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Adolescence and Youth: Some Demographic and Epidemiological Aspects¹

Introduction

The recognition of adolescents and youth as an integral part of social and health programs is relatively new and represents a significant change in development policies and strategies. The inclusion of this group of the population in health plans has been an innovation, not only in the Americas but also throughout the world. That incorporation is becoming increasingly necessary because of the numerical and proportional growth of that group, the extension of the period of youth as education is prolonged, and the increasing capacity for self-expression of youth and adolescent groups.

The definition and conceptual approach of adolescence and of youth vary according to the objectives considered when the age limits of those periods are established (1,2). There appears to be general agreement that the term "adolescence" refers primarily to a biological process that affects the psychosocial area and that it constitutes a period during which the maturity of the personality, the sense of identity, the capacity for abstraction, and, as a result, harmonious adaptation to the family and the community environment begin. This stage extends from age 10 to age 20. The term

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youth, on the other hand, constitutes a fundamentally sociological category referring to the process whereby individuals begin to form part of society, with full rights and responsibilities. The most important variables for the chronological delimitation of youth are the opportunities for and duration of formal basic education and vocational preparation along with the possibilities of effective incorporation into the labor force. Youth, so defined, extends from age 15 to age 24; it includes the postpubertal stage of adolescence, followed by a gradual transition into adulthood. For the purposes of this paper the group 15 to 24 years old will be given special consideration.

Compared with other species, humans are slow in acquiring new behavioral patterns and require an estimated 20 years to mature. In general, the more advanced a society is from the technical point of view, the longer the period of the social maturation of its adolescents (3).

Demographic Aspects

In recent decades, the adolescent and youth population in the Region of the Americas has increased considerably both in absolute numbers and relative to other age groups. In Latin America and the Caribbean, where this relative increase has become one of the highest in the world, comparable only to that of the corresponding age group in Southern Asia, the group

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15 to 24 years of age has come to exceed 20% of the total population (4).

In 1960 the total youth population in Latin America and the Caribbean reached 38.5 million and about 73 million in 1980, almost doubling in 20 years. According to the United Nations projections, by the year 2000, there will be about 107 million young persons in the Region, approximately three times as many as in 1960. Between 1960 and 1980, the proportion of youth in the total population rose from 17.9 to 20.2%. Variations in the demographic trends indicate that by the year 2000 this percentage will fall slightly but will nevertheless remain at about 20%.

This phenomenon of relative growth of the youth population is associated with high rates of urbanization, even higher than those of the general population. In most countries of the Region, the internal migration of youth from rural to urban areas is intense and many assume that this tendency will be accentuated in the future. In addition, urban concentration will occur preferentially in the large metropolitan areas, with their marginal belts representing areas of risk for youth and adolescents, of contracting diseases and acquiring negative patterns of behavior (4).

Health Situation

Leading Causes of Death

Health in adolescence, which is one link in the life cycle, is strongly determined by development during prior stages. In addition, the process of maturation that youth experiences influences the new diseases they contract, and unresolved problems may have consequences in subsequent stages of life and may even jeopardize the future of their offspring (1).

Given the individual variations of pubertal changes, it is clear that youth and adolescents form a heterogeneous group from the point of view of health. In addition to this biological diversity, there are great social disparities in the Region, that, especially in those age groups, result in important variations in the epidemiological profile.

General mortality in adolescents is low, which often limits the assignment of priorities to this group. However, mortality rates by cause for this group show the influences of factors that require a clear intersectoral definition for its care.

The undoubted usefulness of analyses based on mortality by cause is often limited by the poor quality and reliability of death registration and medical certification. In addition, death, as the final recorded event, does not show the prevalence of diseases and abnormal patterns of behavior that affect the health of adolescents and the adults they will become. Therefore, the mor-

bidity studies being made in the various countries take on special importance, especially for youth and adolescents.

Table 1 shows the five leading causes of death for youths aged 15 to 24 years, by sex and subregion, and provides a general picture of the health problems of youth in the Americas.

Accidents are the leading cause of death for both sexes in the five subregions considered. The specific mortality rate is always much higher for males than for females; ranging from twice to as much as four times as high. Between 41 and 60% of all deaths in young males and between 16 and 48% in females are due to accidents (5).

The second leading cause of death for males is either homicide or suicide; for females it is heart disease or complications of pregnancy, except in North America where homicides are the second leading cause of death, even in females.

Complications of pregnancy are among the five leading causes of death for female adolescents in all the subregions of Latin America and the Caribbean; they rank second in Tropical South America and Continental Middle America, and fourth in the Caribbean and Temperate South America. This fact stands out as an important epidemiological difference between these countries and those of North America; it should be noted that in Continental Middle America and Tropical South America complications of pregnancy account for 10% or more of deaths in females in this age group.

The next leading causes of death for both sexes include the following in alternating sequence: heart disease, malignant neoplasms, influenza and pneumonia, enteritis, and tuberculosis. The last three causes should not appear in the mortality for this age group and their persistence among the five leading causes in some subregions points to problems derived from the socioeconomic level and inadequate coverage of health services.

Table 2 shows the mortality rates for all causes and by groups of causes, by sex, in some countries of the Americas, circa 1978. In all the countries the overall mortality rate for males is higher than that for females and in most of them it is at least twice as high. For males, the values range from 117.0 deaths per 100,000 inhabitants 15 to 24 years of age (in Uruguay) to 284.3 (in Guatemala), while for women the range goes from 53.1 (in Costa Rica) to 200.5 (in Guatemala).

Accidents are the leading cause of death for males in all the countries. They are also the main cause of death for women in 10 out of the 15 countries, while in four countries (Ecuador, Guatemala, Paraguay, and Peru) maternal causes rank first. Maternal causes, that is, complications of pregnancy, childbirth, and the puerperium have the widest range in this age group,

Table 1. Five leading causes of death in young people aged 15 to 24 years, with rates per 100,000 population and percentage of deaths, by sex and subregion of the Americas, circa 1978.

| Cause ^a | Men | | Women | | |
|--|-------|------|--|------|------|
| | Rate | % | Cause ^a | Rate | % |
| <i>Caribbean^b</i> | | | | | |
| Accidents | 65.2 | 45.8 | Accidents | 31.1 | 32.3 |
| Homicide, legal intervention, and war operations | 20.8 | 14.6 | Heart diseases | 7.2 | 7.5 |
| Heart diseases | 5.8 | 4.1 | Malignant neoplasms | 5.7 | 5.9 |
| Malignant neoplasms | 5.6 | 4.0 | Complications of pregnancy, childbirth, and the puerperium | 5.7 | 5.9 |
| Influenza and pneumonia | 3.9 | 2.7 | Homicide, legal intervention, and war operations | 3.3 | 3.5 |
| <i>Continental Middle America^c</i> | | | | | |
| Accidents | 109.5 | 47.6 | Accidents | 21.1 | 16.2 |
| Homicide, legal intervention, and war operations | 32.0 | 13.9 | Complications of pregnancy, childbirth, and the puerperium | 13.1 | 10.0 |
| Influenza and pneumonia | 9.0 | 3.9 | Heart diseases | 10.6 | 8.2 |
| Heart diseases | 9.0 | 3.9 | Influenza and pneumonia | 8.6 | 6.6 |
| Enteritis and other diarrheal diseases | 5.7 | 2.5 | Enteritis and other diarrheal diseases | 6.8 | 5.2 |
| <i>Temperate South America^d</i> | | | | | |
| Accidents | 71.1 | 50.6 | Accidents | 18.6 | 22.9 |
| Suicide | 9.4 | 6.7 | Heart diseases | 6.3 | 7.8 |
| Malignant neoplasms | 9.3 | 6.6 | Malignant neoplasms | 6.2 | 7.6 |
| Homicide, legal intervention, and war operations | 8.7 | 6.2 | Complications of pregnancy, childbirth, and the puerperium | 6.0 | 7.4 |
| Heart diseases | 6.9 | 4.9 | Suicide | 5.8 | 7.1 |
| <i>Tropical South America^e</i> | | | | | |
| Accidents | 74.7 | 40.8 | Accidents | 18.1 | 16.5 |
| Homicide, legal intervention, and war operations | 28.2 | 15.4 | Complications of pregnancy, childbirth, and the puerperium | 12.9 | 11.8 |
| Tuberculosis | 7.3 | 4.0 | Tuberculosis | 7.0 | 6.4 |
| Suicide | 6.8 | 3.7 | Heart diseases | 6.6 | 6.0 |
| Heart diseases | 6.7 | 3.6 | Malignant neoplasms | 5.5 | 5.1 |
| <i>North America^f</i> | | | | | |
| Accidents | 101.3 | 60.1 | Accidents | 28.1 | 47.8 |
| Suicide | 20.3 | 12.1 | Homicide, legal intervention, and war operations | 5.4 | 9.3 |
| Homicide, legal intervention, and war operations | 18.3 | 10.9 | Suicide | 4.7 | 8.1 |
| Malignant neoplasms | 7.5 | 4.5 | Malignant neoplasms | 4.7 | 8.0 |
| Heart diseases | 3.0 | 1.8 | Heart diseases | 2.0 | 3.4 |

Source: Office of Health Statistics, PAHO.

^aThe groups of causes are those of the *International Classification of Diseases*, 8th revision, and include the following codes: Enteritis and other diarrheal diseases, 008, 009; Tuberculosis, 010-019; Malignant neoplasms, 140-209; Heart diseases, 390-429; Influenza and pneumonia, 470-474, 480-486; Complications of pregnancy, childbirth, and the puerperium, 630-678; Accidents, E800-949, 980-989; Suicide, E950-E959; Homicide, legal intervention, and war operations, E960-E978.

^b*The Caribbean*: Antigua, Bahamas, Cayman Islands, Cuba, Dominica, Dominican Republic, Grenada, Guadeloupe, Haiti, Jamaica, Martinique, Montserrat, Netherlands Antilles, Puerto Rico, Saint Christopher and Nevis, Saint Vincent and the Grenadines, Saint Lucia, Trinidad and Tobago, Turks and Caicos Islands, the Virgin Islands (UK), and the Virgin Islands (USA).

^c*Continental Middle America*: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, and Panama.

^d*Temperate South America*: Argentina, Chile, Uruguay, and the Falkland Islands.

^e*Tropical South America*: Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, and Venezuela.

^f*North America*: Canada, United States of America, Bermuda, and Saint Pierre and Miquelon.

Table 2. Number of deaths in the population aged 15 to 24 years and mortality rates per 100,000 population, by groups of causes, by sex and by country, circa 1978.

| Country (year) | Sex | All causes | | Rate by group of causes ^a | | | | |
|---------------------------------|-----|------------|-------|--------------------------------------|----------------|-----------------|-----------|----------|
| | | No. | Rate | Malignant neoplasms | Heart diseases | Maternal causes | Accidents | Suicides |
| Argentina (1978) | M | 3,529 | 136.9 | 8.4 | 8.6 | — | 66.3 | 8.4 |
| | F | 1,929 | 83.7 | 6.0 | 7.9 | 6.5 | 17.5 | 6.9 |
| Chile (1979) | M | 1,763 | 153.1 | 11.1 | 4.0 | — | 85.2 | 11.0 |
| | F | 878 | 77.7 | 6.2 | 3.7 | 5.5 | 20.1 | 3.5 |
| Colombia (1977) | M | 5,209 | 188.1 | 6.7 | 7.2 | — | 66.2 | 6.9 |
| | F | 2,850 | 105.8 | 6.4 | 7.1 | 13.1 | 19.1 | 3.9 |
| Costa Rica (1979) | M | 326 | 127.9 | 9.8 | 6.3 | — | 71.8 | 5.5 |
| | F | 132 | 53.1 | 5.2 | 5.2 | 3.6 | 12.1 | 2.0 |
| Cuba (1978) | M | 1,060 | 130.5 | 7.6 | 4.8 | — | 89.3 | 14.7 |
| | F | 876 | 111.7 | 6.8 | 8.0 | 2.7 | 67.9 | 37.6 |
| Ecuador (1978) | M | 1,650 | 214.1 | 6.1 | 12.5 | — | 87.5 | 7.0 |
| | F | 1,276 | 169.4 | 4.4 | 11.9 | 22.2 | 22.0 | 10.2 |
| Guatemala (1978) | M | 1,962 | 284.3 | 5.4 | 7.1 | — | 127.2 | ... |
| | F | 1,333 | 200.5 | 3.8 | 8.1 | 15.9 | 15.6 | ... |
| Mexico (1976) | M | 14,369 | 232.6 | 5.5 | 9.4 | — | 114.6 | 4.6 |
| | F | 7,627 | 128.1 | 4.5 | 11.3 | 13.1 | 23.0 | 1.8 |
| Panama (1978) | M | 218 | 126.7 | 2.3 | 1.7 | — | 81.4 | 2.9 |
| | F | 133 | 76.4 | 6.3 | 3.4 | 6.9 | 15.5 | 0.6 |
| Paraguay ^b (1978) | M | 311 | 198.1 | 10.2 | 6.4 | — | 74.5 | 6.4 |
| | F | 249 | 159.6 | 7.7 | 12.8 | 31.4 | 16.0 | 4.5 |
| Peru (1978) | M | 1,961 | 119.6 | 4.3 | 4.3 | — | 32.5 | 2.9 |
| | F | 1,678 | 103.8 | 4.5 | 5.1 | 11.3 | 9.9 | 2.8 |
| Trinidad and Tobago (1977) | M | 179 | 138.9 | 8.5 | 3.9 | — | 69.1 | 16.3 |
| | F | 88 | 73.4 | 8.3 | 4.2 | 5.0 | 9.2 | 10.0 |
| United States of America (1978) | M | 36,017 | 169.4 | 7.5 | 3.2 | — | 101.2 | 19.5 |
| | F | 12,483 | 59.6 | 4.8 | 2.1 | 0.6 | 28.4 | 4.6 |
| Uruguay (1978) | M | 278 | 117.0 | 9.7 | 4.6 | — | 51.7 | 12.2 |
| | F | 164 | 71.6 | 7.4 | 3.1 | 3.9 | 22.3 | 6.5 |
| Venezuela (1978) | M | 3,211 | 229.2 | 7.7 | 5.3 | — | 132.5 | 11.3 |
| | F | 1,194 | 85.6 | 5.5 | 3.6 | 7.7 | 22.9 | 3.4 |

Source: Office of Health Statistics, PAHO.

^aThe groups of causes are those of the *International Classification of Diseases*, 8th revision, and include the following codes: Malignant neoplasms, 140-208; Heart diseases, 390-429; Causes of maternal mortality, 630-678; Accidents, E800-E949, E980-E989; Suicide, E950-E959.

^bReporting area.

... Data not available.

from 0.6 per 100,000 women 15 to 24 years of age in the United States of America to 31.4 in Paraguay, meaning that the risk of maternal death for an adolescent in Paraguay is 52 times higher than in the United States.

Although the mortality profile for this age group tends to show smaller differences between the developed and the developing countries than for other age groups, there still are countries in Latin America and the Caribbean in which the youth mortality rates for infectious and parasitic diseases are in the two digit range. Therefore, the most recent mortality figures for this supposedly more resistant age group reveal the influence of inequalities prevailing in the different societies. More profound studies, including data on

morbidity, on social variables, and on those relating to health services will make it possible to define and use more appropriate strategies for attacking the problems of adolescents and youth.

Trends of Mortality from Certain Causes

Examination of the five leading causes of death for youth aged 15 to 24 years shows that accidents and violence are of enormous importance in the two sexes; for females complications of pregnancy, childbirth, and the puerperium are added. Accordingly, a brief analysis of the trends of mortality from these causes in recent years follows.

Accidents. These are the leading cause of death for older children, adolescents, and youths. In some countries more than 50% of the deaths in those groups are due to accidents. Their impact, however, goes beyond lethal accidents, since it is estimated that for every person who dies there are 15 seriously injured and 30 to 40 slightly injured (2). This gives an idea of the losses and residual incapacity that accidents produce, and the consequent effort that the victims' rehabilitation entails. Among accidents as a whole, traffic accidents cause the largest number of deaths in adolescents (6), while household accidents have a greater impact on lower age groups (7).

Unpublished data available on accidents in some countries of the Americas for the period from 1968 to 1982 show that in Venezuela death rates for males increased to a considerable level (141.3 in 1980). Death rates for women also increased but less markedly so, and they remain at a lower level than those for males (20.9 in 1980). In contrast, in the United States male death rates due to accidents showed a decrease up until the mid 1970s and then increased, while women's death rates stayed relatively stable. In Mexico death rates for both sexes have increased.

Suicide. Studies on suicide in youths have revealed that the motives and immediate causes of this act of self-destruction are related to personal problems such as failed love affairs or failure at school, difficulties in relations with parents, and pregnancies of unmarried mothers. Alcoholism and, especially, experiences with drugs can contribute directly or indirectly to suicide (8).

Unpublished data on suicide in some countries of the Region, by sex, show that in Canada there was an important increase in male death rates from 11.7 in 1968 to 25.5 in 1982, while women's death rates varied from 3.2 to 5.9. In Cuba death rates for women increased from 24.4 in 1968 to 37.6 in 1978, more than double the males' for the whole period and the highest in the Americas. In other countries, such as Peru, it appears that suicide is not a serious health problem for this age group.

On analyzing the situation, it is important to bear in mind that underregistration of deaths by suicide is severe in Latin America. Even in countries with a long tradition in vital statistics, a certain degree of omission in the data on suicide can be noted. The reasons for this underregistration vary from one country to another and depend not only on the methods used for certifying the cause of death (physician or other authority), but also on the registration and coding procedures used and the cultural attitudes of the population. The stigma attached to suicide in some societies, the influence of religious beliefs that condemn this act, and the legislation in force in some countries may be additional reasons that explain underregistration.

Causes of Maternal Mortality. The high rates of mortality from maternal causes in adolescents and young women indicate that special attention must be given to their health needs in relation to the reproductive process, including family planning.

According to available data, mortality rates for 15- to 24-year-old women due to complications of pregnancy, childbirth, and the puerperium declined in the Region between 1968 and 1982. Nevertheless, the rates in Latin American countries are much higher than those in Canada and the United States. It is noteworthy that in Ecuador and Colombia the rapid decrease in the rates in the 1960s was replaced in the 1970s by a much slower decline and the persistence of relatively high rates. In Chile the rates fell sharply throughout the period, whereas in Venezuela, although there was a decline in those years, it was much less rapid.

General Morbidity

The complexity of the changes adolescents and youth undergo and the importance of the problems that affect them make knowledge about them and their care increasingly essential. Adolescence is a crucial stage for the formation of behavioral habits that influence the health of the individual and of others and that are related to the development of socialization models, sexual life, the use of various drugs—including alcohol and cigarettes—and, in some developed countries, driving automobiles or other vehicles at high speeds (9). The habits acquired by adolescents and youths can be of decisive importance in their future life and enable them to realize, or prevent them from realizing, their full potential. These considerations are especially important since the habits acquired during adolescence and youth can be influenced if adequate strategies are used.

With regard to diseases connected with the reproductive process, since the 1960s there has been a substantial increase in the incidence of sexually transmitted diseases, especially gonorrhea, which is the commonest notifiable infectious disease of adolescence. In the United States the incidence of this disease doubled in male adolescents between 1960 and 1974 and increased fourfold in females of the same age. Other venereal diseases that are frequent in adolescence are chlamidia infections, syphilis, and genital herpes. Gonorrhea—and its most frequent complication, acute pelvic inflammatory disease—chlamidia infections, and genital herpes have reached epidemic proportions in many countries in the Region.

Venereal diseases in promiscuous female adolescents may be an indication of an important underlying disease, for example, serious depression. They may

give rise to many different clinical pictures and in some cases lead to infertility.

Mental and psychosocial disorders comprise a very wide spectrum of conditions in adolescents, ranging from relatively simple learning problems to very serious psychiatric afflictions, such as deep depression that can lead to attempted suicide.

Other health problems that occur in adolescents include nutritional disorders (iron-deficiency anemia, malnutrition, obesity, anorexia nervosa), metabolic and endocrine affections (goiter and diabetes), various skin diseases (especially acne), dental problems, and chronic diseases of various types such as asthma, epilepsy, kidney infections, and musculoskeletal and neurosensory problems (10).

Finally, it must also be borne in mind that adolescents do not grow in a social vacuum; rather at that critical stage in which values and behavioral patterns are formed, they respond creatively to the family, cultural, political, and socioeconomic influences of their time. The effects of these influences should not be understated; especially at present and in some subregions of the Americas where, regrettably, large segments of the population are still adversely affected by poverty and social conflict.

Risk-generating Behavior

Abuse of alcohol, cigarettes, and drugs is not a new phenomenon but it has increased markedly in recent years. Consumption of these substances begins at ever younger ages, and in female adolescents it is more frequent than in the past. A study conducted in 1984 by the State Division on Drug Abuse of the State of New York found that 31% of students had tried drugs before entering the seventh grade. In the 1970s, some new trends in drug abuse were noted, including the geographical spread of this habit, the use of drugs causing dependence, not only by the youth of minority and low-income groups but also by middle- and upper-class adolescents, and the consumption of multiple drugs by the same person, the result of which is the potentiation of the effects and a consequent increase in dangerousness.

The dangers of excessive alcohol consumption have already been clearly demonstrated. Instead of reducing the consumption of other drugs, it appears to increase the possibilities thereof. Moreover, the problems caused by alcohol abuse go beyond those who consume it. It has been repeatedly demonstrated that between 45 and 60% of all fatal automobile accidents caused by adolescent drivers are connected with their abuse of alcohol. Another example is its harmful effect on the children of alcoholic female adolescents, who can present the "alcoholic embryopathy syndrome," char-

acterized by low birth weight, retardation of growth, microcephaly, and other physical and mental disorders.

Tobacco smoking has many of the same causal characteristics and dangers as alcohol and drug abuse. It has been widely demonstrated that the smoking habit substantially increases the risk of contracting chronic bronchitis, emphysema, heart disease, and lung cancer. Furthermore, this habit in pregnant women reduces the birth weight of their children as well as their resistance to disease.

Pregnancy in adolescents is one of the most important medical concerns arising from the sexual behavior of youth. As a result of the earlier age at which sexual relations are begun, without proper use of contraceptives, adolescent pregnancies have increased notably in recent times. In the United States the number of pregnant teenagers between 15 and 19 years of age is greater than one million each year. To this group must be added about 30,000 pregnant teenagers under 15 years of age each year. Of that million pregnancies, approximately 600,000 end in birth, about 300,000 in induced abortion, and the remainder in miscarriage. In several countries in Latin America and the Caribbean the proportion of pregnancies in mothers under 20 years of age exceeds 30% of the total.

Various comparative studies show a relation between poverty and early pregnancy. Poverty is seven times more frequent among adolescents that have a child than among other adolescents. The frequency of divorce or separation from their partners is three times greater for adolescent mothers, and it is estimated that their total lifetime wages will be considerably lower than those of other adolescents.

In the children of adolescents, prematurity, low birth weight, and perinatal and neonatal mortality are more frequent than in the children of adult women. Repeated pregnancies in adolescents show predictive characteristics that can be of great importance in developing strategies for the effective prevention of these situations. It has been demonstrated that pregnancies tend to be repeated more frequently among those adolescents who do not return to school or to work after they have had a child; whether these young women can do so depends in large measure on the assistance they receive from their partners. In this regard it should be pointed out that the adolescent father has been traditionally neglected by health services, although having a child may have as devastating effects on him as on the child's mother, both from the psychological point of view and with respect to his employment and educational possibilities.

Multidimensional Approach

An examination of the causes of death and the pat-

terms of morbidity in adolescence and youth reveals the complexity of health care needs in this crucial stage of human development and point to the urgent necessity for dynamic, multiple approaches for solving the problems that affect this population group. Studies aimed at generating knowledge, not only about the physical and psychological pathology of young persons but also about the demographic, social, and occupational factors that affect their health are therefore of great importance.

The multidimensional nature of the problems of youth calls for intersectoral coordination that allows development of the capacity to meet the needs of adolescents in an integrated manner.

References

- (1) Cusminsky, M., and E. N. Suárez Ojeda. Características de la morbimortalidad en el adolescente y el joven. In: *Condiciones de salud del niño en las Américas*. Washington, D.C., Pan American Health Organization, 1979 (Scientific Publication No. 381), pp. 36-56.
- (2) Rosselot, J. La salud del adolescente y el joven en América Latina y el Caribe. *Bol Of Sanit Panam* 83(4):295-303, 1977.
- (3) May, A. R., J. H. Kahn, and B. Cronholm. *Mental Health*

of Adolescents and Young Persons. Report on a Technical Conference. Geneva, World Health Organization, 1971 (Public Health Papers No. 41).

(4) Economic Commission for Latin America (CEPAL). *Situación y perspectivas de la juventud en América Latina*. San José, Costa Rica, 1983 (Publicación E/CEPAL/Conferencia 75/L.2).

(5) Alfaro, A. C., and C. Díaz Coller. Los accidentes de tránsito: creciente problema para la salud pública. *Bol Of Sanit Panam* 83(4):310-318, 1977.

(6) Norman, L. G. *Road Traffic Accidents: Epidemiology and Prevention*. Geneva, World Health Organization, 1962 (Public Health Papers No. 12).

(7) Backett, E. M. *Domestic Accidents*. Geneva, World Health Organization, 1965 (Public Health Papers No. 26).

(8) World Health Organization. *Suicide and Attempted Suicide*. Geneva, 1974 (Public Health Papers No. 58).

(9) Cattell, R. B. *Personality*. New York, McGraw-Hill, 1950.

(10) Smith, M. S. *Chronic Disorders in Adolescence*. Littleton, Massachusetts, John Wright-PSG, 1983.

(Source: Maternal and Child Health Program and Office of Health Statistics, PAHO; Dr. Daniel Korin, Director, Department of Outpatient Care, Woodhull Medical and Mental Health Center, Brooklyn, New York, U.S.A., and Dr. Marcos Cusminsky, Director, Hospital Zonal Especializado Dr. Noel H. Sbarra, La Plata, Buenos Aires, Argentina.)

Cancer Registries

A cancer registry is a system for gathering, analyzing, and using information on certain characteristics of malignant tumors in a given geographical area. It is also referred to as a tumor registry when it includes some benign tumors, in addition to the malignant neoplasms. This article responds to the growing interest shown by PAHO's member countries in these registries and provides information on pertinent methodological aspects.

There are various kinds of cancer registries; the most accepted classification is the one based on the population covered and the period of time that the registry functions. Among the registries that could be considered permanent or long-running, there are two types: population-based registries (related to a general population) and hospital or institutional registries. Periodic or cross-sectional surveys, which provide information on the cases of the disease at a given time, are of the nonpermanent type.

Epidemiologically, the permanent, population-based registries are the most useful, not only because they make it possible to determine cancer's relative status, but also because they facilitate the surveillance and control of malignant forms, the detection of carcinogens, and the search for causal factors. They are also

called incidence registries because they include information on the number of newly diagnosed cases in the population. Hospital cancer registries, on the other hand, are mostly used in clinical medicine and in the study of the natural history and treatment of each type of tumor.

Population-based registries are normally organized by city or province, rarely by country, due to reasons that will be explained further on. The basic prerequisites for establishing a population-based cancer registry are:

1) *Accessibility of the Population to Acceptable Medical Services*

An appropriate level of technology is indispensable for reliable diagnosis. This aspect is frequently overlooked and cancer registries with national coverage are proposed without taking into account the fact that, in many Latin American countries, there are population groups that do not have access to medical care that is competent enough to ensure the reliability of the diagnoses required for a registry.

2) *Existence of Medical and Laboratory Record Systems*

Another important condition that must be taken into

consideration when planning a national cancer registry is the availability of a system for compiling data from clinical histories and various laboratories at public and private institutions (Figure 1). Since the data collected on cancer must be as complete as possible, the system should be structured so that all diagnosed cases are included in the registry. The organization of such a system is one of the major obstacles to national registries, since it depends on an infrastructure that, in turn, depends on financing to ensure its long-term operation.

3) *Knowledge of the Population's Demographic Characteristics*

The availability of demographic data on the reference population is another basic necessity. Otherwise, the registry cannot be used to calculate true incidence rates by age group, sex, place of birth, origin, or other characteristics. One of the main objectives of a cancer registry is precisely to increase knowledge on the characteristics of the affected population and promote research on the causes of differences in incidence. Therefore, vital statistics systems should be improved before attempting to set up a population-based cancer registry.

4) *Possibility of Implementing a Unique Numerical Identification System*

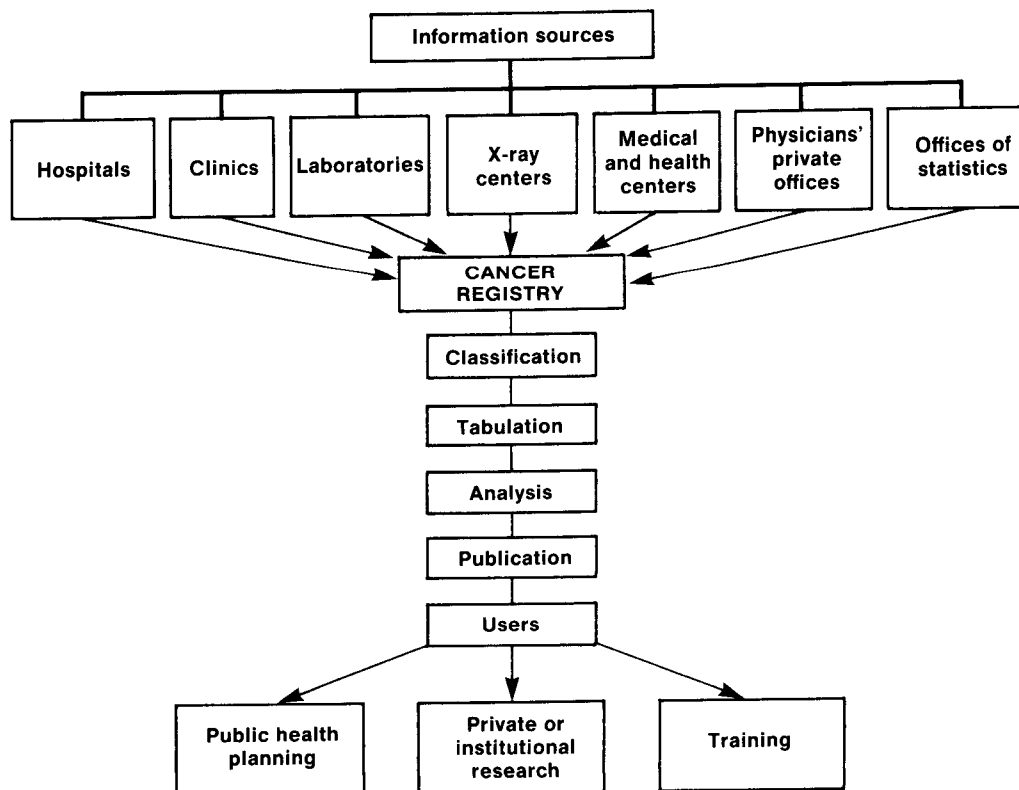
It is advisable to have a unique numerical system for identification of individuals (national identification

number) to facilitate cross-registration and prevent duplications.

In developing countries, it is generally difficult to achieve country-wide compliance with these four conditions. Medical care is provided mainly in urban areas, where most of the medical and technological facilities are concentrated. Consequently, incidence rates calculated on the basis of a national registry would have a high level of urban population in the numerator (i.e. cases diagnosed) and, when related to the denominator (the total, including the rural population), this would produce a bias in the information, and in the interpretation and analysis as well. It is preferable, therefore, to define more limited geographical areas, where a population-based cancer registry could be organized and maintained effectively. As stated by Freni, "a scrupulous evaluation" of the conditions prevailing in these countries must be made before proposing national cancer registries.

The population-based or incidence cancer registry is of untold value in programming health services and public health campaigns, as well as in promoting research and improving training on cancer. The information must, therefore, be of the highest quality. Furthermore, it is desirable that a group of researchers, teachers, and epidemiologists in the cancer field be linked to the system and involved in using the registry. Their collaboration would ensure the quality of the

Figure 1. Circulation of information from cancer registries.



registry and of the analysis of information. Thus, the registries would serve as catalysts to promote epidemiological and clinical research, in addition to their use in health planning. Where it is not possible to have such a qualified group, population-based cancer registries would be of very limited benefit and would not justify the costs and efforts involved in organizing them.

The other type of major permanent cancer registry is the hospital registry, which provides information on patients cared for at a given institution. These registries include, for each patient, data on the progress of the disease, recurrences, metastases, remissions, cure, or death. They are extremely useful because they make it possible to complete the picture of hospital morbidity, carry out survival studies, evaluate treatment methods and the quality of oncological care, and, above all, properly plan the necessary resources (staff, equipment, drugs) for cancer patient care. Hospital registries also serve to promote better training of health personnel as well as epidemiological and clinical research.

The prerequisites for setting up hospital-type registries are similar to those for population-based registries: levels of health care quality and scientific and technical competency adequate to ensure the reliability of the recorded diagnostic information; good clinical histories and registration forms for laboratory examinations; and a statistical infrastructure with sufficient staff and mechanical equipment to manage and process the data. The information that can be obtained from hospital cancer registries—provided it is complete, of high quality, and covers a broad sector of the population—makes it possible to increase knowledge on the local frequency of cancer and, in some cases, to make projections for the entire country by consolidating data from various hospital registries. However, registries should not be set up at all hospitals for this purpose. For a registration system to be justified and fulfill the important function of promoting clinical research and improving health care, physicians, nurses, and other pertinent personnel must be able to use the information properly. They must analyze the data collected in the cancer registry and use them in research on areas such as treatment, the frequency of different types of neoplasms, and survival. Hospital registries play a very important role when used as the basis for medical care, that is, when they are incorporated into the practice of oncological medicine and used in decisions on procedures, treatments, and follow-up of cancer patients. It is important that the staff managing the data in the hospital registries include university professors who can then pass on the information to the students and faculty of their institutions.

Information on cancer can also be obtained from mortality statistics. The quantity and quality of infor-

mation on mortality in a country are basic to advance the knowledge of cancer. It would seem then, that these two aspects should be coordinated and that, when developing information on cancer, consideration should also be given to mortality statistics, since they do not constitute a phenomenon separate from the process of improving general health information. It is recommended that, prior to proposing national cancer registries in any country, medical certification be achieved for all deaths and a reliable process set up for compiling data on mortality.

In many countries, national cancer registries do not contribute to improving the information required by specific control programs. This is a major drawback, especially in relation to cancer of the uterine cervix. The cancer registries currently in existence in several countries do not collect the information required for monitoring and evaluating the control of this kind of cancer, which is a priority health problem. One of the major difficulties is the insufficient registration of cytologies, since cancer registries are normally kept separate from the diagnostic cytological registries that are needed for evaluating activities for the control of cancer of the uterine cervix. As a result, when analyzing recorded data, it is essential to keep in mind the control programs and types of cancer that they cover.

Furthermore, efforts must be made to ensure that the proposed registries—whether population or institution-based, permanent or by periodic surveys—comply with all aspects of the policy for cancer treatment and the country's pertinent institutions. It is also essential to involve in the use of the sources of information on cancer, the trainers of health workers and the planners of health services.

Bibliography

Freni, S. C. The founding of a cancer registry in a developing country. *J Trop Med Hyg* 86:171-177, 1983.

MacLennan, R., C. S. Muir, R. Steinitz, and A. Winkler, eds. *Cancer Registration and Its Techniques*. Lyon, World Health Organization, International Agency for Research on Cancer (IARC), and International Association of Cancer Registries, 1978 (IARC Scientific Publication No. 21).

Miller, D. G. What is early diagnosis doing? *Cancer* 37:426-432, 1976.

Pan American Health Organization. *Manual para la estandarización de registros de cáncer de hospital*. Washington, D.C., 1977 (Scientific Publication No. 349).

Pan American Health Organization. *Seminario sobre Registros de Cáncer en América Latina*. Washington, D.C., 1970 (Scientific Publication No. 215).

(Source: Adult Health Program, PAHO, and Alba Lucía Maya, Coordinator of the Cancer Registry, Northshore Medical Center, Community Cancer Center, Miami, Florida, U.S.A.)

Diseases Subject to the International Health Regulations

**Cholera, yellow fever, and plague cases and deaths reported in the
Region of the Americas up to 31 December 1985.**

| Country and administrative subdivision | Cholera Cases | Yellow fever | | Plague Cases |
|---|------------------|--------------|--------|-----------------|
| | | Cases | Deaths | |
| BOLIVIA | — | 50 | 33 | — |
| Chuquisaca | — | 1 | — | — |
| Cochabamba | — | 2 | 2 | — |
| La Paz | — | 47 | 31 | — |
| BRAZIL | — | 7 | 5 | 41 |
| Bahía | — | — | — | 13 |
| Ceará | — | — | — | 28 |
| Mato Grosso | — | 5 | 3 | — |
| Pará | — | 1 | 1 | — |
| Rondônia | — | 1 | 1 | — |
| COLOMBIA | — | 4 | 4 | — |
| Antioquia | — | 1 | 1 | — |
| Guaviare | — | 1 | 1 | — |
| Meta | — | 2 | 2 | — |
| ECUADOR | — | 1 | — | 3 |
| Loja | — | — | — | 3 |
| Pastaza | — | 1 | — | — |
| PERU | — | 51 | 25 | 21 |
| Amazonas | — | 1 | 1 | — |
| Cajamarca | — | — | — | 10 |
| Cuzco | — | 11 | 9 | — |
| Huánuco | — | 6 | 2 | — |
| Junín | — | 10 | 8 | — |
| Madre de Dios | — | 2 | 1 | — |
| Piura | — | — | — | 11 |
| San Martín | — | 6 | 4 | — |
| ... ^a | — | 15 | — | — |
| UNITED STATES OF AMERICA | 4 | — | — | 17 |
| Colorado | — | — | — | 3 |
| Guam | 3 | — | — | — |
| Missouri | 1 ^b | — | — | — |
| New Mexico | — | — | — | 14 |

^aUnknown locality.

^bLaboratory case.

The National Tumor Registry in Costa Rica

Introduction

Cancer is a serious health problem in many countries and indications are that the situation will become even more serious in the future. Its relative importance increases as control of infectious diseases and malnutri-

tion becomes more effective; its absolute importance varies according to current trends in such important factors as a) increased life expectancy and changes in the demographic structure of the population, with more persons surviving to reach ages where the risk of cancer is greater; b) new trends in life-style and human be-

havior that might be associated with greater risk of acquiring certain types of cancer and lower risk of acquiring others; and c) changes in the environment as a result of industrialization and urbanization that may tend to increase the risk of cancer.¹

The formulation and reformulation of national cancer control programs require correct information on the size of the problem as well as on the monitoring and evaluation of actions. The basic objective of this article is to provide information on the National Tumor Registry of Costa Rica as a specific source of information on cancer. It is also aimed at making the health workers directly or indirectly connected with the Registry—whether as data producers, users, or technical and administrative support—aware of their important role in ensuring that health statistics, in general, and those from the Registry, in particular, provide more reliable, complete, and timely information.

This description includes aspects of the legal basis of the National Tumor Registry and the data collection procedures that are used to ensure that the information is of the highest quality possible. To demonstrate the potential of this source of information, some statistics, taken from the Registry, on the incidence of cancer in Costa Rica in recent years are also presented.

The National Tumor Registry

Legal Basis

The reporting of cancer was made mandatory in Costa Rica by Executive Decree No. 6584 SPPS of 6 December 1976. This decree also allowed for the establishment of the National Tumor Registry which began collecting data in March 1977.

Objectives

The objectives of the National Cancer Registry, as stated in the decree, lie in the compilation of data on all cases of malignant neoplasms diagnosed within the country; they include finding a) the incidence and prevalence of cancer by anatomical site, and the sex, age, occupation, and geographical area of the patient; b) the distribution and quality of medical care provided to cancer patients; and c) any other related information.

Sources of Data

The sources that provide information on detected cases of cancer in Costa Rica are the tumor report

sheets (from hospital discharges), death certificates, and reports from biopsies and autopsies.

A *tumor report sheet* is prepared for each patient discharged from any hospital in the country with the diagnosis of malignant neoplasm. This form includes the following data taken from the patient's file:

1. Institution, location
2. Clinical history number, file number
3. Full name, national identity number
4. Sex and marital status
5. Date and place of birth
6. Age
7. Occupation
8. Home address
9. Final diagnosis
10. Basis for diagnosis
11. Histological diagnosis
12. Whether there was a positive diagnosis of cancer prior to this hospitalization, and if so, on what date?

Other Procedures Used

In addition to the data collection forms mentioned above, the National Tumor Registry uses the following:

Patient Index. This includes the patient's full name, national identity number, and Registry file number. It allows the exact identification of each cancer patient.

Follow-up Card. This shows the full name, national identity number, and some personal characteristics of the patient. It also includes details on care provided and the progress of the disease, which make it possible to measure survival. These cards constitute a permanent registry for all reported cases of cancer.

Case Registry. This includes each type of cancer that is diagnosed, according to site, along with the patient's file number and some characteristics of the person and care received. These records allow establishment of the sites of the cancer in newly detected cases and hence measurement of incidence.

Reliability of Information in the National Tumor Registry

Table 1 shows the new cases of cancer reported annually to the National Tumor Registry from 1977 to 1983. The information for 1977, 1978, and 1979 should be used with caution since some health establishments had not yet been incorporated into the system and procedures for collection and quality control had not been definitively established. The regularity observable in the figures from 1980 on and the cross-checks available for obtaining information ensure good coverage and quality of the results.

¹World Health Organization. *Cancer Statistics*. Geneva, 1979 (Technical Report Series No. 632).

Table 1. New cases of cancer reported annually to the National Tumor Registry in Costa Rica, 1977 to 1983.

| Year | Number of cases |
|------|-----------------|
| 1977 | 1,653 |
| 1978 | 1,934 |
| 1979 | 2,882 |
| 1980 | 3,588 |
| 1981 | 3,626 |
| 1982 | 3,645 |
| 1983 | 3,681 |

Source: National Tumor Registry, Department of Statistics, Ministry of Health, Costa Rica.

Type of Information Available

Table 2 shows the new cases (incidence) of malignant neoplasms reported annually to the National Tumor Registry from 1977 to 1983, according to anatomical site. The figures indicate that the six site classifications most frequently reported in 1983 were: skin (not including malignant melanoma and the genital organs), 707 new cases; stomach, 560; uterine cervix, 529; female breast, 245; prostate, and lymphatic tissue and hematopoietic organs, 167 each. If the primary sites of unspecified cancer were ranked as a separate category, they would be in eighth place, with 74 new cases.

Table 2. New cases of malignant neoplasms reported annually to the National Tumor Registry in Costa Rica, 1977 to 1983, by site.

| Neoplasm sites and classifications ^a | Number of cases | | | | | | |
|---|-----------------|-------|-------------------|-------|-------|-------|-------|
| | 1977 | 1978 | 1979 ^b | 1980 | 1981 | 1982 | 1983 |
| Malignant neoplasm of: | | | | | | | |
| ● Lip, oral cavity, and pharynx (140-149) | 42 | 44 | 66 | 67 | 80 | 72 | 85 |
| ● Stomach (151) | 279 | 401 | 510 | 603 | 496 | 513 | 560 |
| ● Colon; rectum, rectosigmoid junction, and anus (153, 154) | 47 | 81 | 110 | 151 | 123 | 142 | 130 |
| ● Liver and intrahepatic bile ducts; gallbladder and extrahepatic bile ducts (155, 156) | 39 | 61 | 98 | 106 | 114 | 100 | 120 |
| ● Pancreas (157) | 23 | 30 | 59 | 56 | 61 | 72 | 70 |
| ● Esophagus; small intestine, including duodenum; retroperitoneum and peritoneum; other and ill-defined sites within the digestive organs and peritoneum (150, 152, 158, 159) | 42 | 58 | 64 | 66 | 67 | 66 | 93 |
| ● Trachea, bronchus, and lung (162) | 71 | 61 | 106 | 162 | 153 | 142 | 150 |
| ● Nasal cavities, middle ear, and accessory sinuses; larynx; pleura; thymus, heart, and mediastinum (160, 161, 163, 164) | 31 | 31 | 46 | 56 | 56 | 52 | 57 |
| ● Other of skin (not including malignant melanoma and genital organs) (173) | 94 | 95 | 220 | 523 | 588 | 610 | 707 |
| ● Female breast (174) | 129 | 142 | 204 | 238 | 216 | 231 | 245 |
| ● Bone and articular cartilage; connective and other soft tissue; male breast (170, 171, 175) | 31 | 28 | 37 | 55 | 49 | 49 | 52 |
| ● Cervix uteri (180) | 393 | 389 | 598 | 676 | 723 | 623 | 529 |
| ● Uterus, part unspecified; placenta; body of uterus; ovary and other uterine adnexa; other and unspecified female genital organs (179, 181-184) | 54 | 75 | 108 | 103 | 135 | 112 | 98 |
| ● Prostate (185) | 66 | 109 | 122 | 137 | 159 | 159 | 167 |
| ● Bladder (188) | 40 | 37 | 67 | 58 | 60 | 62 | 71 |
| ● Testis; penis and other male genital organs; kidney and other and unspecified urinary organs (186, 187, 189) | 29 | 32 | 54 | 65 | 73 | 67 | 79 |
| ● Eye; brain; other and unspecified parts of nervous system; thyroid gland; other endocrine glands and related structures; other and ill-defined sites (190-195) | 62 | 55 | 100 | 114 | 114 | 152 | 113 |
| ● Lymph nodes, secondary and unspecified (196) | 65 | 75 | 101 | 122 | 98 | 113 | 114 |
| ● Lymphatic and hematopoietic tissue (200-208) | 105 | 106 | 147 | 148 | 177 | 191 | 167 |
| ● Site without specification (199) | 11 | 24 | 65 | 82 | 84 | 117 | 74 |
| Total | 1,653 | 1,934 | 2,882 | 3,588 | 3,626 | 3,645 | 3,681 |

Source: National Tumor Registry, Department of Statistics, Ministry of Health, Costa Rica.

^aNomenclature and codification from the *International Classification of Diseases*, 9th Revision, 1975.

^bAs of 1979, biopsies and autopsies are included and reports are received from all hospitals.

Publications of the National Tumor Registry

The publications of the National Tumor Registry include reports on the newly notified cases of malignant neoplasms, by anatomical site, the age and sex of the patient, and the reporting institution. This information is supplemented with statistics on mortality from this same cause.

Observations

In 1970, malignant neoplasms were the fourth most common cause of death in Costa Rica. Expressed as a percentage of total deaths, they accounted for 9.7%, at a rate of 64.9 deaths per 100,000 inhabitants. In 1983, they rose to be the second most common cause with a relative share of 19.7%; the mortality rate from cancer rose to 76.0 per 100,000. In those two years, the greatest number of deaths was caused by cancer of the stomach (approximately 30%) and the second most common cause was cancer of the trachea, bronchus, and lung. It should be pointed out that if the unspecified cancer diagnoses were ranked as a separate category, the corresponding deaths from malignant neoplasms would have been the second most common cause in 1970 and the fourth most common in 1983.

The change in the level and structure of morbidity and mortality in Costa Rica between 1970 and 1983 supports the view that the policies for prevention and the extension of coverage of services—which have contributed to substantially improving some aspects of the population's health—should be actively adapted to new problems. In order to prevent and control some of the diseases that are the most common causes of mortality and morbidity, advanced technology is required; however, the country is not able to provide this to the general population. Instead, health authorities are seeking to design a health care model

based on the risk approach in order to distribute existing resources more effectively.

Information that is more specific and timely is needed for the risk approach to be properly applied. Furthermore, its reliability and coverage should be improved. This means that administrative support must be more effective with respect to the availability of forms for registration, electronic data processing, and the timeliness of printing publications.

Specification of the information is required not only from the territorial standpoint (from smaller, defined geographical areas), but also from the standpoint of medical diagnoses. In 1983 5% of the diagnoses of malignant neoplasms indicated as cause of death were unspecified in regard to site and 2% of the new cases of cancer detected in that same year were registered with the primary site unspecified.

Mortality statistics have been the traditional source of information for guiding health policies. Nevertheless, it is increasingly necessary to supplement them with information on morbidity in order to include those who survive. Hence, and in view of the requirements of the national policies, plans, and programs, it is advisable to consider the establishment or reformulation of disease registries that, like the National Tumor Registry, would provide more detailed information for the control and follow-up of cases as well as the supervision and evaluation of programs.

The National Tumor Registry has already achieved an acceptable level of consolidation and major research has been carried out based on the information it has provided. The development of this line of use will make it possible to initiate the organization of a future center for documentation on cancer research in Costa Rica.

(Source: Damaris G. de Bermúdez, Department of Statistics, Ministry of Health, Costa Rica.)

Information on Cancer in Brazil

Brazil has several institutions that produce information on the epidemiology of cancer: the population-based registries in São Paulo, Porto Alegre, Fortaleza, and Recife; the National Registry of Tumor Pathology (under the Ministry of Health); hospital oncological registries (which provide data on morbidity); and the Subsystem of Information on Mortality (under the Ministry of Health). However, the practical application of information made available through the health ser-

vices system is still deficient since it has not been integrated to support the programming of control activities. The National Cancer Information Seminar was organized in order to coordinate the different agencies and establish an epidemiological surveillance system for malignant neoplasms in Brazil. This system's potential usefulness lies in the possibility of consolidating and analyzing complementary data from other sources.

Determination of the role of the Cancer Information

System and of priorities for expansion should be based on a more exact definition of the information that is needed. Data collection should be in keeping with the objectives of a national policy for cancer control. The growing demand for "information for action" should serve as the point of reference for upgrading the information system, which should incorporate all of the country's available data sources. In this respect, the seminar should be viewed as part of a process whose continuity will be ensured by periodic meetings, the exchange of information, and other activities.

The National Campaign Against Cancer and the National Cancer Institute of Brazil are committed to setting up a broad national system for cancer, to integrate activities for prevention, early diagnosis, medical care, and research. The formulation of new programs and projects in these areas and the improvement of existing ones require a comprehensive system of epidemiological information to justify these activities and ensure their efficacy over the medium and long terms.

Consequently, the National Cancer Information Seminar, held from 25 to 28 June 1984 in Rio de Janeiro, Brazil, had the following objectives:

- To promote the exchange of information and experience among the technicians involved in the different programs and institutions that provide epidemiological information in general, and on cancer, in particular.
- To identify the methodological and practical problems that have been encountered and to establish the bases for the future implementation and improvement of a comprehensive cancer information system.
- To define priority categories for epidemiological research and joint studies on cancer in Brazil.

The seminar was cosponsored by the National Cancer Institute of Brazil and the Pan American Health Organization, which thus reiterated their support for the establishment of a national policy for the control of neoplasms. Institutions directly and indirectly involved in gathering information on cancer also participated. The discussions yielded conclusions and recommendations which are presented below.

In recognition of the significance to the Cancer Information System of the recent progress made by the Subsystem of Information on Mortality, it was recommended that the Ministry of Health continue its efforts to increase coverage and upgrade the reliability of information on mortality through the following activities:

- Promoting decentralization and the collection of data from death certificates in the townships and obtaining information from clandestine cemeteries.
- Encouraging the training of interns, residents, and physicians in the proper preparation of death certificates and in methods for improving the model for clinical histories, stressing the importance of the reliability of information for determining health conditions in the country. For cancer in

particular, priority must be given to training medical professionals working at the institutions that participate in the Comprehensive Cancer Control System (Sistema Integrado de Controle de Câncer).

- Promoting the establishment of mechanisms for integration of health offices and cancer registries, not only to complement the data in the registries, but also to improve the quality of the information on the basic causes of death that the registries collect.

The seminar also emphasized the fact that the sources of data on morbidity are of strategic importance for solving certain problems that have been observed in mortality statistics; moreover, they are essential for studies on etiology and risk factors. These sources include the population-based cancer registries, which are the only regular source of data on incidence, and the National Registry of Tumor Pathology in the Ministry of Health.

It is believed that these registries could be used for descriptive and etiologic studies as well as for the planning and evaluation of control activities, within the framework of prevention and early diagnosis. Currently in Brazil, this information is being used mainly, and most effectively, in descriptive studies, and as a basis for granting subsidies for the planning and evaluation of specific activities, such as the control of cancer of the uterine cervix.

With respect to population-based registries, whose scope is necessarily local, it was recommended that the Ministry of Health refrain from promoting new registries for the time being, until a specific need is demonstrated. The upgrading and reorganization of existing registries, individually and jointly, should focus on the following:

- Standardizing guidelines and procedures for the collection, preparation, analysis, dissemination, and utilization of data.
- Extending data collection to include additional sources, especially laboratories—cytopathology laboratories, for example.
- Carrying out studies and arranging institutional agreements to allow for the automation of procedures to monitor the increase in the number of cases and to process the data. It is recommended that the National Campaign Against Cancer, organized by the Ministry of Health, serve as the agent for this process.
- Reducing problems created by the scarcity of resources by means of measures such as: avoiding collection of information or preparation of separate reports on neoplasms of the skin; preparing and analyzing data every two to three years; and using computers to monitor inputs into and retrievals from the data file on registered deaths.
- Guaranteeing regular financing for population-based registries by allocating funds to a special allotment in the budget of the Ministry of Health, regardless of which institution is in charge of those registries. It is further recommended that other available funding sources be utilized, by formaliz-

ing agreements with state and municipal health agencies and teaching institutions.

The National Registry of Tumor Pathology, which covers over 300 pathology laboratories throughout the country, makes it possible to analyze the relative frequency and determine the minimum levels of incidence. The institutional consolidation of this registry, which represents a great wealth of information, will contribute to the continuity of the program. Specific recommendations follow:

- Operational studies should be carried out to determine the possibility of increasing the program's coverage by incorporating new pathology laboratories.
- Mechanisms should be introduced for evaluating data and guaranteeing their reliability.
- Professionals in the field of pathology should provide ongoing collaboration through programs for the development, training, updating, and improvement of the human resources.

The National Campaign Against Cancer should promote nationwide scientific production in the field of oncology by identifying and supporting groups and institutions involved in basic research and in clinical and epidemiological studies on pathological anatomy,

in order to establish advisory groups and, in time, reference centers in specific areas. In the same vein, it has been proposed that collaborative research be developed for presentation to national and international funding agencies.

With respect to the registries, suggested areas for research include descriptive and analytical epidemiological studies, operational evaluations related to quality control of the registries, epidemiological studies on medical care, and disease control activities in general. It is thought that, for the time being, analytical studies should have less priority than the others. Research on mortality should include, in addition to the analysis of regional cancer mortality profiles of specific sites and studies on survival, the composition of the group of ill-defined causes, and the validation of death certificates. It is also suggested that epidemiological data and studies be published in the *Revista Brasileira de Cancerologia* and presented to public health, oncology, and other specialized meetings.

(Source: Final Report, National Cancer Information Seminar. Rio de Janeiro, Brazil, July 1984.)

Calendar of Courses and Meetings

V Regional PAHO/WHO Course on the Bacteriology of Tuberculosis

This course will be held at the Pan American Zoonoses Center (CEPANZO) in Buenos Aires, Argentina, from 5 May through 13 June 1986. Its purpose is to provide training in the bacteriology of tuberculosis, particularly in laboratory methods, programming and supervision of laboratory work within control programs, and coordination between the laboratories and the medical and nursing staff for identifying cases of tuberculosis.

For more information, please contact the Pan American Zoonoses Center, Casilla 3092, Correo Central, 1000 Buenos Aires, Argentina.

VII Intensive Course on Epidemiological Methods

This course will be offered at Claude Bernard University in Lyon, France, from 16 June through 4 July

1986. It will be preceded by an optional refresher course on statistical methods to be held from 11 to 13 June. Participants must have a good working knowledge of French.

For more information, please contact the office of the PAHO/WHO Representative in your country.

Meeting on the Nutritional Regulation of Immunity and Infection

This meeting will be held in Toronto, Canada, from 3 to 5 July 1986 for the purpose of discussing the impact of nutritional deficiencies and excesses on the resistance and susceptibility to certain illnesses, including infectious diseases.

For more information, please contact: Professor Ranjit K. Chandra, Department of Pediatrics, Medicine, and Biochemistry, Memorial University of Newfoundland, St. John's, Newfoundland A1A 1R8, Canada.

Publications

Control of Communicable Diseases in Man. 14th ed. Abram S. Benenson, ed. Washington, D.C., American Public Health Association, 1985. 485 pages. ISBN 0 87553 130 X. US\$9.00, U.S.A. and Canada; US\$ 12.00, other countries of the Region.

This manual, first published in 1917, presents the essential facts for the control of communicable diseases in man. The new edition was compiled with the active participation of WHO, PAHO, and the health authorities of the major English-speaking countries. It is addressed to public health workers of official and voluntary health agencies, and, in particular, to physicians, dentists, veterinarians, sanitary engineers, nurses, social workers, health educators, and sanitarians.

The book provides immediate information on how to recognize a specific disease and manage the patients so that the disease does not spread. Since the last edition (1981) new chapters have been added; these include acquired immune deficiency syndrome

(AIDS), malignant neoplasia, cryptosporidiosis, Kawasaki syndrome, and hymenolepiasis.

The handy, pocket-sized format is tailored to the needs of the health worker in the field. The presentation is standardized. Each disease is briefly identified; its clinical nature, differentiation from related conditions, and laboratory diagnostic procedures are given. The infectious agent, occurrence, reservoir, mode of transmission, incubation period, period of communicability, and susceptibility and resistance follow. Methods of control are then described under the headings: preventive measures; control of patient, contacts, and the immediate environment; epidemic measures; disaster implications; and international measures. In addition, the manual contains definitions of approximately 50 terms and a complete index.

This book can be obtained from the American Public Health Association, 1015 Fifteenth Street, N.W., Washington, D.C. 20005, U.S.A. As with previous editions, PAHO will publish the Spanish and Portuguese versions of the 14th English edition; they will be included in the PAHO Scientific Publications Series and Textbook Program of the Organization.



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