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**NEW, EMERGING AND RE-EMERGING
INFECTIOUS DISEASES:
PREVENTION AND CONTROL**

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NEW, EMERGING AND RE-EMERGING INFECTIOUS DISEASES: PREVENTION AND CONTROL

1. INTRODUCTION

The global eradication of smallpox in 1977 and the discovery of antibiotics and vaccines led to optimism and a sense of complacency that infectious diseases, as public health problems, could be eradicated or eliminated. This complacency has had fatal consequences and, at present, infectious diseases are the leading cause of death, worldwide. Today, at least 17 million people die annually from infectious diseases. The South-East Asia Region (SEAR) unfortunately accounts for almost 41% (7 million) of these tragic deaths (Annex 1). Even so, this figure is an underestimation since some noncommunicable diseases too, such as certain types of cancer and malnutrition, can be contracted as a result of an infection.

Today, in SEAR countries, the spectrum of infectious diseases is changing rapidly in conjunction with dramatic socioeconomic and ecological changes. While the age-old diseases, such as cholera and tuberculosis, continue to dominate the disease pattern in the Region, others like malaria, plague and kala-azar, which were on the verge of eradication, have reappeared. New diseases, such as a new strain of cholera (cholera O139) and HIV infection, are being reported in the Region. In addition, diseases which were once of no public health concern, such as melioidosis, are assuming importance in association with HIV in some countries. These diseases also exact a staggeringly high economic price from individuals, families and communities in terms of health care and loss of productivity. In keeping with these trends, WHO has formulated a strategy to strengthen national and international capacities in the surveillance and control of communicable diseases which represent new, emerging and re-emerging public health problems, including the problem of antibiotic resistance.

There have been notable successes in the never ceasing battle against infectious diseases. Significant progress has been made in the Region towards achieving the goals of eradication of poliomyelitis and guineaworm disease, and the elimination of neonatal tetanus and leprosy as public health problems by the year 2000. A significant reduction in morbidity and mortality associated with other vaccine-preventable diseases like measles, diphtheria and whooping cough has also been achieved. Yet, new, emerging and re-emerging infectious diseases pose serious health problems in almost all the countries of the Region.

2. NEW, EMERGING AND RE-EMERGING INFECTIOUS DISEASES

2.1 Definition

Emerging infectious diseases are those the incidence of which in humans has either increased during the last two decades or threatens to increase in the near future. The term includes **newly**-appearing infectious diseases or those spreading to new geographical areas. It also refers to those diseases which were previously easily controlled by antibiotics but have now developed resistance to these drugs. Example of these diseases are tuberculosis, malaria, DHF, meningococcal meningitis, Japanese encephalitis and other encephalitides.

Re-emerging infectious diseases are those that have reappeared after a significant decline in their incidence. Examples are plague, kala-azar and diphtheria.

The status of these diseases, which are major causes of mortality and morbidity in the Region, is reviewed briefly in Annex 2. A comparison of the estimated global disease burden with that in the South-East Asia Region is given in Annex 3.

2.2 Why are these diseases emerging?

There is no single factor responsible for the emergence of these diseases; rather, the emergence is multifactorial in origin. Poverty is on the increase and millions of people are bound by their impoverished living conditions to the daily hazard of infectious diseases. Environmental degradation is another factor that contributes to the increasing disease burden.

Rapid population growth combined with uncontrolled urbanization means that millions of city dwellers are forced to live in overcrowded and unhygienic conditions lacking clean water and adequate sanitation. These conditions provide ample breeding grounds for infectious diseases.

Migration and displacement of people due to wars, civil strife, and natural disasters like floods and earthquakes, also provide fertile breeding grounds for these diseases.

The rapid increase in international travel and growing trade and tourism also enhance the potential of the spread of infectious diseases from one country to another.

Mutation results in new strains of infectious agents and of drug resistance. This together with the development of vector-resistance to insecticides (for example, malaria mosquito becoming resistant to DDT) are also important factors in the emergence of new diseases.

One of the most important factors contributing to the spread of emerging infectious diseases is the low priority and support given to public health services in many countries.

2.3 Economic impact of new, emerging and re-emerging diseases

The economic impact of these diseases can be enormous. For example;

- ◆ During the plague outbreak in 1994, India is estimated to have suffered losses in trade, employment and tourism amounting to over US\$ 1.5 billion.
- ◆ Similarly, as a result of the cholera epidemic in 1991, Peru lost an estimated US\$ 770 million.
- ◆ More recently, the "mad-cow disease" in UK has resulted in a loss of billions of pounds sterling following the ban imposed by the European Community on the import of British beef.

3. PRIORITY AREAS FOR ACTION

3.1 *Strengthening National Capabilities*

There is no doubt that countries will continue to face outbreaks due to emerging infectious diseases. The only way to combat this threat is to recognize these diseases early and take preventive and control measures rapidly. Thus, countries should develop an early warning system and a rapid response mechanism, if they are to protect their citizens from the unnecessary suffering and staggering economic losses that such outbreaks cause. To achieve this, epidemiological and laboratory services in most countries need to be strengthened. In fact, the World Health Assembly held in May 1995, through its resolution on communicable diseases prevention and control (WHA 48.13), urged the member countries to strengthen their national and local programmes of active surveillance for infectious diseases. The district health systems in the countries should be strengthened. Early action for the prevention and control of infectious diseases, before they assume epidemic proportions, must be taken at the district level.

Expenditure on prevention and control of infectious diseases and on some other health-related aspects of human development is sometimes perceived as a drain on national or community resources. On the contrary, it is a real investment in a nation's human capital, enhancing people's ability to contribute actively to the overall economic and social development, and to enjoy a satisfactory quality of life.

Additional resources are needed for preventive activities as well as to create the necessary public awareness. It is here that the private sector can play an important role.

3.2 *Intersectoral Collaboration*

Effective control of these new, emerging and re-emerging infectious diseases calls for close collaboration between the health ministries and other ministries like agriculture, education and urban development. A classic example of poor intersectoral collaboration is when irrigation facilities are promoted without any consideration of the health implications. This gives rise to mosquitogenic conditions leading to outbreaks of malaria - a distinct epidemiological situation referred to as "irrigation malaria". The health implications of projects implemented by other ministries call for a constant dialogue between the concerned ministry and the health ministry, from the planning stage onwards. Well-planned intersectoral collaboration will not only further health objectives but also accelerate the process of development. Emphasis should be on healthy public policies.

3.3 *Intercountry Collaboration*

Disease causing microbes are no respecters of international boundaries. With the ever increasing speed and volume of international travel and trade every opportunity exists for the rapid spread of infectious agents among countries. Because of trade and travel restrictions imposed on countries reporting infectious diseases, some countries are reluctant to provide information on disease occurrence in their countries. In fact, imposition of restrictions on affected countries is not the solution to the prevention and control of the spread of disease. On the contrary, the rapid flow of disease surveillance and other relevant data among countries is the only way countries can be prepared to control the spread of disease.

3.4 Role of WHO

WHO plays a key role in keeping countries informed and also in providing the necessary technical and logistical assistance to control the spread of these diseases, provided disease surveillance information is reported by Member Countries. This was clearly demonstrated in the recent outbreaks of plague (in India), and of Ebola haemorrhagic fever and yellow fever (in Africa). For WHO to be able to respond rapidly, it is important that surveillance data is reported quickly to WHO by Member Countries.

In order to assist neighbouring countries in coordinating their activities towards the prevention and control of the spread of disease, the WHO Regional Office for South-East Asia has conducted several border meetings among countries sharing common borders not only in this Region but also among countries in the Western Pacific Region - Laos, Cambodia, and China. These meetings have resulted in the development of strategies for prevention and control of the spread of diseases like malaria, kala-azar, HIV/AIDS as also of the EPI diseases like poliomyelitis and diphtheria, across country borders.

Also in the light of new, emerging and re-emerging diseases, there is an urgent need to revise the International Health Regulations, a task which WHO has already begun. The revised International Health Regulations will facilitate the free flow of information on disease occurrence without the affected countries having to fear the imposition of totally unjustified restrictions on travel and trade.

4. CONCLUSION

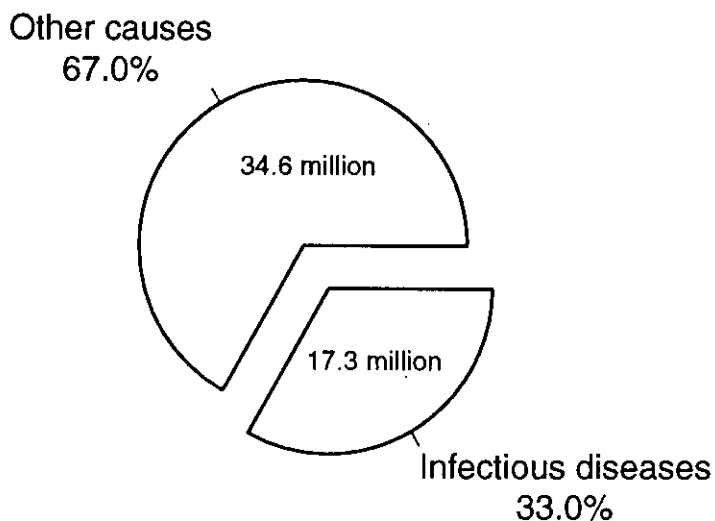
The existing and new infectious diseases will continue to dominate the disease scenario in the countries of the Region. The only defence against such catastrophes is early detection and initiation of rapid response so as to control these diseases before they assume epidemic proportions.

This emphasizes the importance for countries to develop their epidemiological services with particular reference to having a sensitive surveillance system and a rapid response mechanism. Both intersectoral and intercountry collaborations have to be strengthened. The WHO Regional Office for South-East Asia conducted interregional as well as intercountry meetings so as to alert the countries to the threat of new, emerging and re-emerging infectious diseases as also to assist the countries in developing definite plans of combating this threat. In order to prevent and control the spread of disease across national borders, there should be a network for rapid and free flow of information among countries. And in order to reach targets and maintain high standards, it would be necessary to mobilize more resources from national budgets and donor agencies. Various mass media and communication channels should be used for advocacy and health promotion activities. The involvement of NGOs should be further strengthened, particularly in remote areas and in urban slums, for the promotion and protection of health.

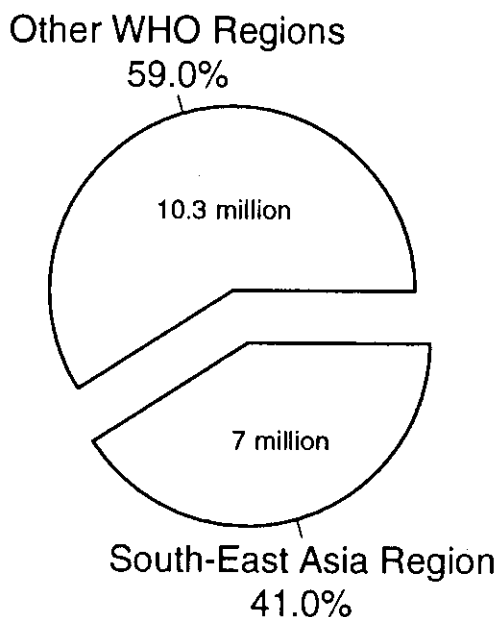
A nation can only be as strong as its people. The decision-makers have a unique opportunity to ensure the highest possible level of health for the citizens and thus help make this fundamental right a reality.

ESTIMATED DEATHS DUE TO INFECTIOUS DISEASES AS PERCENTAGE OF TOTAL DEATHS - 1995

Total Global Deaths - 51.9 million



ESTIMATED DEATHS DUE TO INFECTIOUS DISEASES IN WHO REGIONS - 1995



STATUS OF NEW, EMERGING AND RE-EMERGING INFECTIOUS DISEASES IN THE WHO SOUTH-EAST ASIA REGION

New Diseases

- (a) HIV/AIDS Over 25 000 cases of AIDS reported as of June 1996. Estimated that almost 3 million persons are infected in the Region.
- (b) Cholera 0139 First appeared in South India in 1992. Caused large outbreaks in India and Bangladesh. Cases also reported from Myanmar, Nepal, Sri Lanka and Thailand. In 1995 and 1996, EL Tor strain has largely replaced the 0139 strain.

Emerging Diseases

- (a) Tuberculosis Biggest (infectious disease) killer of adults. Estimated that in 1995 there were 3.5 million new cases in the Region (40% of global burden). HIV infection and drug resistance have added new dimensions to the epidemiology of this disease.
- (b) Malaria Estimated that 1.2 billion people live in malarious areas and 23.6 million new cases and 40 000 deaths occurred in the Region in 1995. An alarming feature is the increasing number of drug resistant *falciparum* (responsible for cerebral malaria) cases of malaria. Increasing resistance of the mosquito vectors to insecticides is another serious problem.
- (c) Dengue/DHF A leading cause of hospitalization and death among children in many countries in the Region. It is estimated that 400 000 cases and 8 000 deaths occurred in 1995 in the Region.
- (d) Japanese Encephalitis An emerging problem, particularly in India, Nepal, Sri Lanka and Thailand. Estimated that 20 000 cases and 4 000 deaths occurred in the Region in 1995. A successful immunization strategy is employed in India, Sri Lanka and Thailand.
- (e) Meningococcal Meningitis Reported from most of the countries in the Region. Estimated that 21 000 cases and 5 000 deaths occurred in 1995.

- (f) Hepatitis B A main cause of liver cancer and cirrhosis. Estimated that there are more than 80 million carriers. Hepatitis mothers can pass the disease on to the newborn. Hepatitis B vaccine has been introduced into EPI in Bhutan, Maldives, Thailand, and several districts of Indonesia.
- (g) Hepatitis C Preliminary screening of general population shows that Hepatitis C is also common in the WHO South-East Asia Region. Close association of this virus with hepatocellular carcinoma has been demonstrated in India, Indonesia, Myanmar and Thailand.
- (H) Hepatitis E Hepatitis E is a cause of many waterborne outbreaks in many countries in the WHO South-East Asia Region. High mortality has been observed in pregnant women.

Re-emerging Diseases

- (a) Plague Suddenly re-appeared in India in 1994 after a period of 27 years. Natural foci of plague exist in India, Indonesia, Myanmar and possibly, Nepal.
- (b) Kala-azar Almost disappeared from this Region in the early 1960s. Has reappeared and is a serious problem in the rural areas of India, Bangladesh and Nepal. It is estimated that 100 000 cases and 5 000 deaths occurred in the Region in 1995.

**COMPARISON OF ESTIMATED DISEASE BURDEN IN THE
SOUTH-EAST ASIA REGION WITH GLOBAL ESTIMATES**

Disease	Worldwide No. of cases (Estimated)	SEA Region No. of cases (Estimated)	SEAR disease burden as proportion of global estimates (%)
Malaria			
- Total	305 million	24 million	8
- Drug Resistant	20 million	6 million	30
Tuberculosis - Reported	3.9 million	1.9 million	49
Estimated	8.2 million	4.2 million	51
Meningococcal meningitis (deaths)	35 000	5 000	14
Dengue/DHF	700 000	400 000	57
Japanese Encephalitis	45 000	21 000	47
Visceral Leishmaniasis	500 000	300 000	60
Hepatitis B Carriers	350 million	80 million	23
Hepatitis E	6 million	4 million	67