDS are themselves HIV-positive.

Extrapolating these findings from Brazil to other countries may be difficult because of differences in fertility rates and HIV infection rates among women. However, the results establish clearly that, for any country, the number of children affected at any one time by the epidemic is far greater than the number of infected children or already orphaned children.

If, for example, we make the conservative guess that already orphaned children represent 10% of the total number of children with HIV-infected mothers in Uganda, this means that more than 3 million children are already feeling the direct impact of the epidemic in this country alone.

— UNAIDS/WHO

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