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Cancer Control in the Eastern Mediterranean Region

WORLD HEALTH ORGANIZATION
Regional Office for the Eastern Mediterranean

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Contents

Abbreviations

AIDS	Acquired immunodeficiency syndrome
BSE	Breast self-examination
CNS	Central nervous system
EMR	Eastern Mediterranean Region
EPI	Expanded Programme on Immunization
FAO	Food and Agriculture Organization of the United Nations
GIT	Gastrointestinal tract
HCR	Hospital-based cancer registry
HBsAg	Hepatitis B surface antigen
HBV	Hepatitis B virus
IARC	International Agency for Research on Cancer
ICD-10	International Classification of Diseases, 10th revision
KAP	Knowledge, attitudes and practices
MCH	Maternal and child health
MRD	Medical records department
NCCP	National Cancer Control Programme
PCR	Population-based cancer registry
PHC	Primary health care
UNRWA	United Nations Relief and Works Agency for Palestine Refugees in the Near East

Preface

Cancer is being increasingly recognized as an existing and growing health concern in countries of the Eastern Mediterranean Region. This publication brings together the data reported to the WHO Eastern Mediterranean Regional Office on cancer in countries of the Region. It also reviews strategies for the prevention, early detection, management and palliative care of cancer and provides guidelines for cancer control and the establishment of National Cancer Control Programmes (NCCPs). These Programmes focus on priorities of the EMR and take into consideration the available facilities and regional circumstances.

A part of this document is supported by WHO publications: *National Cancer Control Programmes: Policies and Managerial Guidelines,* WHO, Geneva, 1992, and *Cancer Pain Relief and Palliative Care,* Technical Report Series 804, WHO, Geneva, 1990. The recommendations made in the publication, as well as the priorities and approaches proposed, are based on the outcome of a WHO Intercountry Meeting on National Cancer Control Programmes, which was held in Cairo, Egypt in November, 1993. A list of the participants in this meeting is included as Annex 1.

We are grateful for the contributions made by Drs. J. Stjernsward, A. Miller and R. Sankaranarayanan in the preparation of this publication and the useful comments they made on the final draft.

It is hoped that this publication will provoke national initiatives and intensify efforts in the fight against cancer in this Region. The WHO Regional Office for the Eastern Mediterranean will continue to provide support to those seeking to control cancer in their communities.

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Introduction

Cancer is now emerging as a major public health problem throughout the world. Each year it is estimated to affect at least 9 million people and kill 5 million. At present, it accounts for about one-tenth of all deaths worldwide. New lifestyles, the increase in the consumption of tobacco and ageing of populations are contributing to the increasing magnitude of cancer.

Contrary to the widely held belief that cancer is primarily a disease of industrialized nations, the burden of cancer is also increasing in developing countries. Several cancers, including those of the stomach, oral cavity, liver and uterine cervix, are now known to be more prevalent in developing and poor communities. Moreover, the global burden of cancer is heaviest in developing countries where almost 60% of cancer deaths are estimated to occur. Projections on the future burden of cancer also suggest that nearly two-thirds of cancers occurring in the next 25 years will be in developing countries.

Although reliable data on cancer in the Eastern Mediterranean Region (EMR) are scarce, available evidence suggests that the problem is attaining considerable proportions in many Member States and cancer is now reported as one of the leading causes of death.

The achievements made in the control of communicable diseases and the greater longevity enjoyed by populations in the EMR are important factors contributing to the increasing morbidity and mortality due to cancer in the Region. The rapid spread of smoking, newly acquired dietary practices and prevailing environmental conditions are other causes of the growing significance of cancer. Certain communicable diseases prevalent in the EMR, such as hepatitis B and schistosomiasis, which are associated with increased occurrence of primary hepatocellular carcinoma and bladder neoplasia, are also conducive to high morbidity and mortality due to cancer in some countries in the Region.

Prevention of cancer is possible and early detection with the aim of potential cure is feasible for many cancers. It is estimated that over one-third of cancers are preventable; one-third are potentially curable provided they are detected early in their course; and for the majority of incurable cases, the quality of life can be improved by palliative care.

Despite the general increase in awareness of the importance of cancer control, the problem has not yet received the priority that it rightly deserves among other public health problems. No comprehensive national cancer control programme has yet been established in Member States despite the improvements in tertiary care noted in many countries.

Recognizing the need to promote cancer control activities in the Region and realizing that the time has come for countries to initiate comprehensive programmes for cancer

prevention and control, the WHO Regional Office for the Eastern Mediterranean organized in November 1993 an intercountry meeting on National Cancer Control Programmes in Cairo, Egypt. This meeting was attended by focal points or national coordinators for cancer control in 15 countries of the Region.

The main objectives of the meeting were to stimulate Member States to establish comprehensive National Cancer Control Programmes and to assist them in formulating national plans.

Following this meeting, specific WHO collaborative activities on cancer control have been planned in most countries of the Region.

Global situation

Most frequent cancers

Table 1 shows the most frequent cancers worldwide in both sexes, around 1985, in terms of estimated numbers and percentages of the total. The lung is the most frequent cancer site among men, followed by cancers of the stomach, colon/rectum, prostate and mouth/pharynx.

TABLE 1. **Sites of the most frequent cancers worldwide (circa 1985)**

Males			Females		
Site	**Number of cases**	**%**	**Site**	**Number of cases**	**%**
Lung	667 000	17.6	Breast	719 000	19.1
Stomach	473 000	12.3	Cervix	437 000	11.6
Colon/rectum	331 000	8.6	Colon/rectum	346 000	9.2
Prostate	291 000	7.6	Stomach	282 000	7.5
Mouth/pharynx	270 000	7.0	Lung	219 000	5.8
Liver	214 000	5.6	Ovary	162 000	4.3
Oesophagus	196 000	5.1	Mouth/pharynx	143 000	3.8
Bladder	182 000	4.7	Corpus uteri	140 000	3.7
Lymphoma	181 000	4.7	Lymphoma	135 000	3.6
Leukaemia	121 000	3.1	Oesophagus	108 000	2.9

Source: Parkin, D.M., Pisani, P., Ferlay, J. Estimates of the Worldwide incidence of eighteen major cancers in 1985. *Int.J. Cancer* 1993; 54: 594-606.

The breast is the leading cancer site in women, followed by cancers of the uterine cervix, colon/rectum, stomach and lung.

Overall, the lung is the leading cancer site (11.8%), followed by the stomach (9.9%), breast (9.4%), colon/rectum (8.9%), uterine cervix (5.7%), mouth/pharynx (5.4%), lymphoma (4.2%) and liver (4.1%). The previous estimates, around 1980, placed stomach cancer in first place which is now occupied by lung cancer.

Tables 2 and 3 show the most frequent cancers in both sexes in the developed and developing countries. Cancers of the stomach, lung, mouth/pharynx, liver and oesophagus are the leading ones in males in developing countries. Cancer of the uterine cervix is the most common malignancy among women in developing countries, accounting for more than three-fourths of cervical cancer in the world. This is followed by cancer of the breast, stomach and mouth/pharynx.

In the developed world, lung cancer predominates among males, followed by colon/rectum, prostate, stomach and bladder. Among women, breast cancer is the leading one, followed by colon/rectum, stomach, lung and cervix uteri.

TABLE 2. **Most frequent cancers in males in developed and developing countries**

Developing countries		Developed countries	
Site	**Number of cases**	**Site**	**Number of cases**
Stomach	280 000	Lung	415 000
Lung	261 000	Colon/rectum	225 000
Mouth/pharynx	187 000	Prostate	218 000
Liver	168 000	Stomach	193 000
Oesophagus	153 000	Bladder	110 000

TABLE 3. **Most frequent cancers in females in developed and developing countries**

Developing countries		Developed countries	
Site	**Number of cases**	**Site**	**Number of cases**
Cervix	344 000	Breast	422 000
Breast	298 000	Colon/rectum	240 000
Stomach	148 000	Stomach	134 000
Mouth/pharynx	114 000	Lung	127 000
Colon/rectum	106 000	Cervix uteri	94 000

Source: Parkin, D.M., Pisani, P., Ferlay, J. Estimates of the worldwide incidence of eighteen major cancers in 1985. *Int.J. Cancer* 1993; 54: 594-606.

LUNG CANCER

Lung cancer accounts for 11.8% of all cancers in the world. The majority of cases occur in developed countries. Age-standardized rates range from 2.5 per 100 000 in western Africa to 73.6 per 100 000 in North America. It is the predominant cancer among males in Europe, North America, the Caribbean, temperate South America, Australia, western and south-east Asia, and Polynesia.

STOMACH CANCER

This accounts for about 10% of all cancers, being equally common in developed and developing countries. Mortality rates are particularly high in Chile, Hungary, Japan and Poland.

BREAST CANCER

Breast cancer accounts for one-fifth of all cancers in women. It is most common among women in developed countries (except Japan), northern Africa, the Caribbean, South America, western Asia and Polynesia.

COLORECTAL CANCER

Colorectal cancer is the second most common malignancy in both sexes in developed countries. Rates in Africa, excluding South Africa, are low.

CERVIX CANCER

Cervical cancer is the second most common cancer in women worldwide. More than one-quarter of all cases occur in south Asia. It is the most common cancer among women in most developing areas, except parts of northern Africa, the Caribbean, South America, Polynesia, China and eastern Asia.

ORAL CANCER

Cancers of the oral cavity and pharynx are a diverse group of neoplasms. One-third of these neoplasms occur in south Asia.

LIVER CANCER

Three-fourths of cases occur in developing countries. The areas of highest incidence are sub-Saharan Africa and eastern and south-eastern Asia. It is most common in countries with high rates of hepatitis B virus (HBV) infection; the vast majority of cases have serological evidence of HBV infection.

LYMPHOMAS

Crude incidence rates indicate Europe, North America, Australia and New Zealand as high incidence areas.

OESOPHAGEAL CANCER

Among men, eastern and southern Africa, China and South America are high incidence areas; among women, high incidence is found in southern Africa, China and southern Asia.

PROSTATE CANCER

Incidence rates are highest in regions where there are large numbers of elderly persons, and thus high crude incidence rates are found in North America, northern and western Europe, Australia and New Zealand. Incidence rates in Asia are low.

BLADDER CANCER

There are high incidence rates in developed countries (except Japan), northern Africa and western Asia. It is one of the leading types of cancer in Egypt and Iraq.

Variations in cancer patterns

Within regions and countries there are considerable variations in types of cancers. Apart from age distribution, these differences are related mostly to environmental and lifestyle factors. Studies on migrant populations have clearly documented the role of environmental and lifestyle influences in cancer causation.

TABLE 4. **Cancer mortality in males in developing and developed countries (circa 1985)**

Developing countries		Developed countries	
Site	**Number of cases**	**Site**	**Number of cases**
Stomach	237 000	Lung	366 000
Lung	234 100	Stomach	147 200
Liver	167 300	Colon/Rectum	120 200
Oesophagus	146 000	Prostate	92 100
Mouth/pharynx	131 600	Pancreas	52 900

TABLE 5. **Cancer mortality in females in developing and developed countries (circa 1985)**

Developing countries		Developed countries	
Site	**Number of cases**	**Site**	**Number of cases**
Cervix	159 300	Breast	161 000
Breast	147 100	Colon/Rectum	132 500
Stomach	127 800	Stomach	108 000
Mouth/pharynx	85 600	Lung	104 300
Oesophagus	84 900	Ovary	53 500

Source: Pisani, P., Parkin, D.M., Ferlay, J. Estimates of the worldwide mortality from eighteen major cancers in 1985. Implications for prevention and projections of future burden. *Int. J. Cancer* 1993; 55: 891-903.

Regional situation

During the last two decades, significant demographic changes have taken place in the Eastern Mediterranean Region. The total population of the Region has almost doubled. The progressive decline in the crude death rate, and infant and under-5 mortalities has led to increased survival. Life expectancy has increased to an average of 62 years in 1990, although in some countries life expectancy is considerably higher.

Urbanization is also increasing. The proportion of the urban population has gone up from 39% in 1985 to 44% in 1990. In some countries, up to 95% of the population lives in urban areas.

Available data generally indicate high rates of smoking in populations of the EMR, especially among men. Tobacco consumption rates have risen considerably over the last two decades. Imports and the production of cigarettes are progressively increasing.

The significant transition to economic affluence has also been associated with changes in eating practices and nutritional status that promote the development of noncommunicable diseases, including cancer. In many countries, consumption of fat and refined carbohydrates has increased and the availability and consumption of calories has risen beyond requirements.

Despite the paucity of morbidity and mortality data in most EMR countries, there is enough evidence to indicate that cancer is now becoming a problem of major public health concern. Published reports on the magnitude of the cancer problem are scarce and population-based cancer registries are established in only a few countries. However, hospital-based frequencies are available from the major cancer treatment centres in almost all countries in the Region. Though biased, they provide some insight into the cancer patterns prevailing in the Region. Mortality statistics reported by countries indicate that cancer is emerging as one of the leading causes of death, occupying third place in some Member States.

Based on estimates made by the International Agency for Research on Cancer (IARC), approximately 361 800 new cancer cases occurred in the EMR circa 1985. They account for 4.7% of total cancers in the world and their share of global cancer mortality is around 4.8%. Generally, the common cancers among males include lung, lymphoma, bladder, stomach and mouth/pharynx. Among females, breast, urinary bladder, lymphoma and cervix are common cancers sites. However, regional variations exist, as can be observed from the country profiles; for example, high frequencies of nasopharyngeal carcinoma in males and uterine cervical cancer in females are reported from Morocco and Sudan. For data on cancer patterns in the Eastern Mediterranean Region see pages 27 to 31.

Controlling cancer: the role and components of National Cancer Control Programmes

The concept of the National Cancer Control Programme (NCCP) is a rational approach to implementing existing knowledge and incorporating scientific advances into practice. Even with limited resources, a significant impact can be achieved if the right priorities and strategies are established and implemented. Without a NCCP, most resources provided to cancer therapy will be in tertiary care facilities which often serve selected populations and tend to have a very limited impact.

A NCCP is an integrated set of activities covering primary prevention, early detection, treatment and palliative care. Such a plan of action should be approved by the Minister of Health. Political commitment is essential.

REQUIREMENTS FOR ESTABLISHING A NCCP

- **assess the magnitude and characteristics of the cancer problem;**
- **identify general objectives and set measurable cancer control targets. The broad objectives of the national programme should cover (depending on available resources and local circumstances):**
  - **the prevention of cancer**
  - **early diagnosis coupled with effective treatment for potentially curable cancers**
  - **relief of pain, and use of measures to improve the quality of life of patients with incurable disease**
- **select priority strategies for initial cancer control activities; and**
- **evaluate strategies and progress made.**

As these policies evolve, it is essential to cultivate political commitment for their adoption and implementation. Health professionals responsible for cancer control must educate political leaders and members of the health professions as well as the community concerning the cancer situation in their countries and the considerable potential for its control.

Countries may vary in the objectives they establish and the priorities they set, in accordance with the cancer burden and the resources available to them.

Although more than half of the world's cancer patients live in developing countries, less than 10% of the total resources committed to cancer control are available to them.

I. Prevention of cancer

Cancer control at the national level should include a set of integrated activities ranging from prevention, through early detection and screening, to treatment and palliative care. All these approaches may be used for all types of cancer encountered locally. However, depending on the state of scientific knowledge about individual cancer sites, the scarce resources available and the anticipated impact of the various elements of cancer control, different aspects may take priority. Primary prevention is a priority for lung cancer, screening and early detection are priorities for cancer of the cervix, whereas for Hodgkin's disease, testicular tumours and childhood cancers, treatment is the priority. For many cancers such as oral and breast cancers for example, more than one approach must be used.

Primary prevention comprises either removal or neutralization of harmful exposure and taking measures to reduce the susceptibility of individuals to such exposures.

The various actions available for cancer prevention include:

- **lifestyle modification;**
- **legislation to reduce or prevent exposure to carcinogens; and**
- **various forms of active intervention.**

Cancer prevention should form the basis of all NCCPs. General education is possible on tobacco control, diet, alcohol consumption, occupational factors and the environment, hepatitis B vaccination, schistosomiasis related to bladder cancer, the dangers of sun exposure and sexual and reproductive factors. Priorities will vary according to the cancer burden, types of commonly encountered cancers and local circumstances.

The greatest gains are currently to be made from lifestyle modification. Special emphasis should be placed on educating children. Information on risk factors should be incorporated into the school curriculum. Since these risk factors are generally shared with other noncommunicable diseases, intervention in childhood and adolescence is also effective in the prevention of adult cardiovascular disease and may also play a role in reducing the occurrence of non-insulin dependent diabetes.

Epidemiology has provided much insight into the importance of tobacco control, especially the dominant effect of duration of smoking on its subsequent effects. This explains why effects of smoking in a given country's statistics are delayed, and why current smoking rates reflect the future cancer burden, rather than the burden of today.

Initial evidence that diet is important in cancer aetiology came from descriptive epidemiology and animal studies. Association has been found between fat intake and breast cancer, and a stronger association was observed between saturated fat intake and colorectal cancer. Other diet/cancer associations are cholesterol and pancreatic cancer, bladder and lung cancer, and nitrite and stomach cancer.

In general, the available knowledge on diet and cancer presently implicates high fat content, perhaps particularly saturated fat, as a factor that contributes to the causation of cancer, but some constituents in fruits and vegetables appear to be protective. This is true not only for breast and colorectal cancer, but for a large number of other cancers as well, including those of the mouth, oesophagus, stomach, pancreas, lung and bladder, thus making attention to diet an important objective in cancer control. It is important, for the control of cardiovascular disease as well as cancer, that developing countries take positive steps to avoid the negative patterns of a modern diet.

Control of certain infections commonly encountered in some developing countries, such as hepatitis B and schistosomiasis as well as AIDS, can play an important role in cancer prevention.

Other possible approaches to cancer prevention tend to be more applicable to developed countries, including reducing exposure to sunlight and other forms of radiation. However, although it is not clear how much cancer is attributable to environmental contamination with carcinogens in developed countries, there is some indication that such exposures may be worse in some developing countries. This area needs to be investigated by national cancer control programmes and appropriate measures should be taken where indicated.

TOBACCO AND CANCER

Lung cancer now accounts for more than 6% of all deaths in several developed countries. This phenomenon is extending to the countries in the Eastern Mediterranean where tobacco use is rapidly increasing. Cigarette smoking in the Region has more than doubled during the past 10 years and tobacco consumption is reported to have increased more rapidly than in most other regions.

A substantial proportion of cancer in the oral cavity, pharynx, larynx, pancreas, kidney, oesophagus and bladder is also attributable to tobacco. Moreover, smoking is responsible for a large number of chronic lung diseases and contributes heavily to the development of

cardiovascular diseases. The organs in which cancer develops depend upon the sites in contact with the chemical constituents of tobacco and its smoke, many of which are known carcinogens. Thus, when tobacco smoke is inhaled, the lungs are the principal target. When tobacco is kept unsmoked in the mouth, the cheek, the tongue and other parts of the oral cavity are affected. For other sites that show increased risk, it seems probable that carcinogens are absorbed into the blood stream from the lungs and transported to the relevant organ.

One critical aspect of tobacco relevant to cancer control is the effect of passive exposure to tobacco smoke in increasing the risk of lung cancer and possibly other cancers in non-smokers. Smokers who report that they do not inhale run a risk four to eight times greater than that of non-smokers. The duration of smoking appears to be more important than the daily dose in determining lung cancer risk.

Control of tobacco poses one of the greatest challenges to public health, especially in the developing countries.

Approaches for smoking prevention programmes include:

- **education;**
- **legislation, including prohibiting advertising; and**
- **taxation.**

The education of people to resist starting the use of tobacco, or to stop, is a basic step toward dealing with the problem. However, imparting knowledge to people is not sufficient; it is necessary to cultivate attitudes that will be effective against smoking or other uses of tobacco. Psychosocial skills to resist the social pressures that encourage tobacco use are essential in situations where people are either heavily exposed to pressures to initiate tobacco use, or to continue. Teaching social resistance skills to youngsters of 10-15 years of age in school can help them avoid cigarette smoking.

Mass education and development of public attitudes against tobacco appear to encourage many cigarette smokers to relinquish the habit. Mass attitudes thus seem to be highly influential in regard to cigarette smoking. People with higher levels of education and concern about health, especially physicians and other professionals, tend to be the first to stop.

Cessation can be promoted by governmental action to restrict smoking on public passenger vehicles, in restaurants, public buildings and workplaces, by controlling the advertising of tobacco products, and by using the media to educate people about the dangers of smoking and how to avoid or overcome addiction.

Health services, particularly physicians' advice and specific counselling, can substantially enhance the trend away from smoking. Professional health workers are also influenced by their personal attitudes as well as by the policies of the health services in which they work.

The impact of smoking control programmes in various developed countries is already substantial. In some countries, the campaign against tobacco has led to a drop in cigarette smoking, and the decline appears to be accelerating. Cessation of smoking was especially notable among white men in rural areas; by the mid-1980s lung cancer had correspondingly started to decrease in that segment of the population.

Effective anti-tobacco activities will have a wider effect than reduction on smoking-associated cancers only, since tobacco, as a risk factor, is important in other diseases, such as cardiovascular diseases, respiratory diseases and perinatal mortality. The effect of passive smoking on respiratory diseases in infants and children and on lung cancer in non-smokers is relevant in demonstrating that tobacco use is not purely a personal responsibility. What is needed is a commitment from the authorities in each country to support the implementation of measures. This will involve, at the very least, a decision at the cabinet level, to prevent conflicting policies emanating from different ministries.

In developing an anti-tobacco programme, a general and specific set of objectives should be formulated. Examples of specific objectives include: reducing the number of young people starting smoking; increasing the number of people giving up smoking; educating all schoolchildren about the effects of tobacco on health; informing smokers about the benefits of smoking cessation and the steps they can take to stop smoking; and creating a smoke-free environment to minimize the effects of passive smoking.

Process measures should be included, such as establishing health education programmes, especially for schoolchildren; establishing a clear policy on legislative measures, especially price increases and tax on cigarettes; establishing a multiministerial, and multidisciplinary national anti-tobacco committee.

Evaluation of the programme is needed to assess the success of the processes and to determine whether the expected outcome is achieved.

TOBACCO CONTROL REQUIRES:

- in the short term, a study of the prevalence of smoking, with determination of the proportion of adolescents and adults who are regular smokers;
- the percentage of school curricula and adult literacy programmes in which information on tobacco has been included;
- in the medium term, an evaluation of the change in the incidence of non-cancer conditions, such as coronary heart disease and respiratory diseases;
- in the long term, an evaluation of the changes in the incidence and mortality from tobacco-related cancers such as lung cancer.

ACTIONS IN A NATIONAL ANTI-TOBACCO PROGRAMME:

- establishment of a national anti-tobacco council or committee;
- appointment of a manager or coordinator of the programme with appropriate support (e.g. NCCP coordinator);
- implementing a sampling survey to identify the prevalence of tobacco use;
- setting up a three-fold strategy based on the following:

  Education, especially of schoolchildren from the sixth grade onward, public education, integration with related messages for heart and lung diseases and the use of the media;

  Legislation, including taxation measures, regular price increases, a ban on advertising, warning labels, non-smoking policies in public places, a ban on (and enforcement of such a ban) tobacco sales to minors, withdrawal of subsidies to the tobacco industry, encouraging alternative crops in tobacco areas and regulating tobacco exports;

  National leadership to promote advocacy, involving both governmental and nongovernmental organizations and to ensure international collaboration in non-smoking policies and reduction in tobacco trade.

DIET AND CANCER

Certain dietary patterns may be causally related to cancer.

Available data indicate a high correlation between dietary fat and the occurrence of cancer in the breast, prostate, endometrium, ovary and colon. The relationship between dietary cholesterol and carcinogenesis is not clearly understood.

Some epidemiological studies have provided evidence that dietary fats are a determinant of breast cancer risk. A combined analysis of case-control studies has shown a significant effect of total and perhaps particularly saturated fat in increasing the risk in postmenopausal women. For colorectal cancer there is greater evidence of the effect of fat in increasing the risk. There is also some evidence that prostate and ovarian cancers are associated with high intake of foods rich in animal fat.

Studies on the decline of stomach cancer in most countries suggest that the trend is related to changes in dietary patterns, particularly a decrease in the use of salt and pickling for food preservation. The latter practices commonly involve certain chemicals which are known to combine with protamines in the stomach to produce powerful carcinogenic agents, nitrosamines. Increased consumption of charred, smoked, salted and pickled foods is associated with increased risk of stomach, oesophageal and nasopharyngeal cancer. Other ways of preparing food may also be responsible for some cancers; for example, broiling meat and fish can produce substances that are carcinogenic to animals, but their role in cancer in humans is not clear.

High consumption of fruits and vegetables has been associated with reduced risk of cancer. Evidence is accumulating that the incidence of colorectal and other cancers (especially stomach and perhaps oesophageal cancer) is reduced in consumers of vegetables and fruits. For the development of cancer in other sites, persons with low fruit and vegetable intake have been reported to experience a higher risk than those with high intake. There is increasing evidence of the protective effect of some constituents of fruits and/or vegetables.

Certain naturally occurring contaminants in food, such as aflatoxins, are carcinogenic. Food can also become contaminated with chemicals known to cause the disease. In general, however, contaminants are responsible for only a small amount of diet-induced cancer. Alcohol is one of the proved causes of cancer.

Excessive alcohol intake can be associated with increased risk of cancer in the oral cavity, pharynx, larynx, oesophagus and liver. This potential risk is enhanced by smoking.

Substances added to food as preservatives or to enhance the colour of food may also be carcinogenic. Guidelines for setting maximum levels for additives, contaminants and pesticide residues based on the joint WHO/FAO recommendations should be enforced.

STRATEGIES FOR CANCER PREVENTION THROUGH DIETARY MODULATION

Based on the available literature, prevention of cancer by dietary means can generally be approached by observing the following dietary principles:

DIETARY MODULATION:

- **reduction of fat intake;**
- **increase in the intake of vegetables, fruits and whole grain cereals;**
- **maintenance of ideal body weight by a combination of adequate exercise and a moderate-calorie diet;**
- **prevention of contamination of foods by carcinogens, for example aflatoxin and chemicals used as pesticides, and avoidance of any substance that may be carcinogenic or lead to the formation of carcinogens–for example, nitrites and nitrates;**
- **limiting consumption of salted, smoked, charred and pickled food; and**
- **limiting consumption of alcohol.**

The dietary prevention of cancer should take into consideration the local culture, customs, availability of variety of fruits and vegetables and cost. Coordination between health services, agricultural and social welfare departments, educational institutions, media, community organizations and the food industry is essential.

CONTROL OF INFECTIONS ASSOCIATED WITH CANCER

Hepatitis B is one of the major public health problems in the Region. The prevalence of hepatitis B surface antigen (HBsAg) chronic carrier rate ranges from 2% to over 10%. It has been estimated that about 20 million inhabitants of the Region are carriers, and that one out of four chronic carriers will die in later life from diseases caused by hepatitis B virus (HBV). HBV infection is associated with increased occurrence of liver cancer which is one of the most important cancers in young men in developing countries.

An effective vaccine against HB has been available for over a decade. Hepatitis B vaccination, as part of the Expanded Programme on Immunization (EPI), can be an effective strategy in preventing liver cancer. The cost of HB vaccine, however, though

dramatically reduced over the years, remains the major impediment for its routine, nationwide implementation.

In spite of many public health problems competing for finite resources, the Eastern Mediterranean Region, in general, has accorded sufficient priority to the control of hepatitis B; so far, 10 countries have already incorporated routine HB vaccination through their national EPI, and four countries are in the process of doing so.

There are, however, some countries where hepatitis B is an important public health problem, but economically they are not in a position to launch nationwide HB vaccination of infants through routine EPI, unless external support is forthcoming.

Schistosomiasis is another important condition that may be associated with increased occurrence of cancer. There is enough evidence to indicate an association of *S. haematobium* infection with bladder cancer in countries such as Egypt and Iraq. Individuals with concurrent schistosomiasis develop malignancy at a lower mean age than non-infected cohorts do and, among them, 44-82% have squamous cell carcinoma of the bladder. Data available indicate the role of cofactors in inducing bladder cancer, such as chronic bacterial infections that lead to an increase of nitrosamine and carcinogenic metabolites in the bladder.

Association of *S. haematobium* with cancer of the female genital organs, and *S. mansoni* with splenic lymphoma, colorectal and hepatocellular cancer has also been reported.

The most feasible approach to preventing schistosomiasis-associated bladder cancer is through control of schistosomiasis. The main approaches for control strategy are passive and active case-finding in endemic foci, treatment of cases, health education and snail control. Integration of schistosomiasis control into the primary health care system, such as has been achieved in some EMR countries, increases the population coverage for case-finding and treatment.

The manifestations of the epidemic of acquired immunodeficiency syndrome (AIDS) include Kaposi's sarcoma and lymphomas. Education on sexual and reproductive aspects and avoidance of other causes of transmission is the main approach to prevention.

EXPOSURE TO SUNLIGHT AND CANCER

Excessive exposure to sunlight can increase the risk of skin cancer. Squamous and basal skin cancer is highly preventable by educating people to avoid unnecessary exposure to sunlight.

II. Early detection

The objective of early detection is to ensure diagnosis in the early course of cancer when treatment is most effective and a cure more likely.

There are two major approaches to achieve this.

Community education

The public is educated on the signs and symptoms and how to seek medical advice at an early stage. People may be alerted as to the significance of lumps, bleeding, cough and other symptoms indicative of potential malignant diseases. They may also be encouraged and instructed how to look regularly for early lesions by examining the breast for lumps, the oral cavity for abnormalities, and skin for suspected lesions. Educating the public in general on the importance of early diagnosis can promote early detection and reduce mortality.

Together with education of the public, such an approach also requires intensive efforts to increase the awareness and promote training of health care professionals in an attempt to downstage common cancers that are potentially curable. Mechanisms for early referral and accurate diagnosis should be instituted.

Early detection through screening programmes

The feasibility and cost-effectiveness of screening and early detection programmes are determined by the type of cancer, incidence of the disease, the availability of resources needed for implementing screening and ensuring effective intervention. Cancers of the uterine cervix, breast and oral cavity are potential candidates for screening.

Screening for cancer of the cervix

Cancer of the uterine cervix is common among women in developing countries. Screening and effective intervention has been demonstrated to achieve a major reduction in mortality. Cervical smear can reveal cervical dysplasia, as well as early lesions for which treatment can be highly effective. Experience in some developed countries has demonstrated a sharp reduction in the incidence of cancer of the cervix.

It has also been shown that the risk of cancer is low for the first five years following a negative cytology smear, especially after two negative smears. This has served to demonstrate that annual smears are not always required. In fact, studies have shown that after one negative cytology smear, screening once every three years is almost as effective as annual screening among women aged 35-64 years. It may, therefore, be recommended that in countries where resources are scarce, the aim may be to screen every woman once between 35 and 40 years of age. The frequency of testing can, of course, be increased as

more resources become available, the ideal situation being to screen women aged 25-60 once every three years.

Visual inspection of the cervix with a speculum is an integral part of good clinical practice in women with symptoms. The assumption that all the benefit of cervical cytology screening comes from the smear can be challenged. This, and the recognition of the reduction in morbidity and the stage shift that could result from the earlier detection of the disease that would otherwise present at an advanced stage, has led to great interest in visual inspection as the primary screening modality in some developing countries.

Carefully planned visual inspection programmes are now being evaluated in a number of centres in several developing countries.

Breast cancer screening

There is now little doubt that mammography, alone or in combination with physical examination of the breasts, is effective in reducing breast cancer mortality in women over the age of 50 years. For women aged 40-49 years, however, the evidence shows that there is no effect, at least in the first ten years after initiation of screening. Even if a delayed benefit is eventually shown, the cost-effectiveness of screening in this age group is low.

For women over the age of 50, organized programmes have been initiated in several developed countries. In some countries, emphasis on mammography alone may not always be justified, especially for countries that cannot afford its high technology, cost and the skilled professional requirements. The place of breast self-examination (BSE) also must be considered. There are indications that breast cancer mortality in good BSE-compliers is lower than in those who practice the technique poorly or not at all. Large-scale clinical trials are now in progress to evaluate the effectiveness of BSE.

Colorectal cancer screening

Recent evidence suggests that sigmoidoscopy and faecal occult blood tests are possibly appropriate for colorectal cancer screening. There is now evidence to support both. However, the acceptability and cost-effectiveness of screening have not yet been established, and, in the NCCP, primary prevention of this disease may have higher priority than screening.

Screening for other cancers

Visual inspection for oral cancer and skin cancer (including melanoma), often accompanied by public education on primary prevention and early detection, is being advocated in some countries. Such programmes need further evaluation.

In conclusion, the high costs of screening, both of the tests and of the management of abnormalities, indicate that screening alone is not an optimal approach to comprehensive

cancer control, and that it should be regarded as complementary to other more effective approaches. Furthermore, a prerequisite of effective screening is that effective treatment of the detected cancers must be available, and that treatment of earlier stage disease is more effective than of late stage disease.

Therefore the role of screening, in the NCCP, must be evaluated carefully in comparison to other approaches. However, health education leading to earlier referral of curable cancer is an essential part of early detection programmes.

III. Treatment

Primary treatment includes surgery, radiation therapy and chemotherapy.

It is essential to integrate early detection programmes into appropriate treatment programmes, and define clearly those patients in whom there is a potentially curative treatment option. Surgery and radiotherapy may also have an important role to play in improving the quality of life, and in potentially prolonging life in patients with locally extensive tumours.

Facilities for surgery must be available for simple diagnostic/treatment procedures at the local/district hospital level. The primary care team must know where and to whom to refer patients with apparently curable cancers.

Radiotherapy can be curative for some cancers (e.g. head and neck, cervix) and can provide substantial palliation for others. Treatment policies should be established. Relatively inexpensive cobalt therapy machines may be easier to maintain and may be considered, in some situations, to provide adequate therapy or palliation for the majority of patients without resorting to expensive and service-demanding linear accelerators or other high-energy machines.

Chemotherapy can be curative for some cancers (e.g. childhood leukemia, Hodgkin's disease, testicular cancer) and may provide palliation for others. Endocrine therapy (e.g. tamoxifen) is of substantial value in breast cancer. There exist more than 80 cytotoxic drugs[1]. A WHO consultation has recently recommended a list of 14 necessary drugs considering both their cost-effectiveness and their lifesaving potential. The WHO list of essential drugs in oncology is listed in Annex 4. This list can be modified and expanded by national programmes so as to respond to local needs and existing resources. Most are available as generic drugs, though quality control should always be ensured.

A treatment policy should also be developed and specific targets should be set.

[1] "Essential drugs for cancer chemotherapy" in *Bulletin of the WHO*, 1994, 72(5).

Guidelines for treatment may be established for each cancer. These should be based upon realistic estimates of the chance of cure and the availability of resources. EMRO has taken the initiative and, with the support of a Task Force on Breast Cancer, has developed guidelines for management of breast cancer.

Efficient implementation of treatment policy will require careful consideration of the distribution of resources, and the establishment of clear guidelines for referral practices between the various types of institutions.

The NCCP should set up mechanisms for deciding upon guidelines for integrating treatment resources with early diagnosis and screening programmes, and for providing optimal therapeutic management for the most important cancers within a country.

IV. Pain relief and palliative care

In developed countries, 67% of male and 60% of female cancer patients die of their disease; in developing countries, the figures are much higher. Of the eight most common forms of cancer, five are more prevalent in developing countries. Table 8 shows that even if diagnosis is made at an early stage, treatment is curative in only three types, but palliative care is needed in all eight.

TABLE 6. **Cancer control–priorities and strategies for the eight most common cancers**

Site of cancer	Primary prevention	Early diagnosis	Curative treatment[a]	Palliative care
Stomach	+[b]	–	–	++
Lung	++	–	–	++
Breast	–	++	++	++
Colon/rectum	+	+	+	++
Cervix	+	++	++	++
Mouth/pharynx	++	++	++	++
Oesophagus	–	–	–	++
Liver	++	–	–	++

Source: *Cancer Pain Relief and Palliative care*. Technical Report Series 804, WHO, Geneva, 1990.

[a] Curative for majority of cases with a realistic chance of early diagnosis.

[b] ++ = effective; + = partly effective; – = not effective.

Published reports indicate that a substantial proportion of cancer patients experience pain. It has also been estimated that at least four million people are currently suffering from cancer pain, with or without satisfactory treatment. Numerous reports also indicate that cancer pain is often inadequately treated.

Considerable improvements in quality of life for cancer patients and their families could be achieved by implementation of existing knowledge of pain and symptom control. Globally, however, palliative care is still a neglected area and, as a result, several million cancer patients suffer needlessly every day.

MAJOR OBSTACLES TO THE IMPLEMENTATION OF PALLIATIVE CARE:

- **absence of national policies on cancer pain relief and other aspects of palliative care;**
- **lack of education for health care workers, administrators and the general public;**
- **concern that the medical use of morphine and related drugs will worsen the problem of drug abuse in the community, thus resulting in increased restrictions on prescriptions and supply; and**
- **shortage of professional health care workers empowered to prescribe analgesics and other drugs.**

Although it is the only realistic option for a considerable proportion of cancer patients, palliative care attracts few of the available cancer control resources. Most resources are devoted to curative treatment, at a relatively high cost, but with limited effect.

Since for most cancer patients no curative treatment exists, the quality of life for these patients would be greatly improved by access to palliative care throughout the course of their illness.

FULLY DEVELOPED PALLIATIVE CARE PROGRAMMES INCLUDE:

- ***Home care.*** **Palliative care stresses the home as the primary setting of care. Institutions are seen as back-up resources, rather than as the focal points of the programmes.**
- ***Consultation service.*** **Health care workers who are trained in palliative care provide a consultation service for patients in the hospital and in the community.**
- ***Day care.*** **Patients who live alone or who are unable to get out on their own may benefit from attending a palliative day-care centre.**
- ***Inpatient care.*** **Inpatient care concentrates on controlling pain and other manifestations of physical and psychosocial distress.**
- ***Bereavement support.*** **Some people need extra help to enable them to cope with their bereavement. Support by trained health care workers or volunteers may provide this.**

Experience confirms that treatment with non-opioid, opioid, and adjuvant drugs is the mainstay of cancer pain management. Effective use of these drugs requires an understanding of their pharmacological characteristics, the selection of a particular drug being related to the needs of the individual patient.

The WHO three-step analgesic ladder is recommended (see Annex 2). Mild pain can be treated with non-opioids, such as aspirin or paracetamol or any other non-steroidal anti-inflammatory drug. Patients with moderate pain can be prescribed codeine or an alternative opioid for mild to moderate pain if non-opioid drugs are ineffective; the two groups of drugs can be combined in some cases. Those with severe or persisting pain require oral morphine.

Assessing the magnitude of cancer

Cancer registration is the continuing process of collection of data on the characteristics of all patients with cancer and involves the systematic collection, storage, analysis, interpretation and reporting of data.

Cancer registries may be population- or hospital-based.

A population-based cancer registry (PCR) collects data on every patient with cancer in a defined population. Usually, the population is within a well-defined geographical region. The cooperation of the medical profession and health care services is vital to the success of cancer registration. The PCR provides incidence rates, and emphasis is on epidemiology and public health.

Since population registration involves head counts of new cancer cases occurring in a defined time period and relates this to the 'population risk', the availability of reliable population census data by sex and five-year age groups is essential.

MAIN SOURCES OF INFORMATION FOR A POPULATION-BASED REGISTRY:

- **information from treatment facilities, such as cancer centres, major hospitals, private clinics, hospices, homes for the elderly and general practitioners;**
- **information from diagnostic services, especially pathology laboratories, but also haematology, biochemical and immunological laboratories, X-ray and imaging clinics; and**
- **death certificates from the death registration system (if available).**

The information is collected from these sources in two ways:

- ***active collection*** which involves registry personnel actually visiting the different sources and abstracting the data on special forms (this is the usual method of registries in developing countries); and
- ***passive reporting*** through health care workers completing the notification forms developed and distributed by the registry, or sending copies of discharge abstracts.

The way the data are collected invariably depends upon local conditions. A combination of both procedures, with emphasis on the latter, is followed in most Western registries. The medical records department in a hospital is a major source of information.

The data items to be collected by a registry are again dictated by the purpose for which the registry has been established. However, the emphasis should be on the quality of the data collected, rather than on the quantity. It is important that registries in developing countries collect only the basic information common to all registries which includes personal identification data, such as name, sex, birth date, and demographic data, such as address and ethnic group, and data on the tumour which should cover incidence date, most valid basis of diagnosis, site, history, behaviour and source of data.

The International Classification of Diseases, Tenth Revision (ICD-10) must be used universally to describe the *topography* (site of primary tumour) and *morphology* (histological type).

Information provided by the cancer registry, when available, on the present and future numbers of cancer patients helps the health authorities in various ways, including long-term planning of the health services and training of health care personnel. The role played by cancer registries in the evaluation of control programmes depends on the objectives of such programmes.

In primary prevention, the role of the cancer registry is usually to observe time trends in the incidence of cancer, to see whether the desired effect of preventive programmes is being achieved. Examples are the monitoring of the incidence of tobacco-related cancer in response to anti-smoking programmes or, over a long-term, of primary hepatocellular carcinoma following hepatitis B vaccination.

In screening and early detection programmes. For example, when screening for cervical and oral cancer the aim is to reduce the incidence of invasive types of cancer. In these cases as well as in screening programmes, such as of the breast, which aim to detect cancers early, the indicator of success will be the proportion of cases discovered in the early stages (downstaging of cancers), and hence a decrease in mortality, rather than reduction in morbidity.

In treatment. Survival statistics produced by some cancer registries through follow-up of registered cancer cases, either actively or by matching death certificates against cancer notifications, may be used to compare the effectiveness of cancer treatment in different populations.

Hospital-based information systems

Hospital-based information systems, such as the medical records department (MRD) and hospital-based cancer registries (HCR), are important elements for the implementation and evaluation of hospital-based cancer care services, which ultimately contribute to the diagnostic and therapeutic base of NCCPs. Hospital-based information systems are vital to the success of an effective population-based cancer registry as well.

A HCR is concerned mainly with the recording of information about the cancer patients seen in the hospital. Its main purpose is to contribute to patient care by providing readily accessible information on patients with cancer, the treatment which they received and its results. The data are used for administrative purposes, and for reviewing clinical performance.

All hospitals (the medical records departments) should develop a system for the storage, retrieval and analysis of hospital records.

In the context of a NCCP, all cancer hospitals and those major hospitals with oncology services should have *a unitary medical records system.* This implies that one cancer patient has only one file and a record number from the date of first interaction (i.e. admission) with the hospital services. The records pertaining to his/her further admissions, treatment, course of disease, follow-up until "cure"/death will be filed in the *unitary record file.* This system allows only one record for both in- and outpatient services. Most MRDs use the *International Classification of Diseases, Tenth Revision* (ICD-10) for coding. MRDs should provide, on an annual basis, minimum information relating to outpatient visits, inpatient admissions, duration of stay in the hospital, utility of diagnostic and therapeutic services, average waiting period for services and hospital-based deaths. They should be accessible to other information systems under purview of codes of confidentiality. The status of the medical record as a legal and confidential document should be ensured by the MRD.

HCRs produce annual reports on the cancers seen in the hospital during the year, giving details, such as the principal cancer sites, age and sex distribution of cancer patients, methods of diagnosis, stage distribution, treatment methods, response to treatment and survival. The HCR data may be used to forecast future demands for services, equipment and human resources in a given hospital. The HCR can contribute considerably to patient follow-up and clinical cancer research.

Death registration systems

An efficient and reliable nationwide death registration system is also very useful for evaluating a cancer control programme. The quality of death certificates is a major limiting factor in many countries. Greater efforts should be made to improve the quality of mortality statistics and death certification by cause.

Data on cancer patterns in the Eastern Mediterranean Region

The existing sources of cancer data in the EMR are shown in Table 7. The completeness, coverage and quality of information available from these sources vary considerably from country to country. Nevertheless, they provide an indicator of the prevailing cancer patterns.

In Bahrain, a population-based registry started functioning on 1 January 1994. However, Bahrain already had a nationwide death registration system. In 1991, 176 cancer deaths occurred, giving a crude mortality rate from cancer of 34.1 per 100 000. The crude mortality rate among Bahraini males was 54.4 per 100 000 and 46 per 100 000 among females. Cancer is the third most common cause of death among Bahrainis.

A population-based cancer registration programme was initiated in Cyprus in 1990. During 1991, a total of 1457 new cancer cases were reported, as compared to 1660 in 1990. Out of the total number, 61.8% were registered officially in the Cyprus Cancer Registry and 38.2% were reported to the Cancer Registry through copies of histopathology reports; 48.2% of cases were males and 51.8% were females. The most common cancers reported in males were skin (27.9%), urinary bladder (11.7%), prostate (11.7%) and lung (11.1%). In females, cancer of the skin (25.7%), breast (24.2%), uterine cervix and ovary and large bowel are the leading types in order of frequency. Regarding agedistribution, about 3% of all registered malignant neoplasms were under 14 years, 25% between 15-54 years and 72% occurred in the age-group 55 years and over.

There is no population-based registration programme in Egypt. Hospital-based data are available from Alexandria, Cairo, Mansoura and Tanta. Figures reported by the Alexandria Cancer Registry are as follows: the common sites among males are bladder (15.9%), lymphoma (13.8%), central nervous system (CNS) (11%), lung (7.9%), colon and rectum (7.1%) and larynx (6.2%), and among females, breast (32.7%) lymphoma (8.1%), CNS (7.2%) oesophagus (5.5%) and cervix (4.5%). Data from the cancer registry of the metropolitan Cairo area for the years 1978-1979 also revealed a very high frequency of bladder cancer, comprising 28.8% of cancers in males and 11.7% of cancers in females. This high frequency has been reported many times before, and is related to the prevalence of schistosomiasis. In females, breast cancer was reported as the dominant tumour and is considerably more common than cervical cancer.

In Iraq, a centralized registry of cancer cases from hospitals and laboratories exists, with more elaborate coverage in Baghdad and Mosul. Bladder cancer was the most common during the years 1978-1985. However, the picture has changed in recent years and lung cancer ranked first during 1986-1991, followed by bladder cancer. Following the achievements made by the schistosomiasis control programme, the histological type of bladder cancer has also changed towards more cases of transitional cell carcinoma and less of squamous cell type. A total of 20 259 cancer cases was reported during the years 1989-1991, 11 149 in males and 9110 in females. The common cancers among males were lung (15.8%), urinary bladder (12.7%), larynx (7.9%), non-Hodgkin's lymphoma (7.1%) and skin (5.6%). The predominant cancers among females were breast (24.3%), skin (52%), non-Hodgkin's lymphoma (5.1%), urinary bladder (5%) and leukaemia (4.9%).

There is no population-based cancer registration programme in Jordan. Hospital-based data from Al-Bashir Hospital, where radiotherapy facilities are available, reveal that 1126 cancers were reported in 1992 (548 males and 578 females). The leading cancers were lung, central nervous system (CNS) lymphoma and larynx in males; breast, lymphoma, CNS, thyroid and cervix in females. Mortality data available in the Ministry of Health for the years 1965-1985 indicate a rising trend. Cancer deaths constituted 2.5% of all deaths in males and 2% in females in 1965, increasing to 4.7% and 6.4% respectively in 1985.

Kuwait has a nationwide population-based cancer registration. Mortality data indicate that cancer is the third most common cause of death. Cancers of the breast and lung are the most common causes of cancer death. The other most common causes of cancer death include cancers of the bladder and liver and leukaemias. The most common cancers in both the Kuwaiti and expatriate male populations, in order of frequency, are bronchus, lymphosarcoma, liver, leukemia, bladder, prostate and stomach. In females, they are breast, thyroid, cervix, bronchus and ovary.

There is no population-based cancer registration programme in Lebanon. Some hospital-based data from general hospital settings are available. The total number of cancers reported is not available. The most frequent cancers among males were urinary bladder (18%), lung (14%), prostate (11%), lymphoma (7%) and colorectal (5.5%). The predominant cancers among females were breast (30%), uterine cervix (12%), colorectal (6%), lymphoma (5%) and ovary (4%).

No data are available on cancer patterns in the Libyan Arab Jamahiriya. However, collaborative activities with WHO on cancer control will be initiated during the 1994-1995 biennium. These will include promotion of cancer information systems.

In Morocco, a population-based registration programme was initiated in Rabat in 1990 and the results are awaited. Hospital-based information from the National Institute of Oncology, Rabat, is available. During 1986-87, 5148 cancer cases were reported. In males, cancers of the

nasopharynx (12.3%), lymphoma (10.1%), larynx (8.2%), lung (6.5%) and skin (5.1%) predominate. The major cancers among women were uterine cervix (35%), breast (22.3%), nasopharynx (5.3%), lymphoma (3.9%) and ovary (3%).

Data are available from the national cancer registry in Oman, which is based in Muscat. In 1992, 772 cases were reported and the major cancers were lymphomas and leukemias (13%), stomach (12%), breast (6.3%), thyroid (6.1%), lung (5.5%) and cervix (5%).

Hospital-based data are available from six centres in different regions of Pakistan. Efforts are being made to strengthen the existing information systems and to establish a population-based registration programme. The hospital frequency pattern varies according to geographic areas. In the north, cancers of the lymph nodes, head and neck, gastrointestinal tract (GIT) and bronchus predominate among males, while breast, head and neck, cervix and ovary are leading cancers among females. In the south, bronchus, oral cavity, GIT and hypopharynx are the leading cancers among males, and breast, oral cavity, GIT and cervix among females.

TABLE 7. **Data sources in Member States of the EMR**

Member State	Sources available*
Bahrain	3, 4
Cyprus	1, 4
Egypt	3
Iraq	2, 3
Jordan	3
Kuwait	1, 3, 4
Lebanon	3
Morocco	2, 3
Oman	3
Pakistan	3
Qatar	1, 3, 4
Saudi Arabia	3
Sudan	3
United Arab Emirates	3, 4
UNRWA	3

* 1. Nationwide population registration; 2. Population registration covering a sample of the population; 3. Hospital-based information systems; 4. Mortality statistics.

Source: Report of the Intercountry Meeting for National Cancer Control Programmes, WHO-EM/CAN/79-E/L).

Nationwide cancer registration was initiated in Qatar by the oncology unit at Hamad Medical Corporation in 1988. In 1991 and 1992, 216 and 224 cases were reported respectively, and approximately half of the cases were among expatriates. The leading cancers in males were lymphoma/leukaemia (25%), skin (12.5%), lung (11.7%) and colon/rectum (10.9%). The major cancers among females were breast (33%), uterine cervix (8.3%), thyroid (8.3%) and lymphoma (5%).

No population-based registration programme exists in Saudi Arabia at present, but plans have been made to initiate such a programme in 1994. In a report of the 11 204 cancer cases referred to King Faisal Specialist Hospital, non-Hodgkin's lymphoma, lung cancer, oesophageal tumours and hepatic neoplasms were the most common cancers found among male patients. In females, the most common tumours are breast cancer, malignant lymphoma and oral cancer. The incidence of cancer has been estimated to be around 800 new cases per million population per year. More than 70% of cancer patients are reported to be admitted to hospitals in an advanced stage. Hospital-based information available from cancer treatment centres indicates that lung cancer is a major problem.

No population-based cancer registration programme exists in Sudan. Hospital-based data from the Radiation and Isotope Centre in Khartoum indicate that 1648 cancers were registered in 1992. Leading cancers in males were nasopharynx (11.9%), non-Hodgkin's lymphoma (10%), skin (7.4%), connective tissue tumours (8%), gingiva (5.7%) and urinary bladder (4%). Among females, cancer of the breast (34.5%), uterine cervix (14.3%) ovary (3.4%), gingiva (3.3%), oesophagus (3.3%) and non-Hodgkin's lymphoma (3.2%) were the leading cancers.

Data on cancer mortality in the United Arab Emirates is now readily available and is reported regularly to the concerned health authorities by all medical districts. Cancer mortality registration is based on the ICD coding system and provides information on the distribution of cancer deaths by site, age, gender, geography and nationality. Cancer was the third leading cause of death in the country, preceded only by cardiovascular diseases and accidental injuries. A review of about 2000 randomly selected cancer cases reported in 1986 showed that the five most common cancers among males of all ages were cancers of the digestive system and peritoneum, haematopoietic and lymphatic systems, head and neck, trachea, bronchus and lung and urinary tract, in that order. They constituted 79% of all cancers in males. The five most common cancers among females were cancers of the breast, genital organs, haematopoietic and lymphatic systems, digestive organs and peritoneium and endocrine glands, in that order. These five types constituted 76% of all cancers in females. The most common cancers which led to death among males were cancer of the bronchus followed by cancer of the stomach, colon and rectum.

The United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) has some information on cancer among the 2 797 000 Palestinian refugees. A total of 895 cancer cases have been reported by UNRWA. The most common cancers were breast (31%), cervix (13%), lymphoma (10%), leukaemia (8%) and lung (3%).

The above data from the countries illustrate significant variations in their cancer profiles which should be taken into consideration when planning and implementing national cancer control programmes (NCCPs). While cancer of the lung appears to be the leading cancer among males in many countries, other types of cancer such as lymphomas/ leukemias, bladder and nasopharyngeal neoplasms may be more important in other countries. In females, breast cancer is the leading type in most countries but cancer of the uterine cervix appears to predominate in Morocco.

Effective monitoring and evaluation of NCCPs in Member States will certainly require strengthening of the existing cancer information systems, particularly in those countries where such systems have not yet been established.

Diagnostic and therapeutic facilities in the Region

Pathology, cytology and imaging services are generally available in all countries, although they are more widely available in some Member States than in others. Table 7 provides an overview of diagnostic and treatment facilities in Member States. Comprehensive cancer centres are available in about one-third of them. Radiotherapy facilities are available in most countries. Committed cancer surgery services function in some of the countries, while medical oncology and paediatric oncology units operate in most countries.

TABLE 8. **An overview of diagnostic and therapeutic facilities for cancer in the Eastern Mediterranean Region**

	Bahrain	Cyprus	Egypt	Iran, Islamic Republic of	Iraq	Jordan	Kuwait	Lebanon	Libyan Arab Jamahiriya	Morocco	Oman	Pakistan	Qatar	Saudi Arabia	Sudan	Syrian Arab Republic
Comprehensive cancer treatment centres			•	•			•			•		•			•	
Cancer treatment facilities as part of medical schools/general hospitals	•	•	•	•	•	•		•		•	•	•	•	•		•
Private cancer treatment facilities	•	•	•	•				•	•	•		•		•		
Pathology services	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Cytology services	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CT scanners	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Radiotherapy facility		•	•	•	•	•	•	•	•	•		•		•	•	•
Palliative care: morphine available	•	•	•	•	•	•			•	•	•	•	•	•		•
Pain clinics			•	•	•	•										

Source: Report of the Intercountry Meeting for National Cancer Control Programmes, (WHO/EM/CAN/79-E/L).

Cancer Control: priorities and approaches in the Eastern Mediterranean Region

Problems and needs in cancer control vary from one region to another. Priorities, targets and approaches adopted by the NCCP will, no doubt, depend on the regional situation and the availability of resources and capabilities that determine the feasibility and cost-effectiveness of activities.

Various issues relevant to cancer control in EMR countries were discussed during the Intercountry Meeting of National Cancer Control Programmes. The following is a brief account of the approaches generally recommended, although each country will still have to consider the feasibility of these approaches and the need to adapt them to local circumstances.

Data collection and development of cancer registries

- While data derived from cancer registries are desirable, they are not mandatory for establishing an NCCP. The minimum information required for NCCP formulation includes baseline demographic data and cancer incidence data, when available.
- Other useful data include information on prevailing lifestyles, available staff resources, diagnostic and treatment facilities, stage distribution at the time of diagnosis and survival and mortality information.
- In countries where the occurrence of cancer is significantly influenced by other health problems, such as hepatitis B and schistosomiasis, information on the epidemiological characteristics of these problems should also be obtained.

National programme formulation

A cancer control programme should contain the following elements:

PREVENTION

Priorities for prevention will vary depending on the situation within each country. There are, however, some general preventive measures that should be considered in all countries.

PROMOTION OF TOBACCO CONTROL:

- **It is essential to adopt feasible approaches to promote tobacco control at national and regional levels. Health education is of paramount importance. Education of schoolchildren on the harmful effects of tobacco and other unhealthy lifestyles, as part of a comprehensive school health programme, should be emphasized.**
- **Assessment of the baseline magnitude of the smoking problem should be carried out and will help in evaluating the impact of public education.**
- **Government involvement is needed for legislation and enforcement of legislative measures. Such measures include banning of all tobacco advertising in the mass media, banning of smoking in public places and on public transport and reducing tar and nicotine levels in cigarettes.**
- **The role of nongovernmental organizations and the potential use of the media should be emphasized. Teachers and health professionals should provide examples or role models to the rest of the population.**
- **There is a need to formulate educational materials and evaluate their effectiveness and use in the Region. A full-time focal point for the tobacco control programme is needed at the national level and a multisectoral tobacco control committee should be established.**

PROMOTION OF HEALTHY EATING HABITS AND DIETARY GUIDELINES:

The community should be educated about healthy eating habits and the components of a healthy diet.

- Guidelines on diet should be formulated and should focus on:
  - encouraging a low fat diet, particularly a diet low in saturated fats;
  - increasing consumption of fruits and vegetables and high-fibre foodstuffs,
  - avoidance of excessively refined carbohydrates, and
  - avoidance of potentially harmful food additives.
- A national committee on food and nutrition should be established and national dietary and nutritional guidelines should be formulated. Special coordination with control programmes for other noncommunicable diseases, such as cardiovascular diseases and diabetes, is extremely important.
- Close collaboration with other governmental and nongovernmental agencies can be extremely useful.

CONTROL OF INFECTIONS ASSOCIATED WITH CANCER:

- Hepatitis B vaccination should be strengthened as part of the routine EPI. Resources should be sought to promote comprehensive coverage and to ensure implementation of national programmes.
- Schistosomiasis control programmes should be strengthened in countries where schistosomiasis and associated bladder cancer represents a significant problem. Efforts should be made to reduce the cost of treatment. Operational and health systems research on the control of schistosomiasis-associated bladder cancer should be encouraged.

CONTROL OF ENVIRONMENTAL HAZARDS:

- Control of environmental contamination and utilization of hazardous (carcinogenic) chemicals and processes in the occupational environment should be promoted.

EARLY DETECTION/SCREENING

- The first priority is to promote public and professional education for the early diagnosis of cancer.
- Screening programmes may not be feasible in many countries in view of the critical availability of personnel, limited diagnostic and treatment facilities, and the need for effective public education programmes to achieve adequate coverage of the population. However, such programmes can be initiated as pilot projects in countries where the necessary facilities exist.
- There is a need for early diagnosis "downstaging" of common cancers for which treatment methods are generally effective. Efforts for early detection should focus on improving the awareness of the general public about the early symptoms and potential cure of commonly encountered cancers as this will enable people to seek medical attention at an early stage.
- Orientation of the health profession through continuing education in order to improve awareness among doctors, nurses and health workers should be another major activity.
- Breast self-examination (BSE) should be promoted among women aged 30 years and over through primary health care (PHC) units and maternal and child health (MCH) centres, public education programmes and women's groups. Those with abnormalities should be encouraged to report to primary care physicians or MCH centres who will refer them for specialized medical care, if the need exists.
- Clinical breast examination of women whenever they interact with the health care system should also be promoted.
- Those countries with adequate cytology facilities should promote Pap smears once every 3-5 years among women aged 35 years and above.
- Visual inspection may be used to detect early oral lesions and precancerous lesions in those countries where oral and cervical cancers are common.
- Although national screening programmes are difficult to implement, depending on the priorities, demonstration projects may be initiated to:
  - evaluate the applicability of programmes promoting BSE by women from the age of 30 years;
  - evaluate the cost-effectiveness of programmes of clinical breast examination combined with BSE among women, aged 40-59 years;
  - determine the efficacy of visual inspection of the cervix as a means of downstaging of the disease in women, aged 35-59 years;
  - assess the applicability of methods to screen women, aged 35-39 years, with Pap smears every three years;

- evaluate the efficacy of visual inspection (and palpation) for the early detection of oral cancer among smokers and chewers of tobacco, aged 30 years and above.

Whenever possible, such programmes should be designed to be compatible with existing WHO-supported early detection protocols.

TREATMENT

It is worthwhile to attempt to establish a comprehensive cancer centre in each country by pooling existing facilities and strengthening them with additional facilities as local resources permit. Such a centre should eventually aim to provide cancer surgery, radiation therapy, medical oncology, paediatric oncology, pain relief and palliative care, medical records, hospital registry, comprehensive imaging, pathology/cytology, community oncology and other supportive services. The centre should operate through an appropriate referral policy.

The centre should:

- act as a resource of excellence in modern multidisciplinary cancer care;
- serve as the main focus for training of personnel for secondary and primary care institutions;
- provide consensus policy guidelines for the management of common cancers in the country;
- promote human resources development;
- provide leadership roles in prevention and early detection activities, as well as local need-based cancer research;

- In countries where resources are significantly limited, the minimum facilities required in a cancer centre should include basic radiotherapy services, surgical oncology, cancer chemotherapy and medical records.
- A list of essential drugs for oncology should be formulated and implemented.

Training of oncologists in surgery, radiotherapy and chemotherapy should be strengthened. Development of human resources in pathology, cytology, imaging and epidemiology is also needed. Training opportunities for physicists, radiotherapy technicians and nurse oncologists should be considered.

PAIN RELIEF AND PALLIATIVE CARE

- The WHO approach to the treatment of cancer pain is recommended. (WHO, *Cancer Pain Relief*, TRS 804, WHO, Geneva, 1990).
- Availability of drugs used for pain relief, including oral morphine, is a basic requirement for palliative care. In many countries of the Region, this service is not readily available, and in these countries, legislation to ensure availability of oral

morphine may be needed. Education of health care professionals, patients and relatives on the low potential for addiction is needed. Basic logistic guidelines and records can prevent misuse.

- Medical and nursing curricula should ensure the acquisition of knowledge, skills and attitudes on pain relief and palliative care.

Guidelines for the establishment of NCCPs in the Eastern Mediterranean Region

The following guidelines have been formulated during the WHO Intercountry Meeting on National Cancer Control Programmes held for national coordinators of cancer control, in the Eastern Mediterranean Region Member States (Cairo, Egypt, 22-25 November 1993).

Preparation stage

- **Political commitment** is essential and the continuity of such commitment should be ensured. Policy-makers at the highest level should be well informed about the increasing dimensions of the cancer problem.
- The Ministry of Health should be convinced of the need to provide **sufficient financial resources** for the cancer programme. Every effort should be made to raise additional funds from governmental and nongovernmental sources. Extrabudgetary funding from international organizations and agencies may also be possible for some national programmes. Local need-based research initiatives may also attract resources.
- **Acceptable, motivated and charismatic leadership is essential**. The leader of the programme should have adequate knowledge and background in cancer control with good communication and managerial skills.

Planning stage

- **Establishing a national committee**. The membership of the national committee should include representatives of the Ministries of Education, Social Affairs, Agriculture and Industries, in addition to Ministry of Health departments and related medical and other health specialties. The general public, mass media and interested nongovernmental organizations should also be represented on the committee.

  Responsibilities of the committee should be defined but generally they should include formulation of policies and coordination.

  Subcommittees of limited membership will be needed to achieve specific objectives and tasks.

- **Conducting situation analysis.** Data collection is a basic step in planning a NCCP. The quantity and type of data required will vary from one country to another. However, situation analysis should aim to provide information on the magnitude of cancer in relation to other diseases and data on trends and future projections of the cancer burden.
- **Reviewing existing facilities and human resources** for cancer control is essential. Minimum standards of health care for cancer patients should be defined and adopted.
- **Determining priorities.** Priorities are determined by the local situation and epidemiological trends. They relate to cancers that are prevalent. The selected priorities should be potentially feasible. Among locally prevalent cancers, preventable ones should receive emphasis together with those amenable to early detection and treatment. The following should be considered as possible priority activities:
  - promoting tobacco control, using public education, legislation and organizational approaches;
  - focussing on public education to increase awareness of cancer and the early diagnosis of the most prevalent cancers in the country;
  - strengthening professional education to promote the skills of health care professionals, especially in primary health care in educating their patients on the importance of cancer, how to recognize the early signs of cancer and to refer patients for diagnosis and treatment;
  - promoting the availability of oral morphine and promotion of the training of health care professionals in its use for adequate pain relief and in other requirements of palliative care;
  - providing facilities and trained staff required for the diagnosis and treatment of all potentially curable cancers.

Setting goals and targets. While targets will depend on the priorities set by the NCCP.

GENERAL GOALS OF A NCCP ARE:

- **to prevent tomorrow's cancers;**
- **to diagnose cancers early;**
- **to provide curative therapy;**
- **to ensure freedom from suffering;**
- **to reach all people in need.**

Specific targets should be set which are practical and achievable within reasonable time-limits.

- Process measures are of fundamental importance for an effective NCCP.

PROCESS MEASURES TO BE CONSIDERED:

- **health education in schools on the harmful aspects of tobacco and the importance of healthy lifestyles;**
- **implementation of legislation banning smoking in public places and on public transport;**
- **professional reorientation through continuing medical education;**
- **public education on symptoms and curability of common cancers and self-examination procedures;**
- **implementation of consensus treatment policies.**

OUTCOME INDICATORS MAY INCLUDE :

- **reduction in the prevalence of changes in dietary trends,**
- **tobacco habits, knowledge, awareness and practice patterns of the general population, stage distribution of common cancers, five-year survivals and ultimately mortality.**

Implementation stage

- **Emphasizing the role of primary health care centres**
  Primary health care (PHC) has a major role to play in public health education and early detection. The medical, paramedical and community workers of the PHC centre should be the resource persons for cancer control activities and should be a major and effective link in the referral chain. Responsibilities should be defined according to the level of health professionals in each country.
- **Ensuring linkage with control programmes of other diseases**
  There should be linkage with other programmes, such as control of cardiovascular diseases, control of sexually transmitted diseases and AIDS and promotion of nutritional patterns, conducive to the primary prevention of cancer. Close coordination

with hepatitis B vaccination programmes and schistosomiasis control projects should also be planned in places where these diseases present a significant problem.

- **Involving the community**
  The public should be represented on the national committee and other agencies concerned with cancer control. NGOs should be involved in programme implementation. NGOs should also contribute to fund-raising, public and professional education, fellowships and patient care. Newsletters and news items from the NCCP should aim at informing the public of the current situation.
- **Role of cancer centres**
  Cancer centres should be in the forefront of primary and secondary prevention of cancer. They should provide a leadership role in cancer control and human resources development. They should be encouraged to develop and disseminate consensus protocols for the management of common cancers in the Region and initiate health systems research.
- **Educational institutions**
  Medical/nursing educational institutions should also play an active role in public education. Management guidelines for the programme should be developed based on the experience obtained from existing programmes.

Monitoring and evaluation

Information systems should be developed within the scope of the NCCP to provide for monitoring and evaluation of the programme. The viability of information systems should be ensured by the NCCP.

INDICATORS FOR MONITORING AND EVALUATION:

- **tobacco habit patterns;**
- **changes in knowledge, attitudes and practices (KAP) relevant to cancer;**
- **stage distribution of common cancers;**
- **referral practices;**
- **proportion of curative treatments;**
- **survival from common cancers;**
- **trends in incidence and mortality.**

Research needs

The focus of research by the NCCP should be need-based, rather than academic. Research should focus on elucidating the causes of common cancers, descriptive studies, survival analysis, intervention and health care delivery.

Evaluation of visual inspection and self- and clinical physical examination procedures in terms of outcome modulation, such as stage shifts, and reduction in mortality is another research priority that will help in evolving public health policies on secondary prevention.

Regional plan for the control of cancer

The Regional plan for cancer control was reviewed during the Intercountry Meeting on National Cancer Control Programmes and was endorsed as follows:

General objective

Prevention and control of cancer in the Eastern Mediterranean Region of WHO.

Specific objectives

- To strengthen activities and develop appropriate and comprehensive strategies for cancer control in the Region;
- To support the establishment of effective, functioning, national cancer control programmes in all countries of the Region.

Approaches

WHO will collaborate with Member States and promote:

At the country level

- development of national cancer control programmes as an integral part of the health care system;
- implementation of all components of such programmes, including cancer registries, and an epidemiological assessment of the cancer problem in each country;
- national activities directed towards diminishing human exposure to environmental carcinogens; and
- development of trained human resources for health in cancer prevention, early detection, treatment and palliative care.

At the Regional level

- support for the development of a network of regional centres for the prevention and control of the most important cancers in the Region;
- development and evaluation of teaching and technical material to foster cancer education directed at the community and the health profession;
- collaboration with other international bodies to foster regional actions towards research in all preventive, curative and rehabilitation aspects of cancer control;
- dissemination of technical information and literature on appropriate intervention methodologies and guidelines for cancer control programmes, including aspects of promoting the quality of life of incurable cancers; and
- strengthening of national human resources development in programme management and other cancer control activities.

Targets

1) *By end of 1995*
   - 1.1 at least 20% of countries should have developed comprehensive national plans for cancer control focusing on priorities based on local circumstances;
   - 1.2 another 20% of countries should have carried out situation analysis and initiated data collection activities required for the establishment of NCCPs.

2) *By end of 1997*
   - 2.1 at least 40% of countries should have developed national plans for cancer control;
   - 2.2 at least 20% of countries should have implemented measures to prevent cancer and promote early detection and palliative care of common cancers according to local circumstances.

3) *By the year 2000*
   - 3.1 all countries should have assessed the magnitude and impact of the cancer problem and considered the institution of measures for prevention and control;
   - 3.2 at least 40% should have implemented measures to prevent cancer and to promote early detection and palliative care of common cancers according to local circumstances.

Activities

1. Collaboration by WHO with countries in further development and improvement of cancer information systems (Targets 1.1, 1.3 and 2.3).
2. WHO's support to national efforts in NCCP formulation and implementation (Target 1.1, 1.2 and 2.1).
3. Support to training courses in cancer epidemiology, managerial aspects of NCCP and pain and palliative care activities (Targets 1.2, 2.1 and 3.1).
4. Provision of technical training to countries to respond to their specific needs (all targets).
5. Promotion of cancer education activities in the Region and support to national efforts directed towards the development of appropriate methods for public education on cancer prevention and early detection (Targets 1.2, 2.1 and 3.1).
6. Organization of at least one meeting for national managers of cancer control programmes in countries that have already formulated plans (Targets 1.2, 2.1 and 3.1).
7. Support to health systems research related to cancer control and research addressing important aetiological factors of commonly encountered cancers in countries, as well as other factors such as environmental pollution (Targets 2.2, 2.3 and 3.1).
8. Organization of a regional course on pain relief and palliative care as a model for training of potential trainers (Targets 2.2 and 2.3).

Recommendations made during the Intercountry Meeting on National Cancer Control Programmes

The participants in this meeting, mindful of the considerable magnitude of cancer as a major cause of morbidity and mortality, endorsed the concept of "National Cancer Control Programmes" (NCCPs) as applicable to countries of the Eastern Mediterranean Region and accept the basic principles of NCCPs as described by WHO, and recommended to their governments to initiate, if they have not already done so, the process of planning for a NCCP as soon as possible and for those governments that have already initiated a NCCP, to reaffirm their commitment to the NCCP and ensure that the necessary measures for the efficient management of the programme continue to be available.

The participants also invited the WHO Regional Office to promote awareness on the increasing importance of cancer and the need to initiate control measures by discussing the cancer problem in one of the future sessions of the Regional Committee for the Eastern Mediterranean.

MAJOR RECOMMENDATIONS:

1. **A national committee for cancer control should be established as an essential part of the planning process in countries committed to cancer control. The composition of such a committee will depend on local circumstances, but emphasis should be placed on a multidisciplinary framework.**

2. **Cancer information systems and data collection should be promoted within the countries. As a minimum requirement, hospital-based information systems, such as medical records and hospital registries, should be developed in all institutions dealing with cancer diagnosis and therapy.**

Although a sophisticated registration system is not a prerequisite for the establishment of NCCPs, a population-based cancer registry covering a limited sample of the population, if feasible, will complement monitoring and evaluation of a NCCP.

Where possible, mortality statistics should be improved and strengthened.

3. Primary prevention of cancer should focus mainly on tobacco control and dietary modulation. Close linkage with other noncommunicable disease control programmes is necessary. Coordination is also required with relevant communicable disease control programmes, such as hepatitis B immunization, AIDS prevention and control and schistosomiasis control, in countries where these problems are of significant magnitude.

4. Information/education programmes are the basic approaches for early detection of commonly occurring cancers. Appropriate educational material should be produced by national programmes and regional centres and evaluated with WHO's support.

5. Treatment in cancer centres should be multidisciplinary, with access to the services of a surgical oncologist, a medical oncologist and a radiotherapist, whenever feasible. An efficient referral system should be established. A national list of essential drugs utilized in oncology should be developed and used.

6. Ministries of health and regional institutions should assess the availability of oral morphine for pain relief and introduce appropriate measures to ensure supply of oral morphine at a reasonable cost.

ANNEX 1

Intercountry Meeting on National Cancer Control Programmes,

Cairo 23-25 November 1993

Participants:

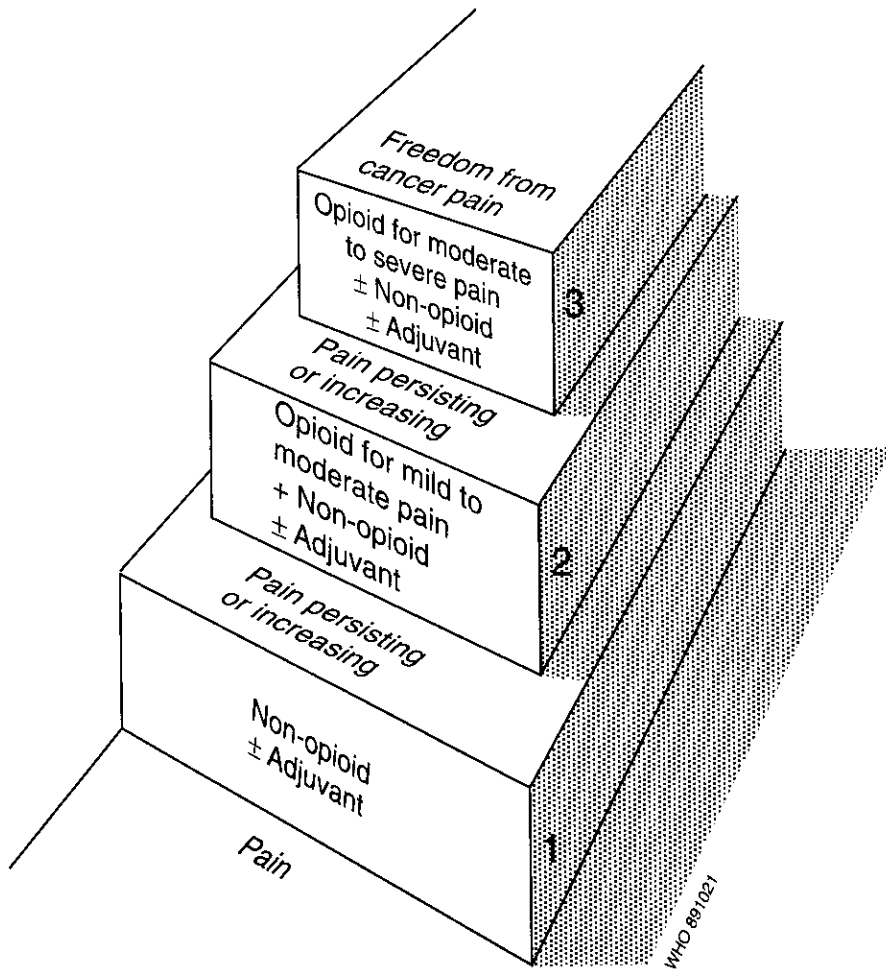
Dr Hussein Mohamed Ahmed, Sudan
Professor S. Mahmoud Alam, Pakistan
Dr Lina Assad, Syrian Arab Republic
Dr Khader Azzam, United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA)
Dr Ramiz Bedwani, Egypt
Dr Noureddine Chaouki, Morocco
Dr Nasser Al Hamdan, Saudi Arabia
Dr Htewich Farag Htewich, Libyan Arab Jamahiriya
Dr Mohamed Ali Jaafar, Oman
Dr Mohamed AL Jaralla, Kuwait
Dr Samir Al Kayed, Jordan
Dr Rita Komodiki, Cyprus
Professor Neil MacDonald, Canada
Professor Anthony Miller, Canada
Dr Krishnan Nair, India
Professor Sherif Omar, Egypt
Dr Yousef Omar, Bahrain
Dr Faiq Al Sameria, Iraq
Professor Najib Taleb, Lebanon
Dr Abdul Azeem Abdul Wahab, Qatar

World Health Organization (WHO):

Dr Ala'din Alwan, WHO/EMRO (Secretary)
Dr Jan Stjernsward, WHO/HQ
Dr Valentin Koroltchouk, WHO/HQ
Dr R. Sankaranarayanan, WHO/IARC

ANNEX 2

*The WHO three-step analgesic ladder**



* Source: *Cancer Pain Relief and Palliative Care* , Report of a WHO Expert Commitee, *Technical Report Series* No. 804, WHO, Geneva, 1990.

ANNEX 3

WHO List of Essential Drugs in Oncology

Antineoplastics, immunosuppressives and drugs used in palliative care

Immunosuppresive drugs

* azathioprine (2)	tablet, 50 mg powder for injection, 100 mg (as sodium salt) in vial
ciclosporin (2)[3]	capsule, 25 mg concentrate for injection 50 mg/ml in 1-ml ampoule

Cytotoxic drugs

asparaginase (2)	powder for injection 10 000 IU in vial
bleomycin (2)	powder for injection, 15 mg (as sulfate) in vial
calcium folinate (2)	tablet, 15 mg injection, 3 mg/ml in 10-ml ampoule
cisplatin (2)	powder for injection, 10 mg, 50 mg in vial
chlormethine (2)	powder for injection 10 mg (hydrochloride) in vial
cyclophosphamide (2)	tablet, 25 mg powder for injection, 500 mg in vial
cytarabine (2)	powder for injection, 500 mg in vial
dacarbazine (2)	powder for injection, 100 mg in vial
dactinomycin (2)	powder for injection, 500 ug in vial
* doxorubicin (2)	powder for injection, 10 mg, 50 mg (hydrochloride) in vial

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* Example of a therapeutic group. Various drugs can serve as alternatives.

[3] For organ transplantation.

etoposide (2)	capsule, 100 mg injection, 20mg/ml in 5-ml ampoule
fluorouracil (2)	injection, 50 mg/ml in 5-ml ampoule
levamisole (2)	tablet, 50 mg (as hydrochloride)
mercaptopurine (2)	tablet, 50 mg
methotrexate (2)	tablet, 2.5 mg (as sodium salt) powder for injection, 50 mg as sodium salt) in vial
procarbazine	capsule, 50 mg (as hydrochloride)
vinblastine (2)	powder for injection, 10 mg (sulfate) in vial
vincristine (2)	powder for injection, 1 mg, 5 mg (sulfate) in vial

Hormones and antihormones

prednisolone	tablet, 5 mg powder for injection, 20 mg, 25 mg, (as sodium phosphate or sodium succinate) invial
tamoxifen	tablet, 10 mg, 20 mg (as citrate)

Drugs used in palliative care

The essential drugs are those included in the WHO publication *Cancer Pain Relief and Palliative Care*, WHO, Geneva, 1990. They are listed in the relevant section of the Model List, according to their therapeutic use, e.g. analgesics.

ANNEX 4

Major References

1. *National Cancer Control Programmes: Policies and Managerial Guidelines.* Geneva, World Health Organization, 1993.
2. *Cancer Pain Relief and Palliative Care.* Report of a WHO Expert Committee. Geneva, World Health Organization, 1990 (WHO Technical Report Series, No. 804).
3. Report of the Intercountry Meeting on National Cancer Control Programmes, Alexandria, WHO Eastern Mediterranean Region, 1994 (unpublished document WHO-EM/CAN/79-E/L, 1994).

CANCER CONTROL
IN THE EASTERN MEDITERRANEAN REGION

Cancer is a major health problem in the developed world, but its increasing importance in the developing countries is not always recognized. This publication describes the situation of cancer in the Eastern Mediterranean Region and places it within a global context. It also offers proposals for the control of cancer that are specific for the Eastern Mediterranean countries and outlines the regional priorities and approaches for action. The Eastern Mediterranean Regional Plan of Action for cancer control provides a basis for the preparation of National Cancer Control Programmes (NCCPs) in individual countries, aiming to

- *PREVENT tomorrow's cancers*
- *DIAGNOSE cancers early*
- *PROVIDE curative therapy*
- *ENSURE freedom from suffering*
- *REACH all people in need*

This publication will be of interest to health professionals and all those who are concerned with the planning and management of cancer control programmes within the Eastern Mediterranean Region.

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