Epidemiology and Cancer Prevention

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Contents

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Learning Objectives

By the end of the chapter, the reader will

- Be able to apply Public Health procedures
- Have learned the basic concepts of Public Health
- Have reached in-depth knowledge of Public Health
- Be able to put acquired knowledge into clinical practice Public Health

1.1 Introduction

The progress of cancer pathology in the world is studied by the cancer registries (CR), structures responsible for the systematic detection of cases of tumour that arise in a given population. The CRs use internationally defined standard rules for the registration of neoplasms that make data comparable on a global level. The main epidemiological indicators, which allow to describe the pathology, plan health interventions, and evaluate their impact, are incidence, mortality, survival, and prevalence.

The term incidence indicates the number of new cases diagnosed in a defined period, usually a year, in a defined population. Mortality is defined as the number of deaths for a specific disease over a defined period of time and for a specific population. Survival measures the probability of being alive after a certain time interval from diagnosis (usually 5 years from diagnosis); net survival is usually reported, i.e., the proportion of living patients net of other causes other than the tumour in question. The term prevalence indicates the number of subjects alive in a specific instant, in a given area, which in the past have faced a diagnosis of cancer: patients included in therapeutic treatments, patients in follow-up, but also subjects are included healed that have a life expectancy similar to that of the general population.

1.2 Epidemiology of Tumors

1.2.1 Incidence

There are 14 million new cancer cases per year in the world: 7,410,376 males and 6,657,518 females. Eight million (57%) occurred in the less developed regions. The overall age-standardized cancer incidence rate is almost 25% higher in men than in women, with rates of 205 and 165 per 100,000, respectively [1].

Male incidence rates vary almost fivefold across the different regions of the world, with rates ranging from 79 per 100,000 in Western Africa to 365 per 100,000 in Australia/New Zealand (Fig. 1.1). There is less variation in female incidence rates (almost threefold) with rates ranging from 103 per 100,000 in South-Central Asia to 295 per 100,000 in Northern America.

Excluding skin tumors (not melanomas), lung cancer (17% of all tumors) prevail in males followed by prostate cancer (15%), colorectal cancer (10%), stomach (9%), and liver (8%). Among females, breast cancer accounts for 25% of neoplasms, followed by colorectal cancer (9%), lung (9%), cervix uteri (8%), and corpus uteri (5%) (Table 1.1). However, the incidence is strongly influenced by the age groups: in males, leukemia is the most common cancer in both children (0–14 years) and young people (15–39 years). The liver is the most frequent neoplasm in young adults (40–44 years), while from 45 years of age, the lung tumor is the most common neoplasia with the exception of the 70–74 age group where the first neoplasm is the prostate. In females, with the exception of the 0–14 age group where the most common malignancy is leukemia, from 15 years on, the most frequent neoplasia is the breast in all age groups.

Overall, there is a strong geographical gradient between the most developed countries and the least developed countries: Australia and New Zealand, together with North America and Northern Europe and the Western European countries, have the highest incidences of tumors in the world. The countries of South Africa, Asia, and America, on the other hand, are those characterized by the lowest incidence (Fig. 1.2). This trend, however, is strongly influenced by tumor sites: in fact, while tumors such as breast and prostate, strongly related to incorrect lifestyles (nutrition, alcohol, etc.), are more frequent in developed countries, the liver and cervix are frequent neoplasms in the less developed.

With regard to time trends, in men in European countries, the incidence has increased since the first half

Fig. 1.1 Estimated cancer incidence worldwide in 2012, by sex

of the 1970s, but now some countries such as France and Denmark show a declining trend; in women, however, the incidence increases in all countries. In the Asian countries, Japan and China show a decreasing incidence, while the trend in other countries appears to be stable. Australia continues to show a growing trend; the incidence drops in the USA and New Zealand.

Table 1.1 The first five most frequently diagnosed cancers and proportion on the total of the tumors (excluding skin carcinomas) by sex

Rank	Males	Females
1°	Lung 16.8%	Breast 25.1%
2°	Prostate 14.8%	Colorectum 9.2%
3°	Colorectum 10.1%	Lung 8.8%
4°	Stomach 8.5%	Cervix uteri 7.9%
5°	Liver 7.5%	Corpus uteri 4.8%

1.2.2 Mortality

The deaths in the world for cancer are over eight million per year (about 4.5 men and 3.5 million women) with a standardized rate on the world population of 126.3 and 82.9, respectively. There is less regional variability than for incidence, the rates being 15% higher in more developed than in less developed regions in men and 8% higher in women. In men, the rates are highest in Central and Eastern Europe (173 per 100,000) and lowest in Western Africa (69) (Fig. 1.3).

In contrast, the highest rates in women are in Melanesia (119) and Eastern Africa (111) and the lowest

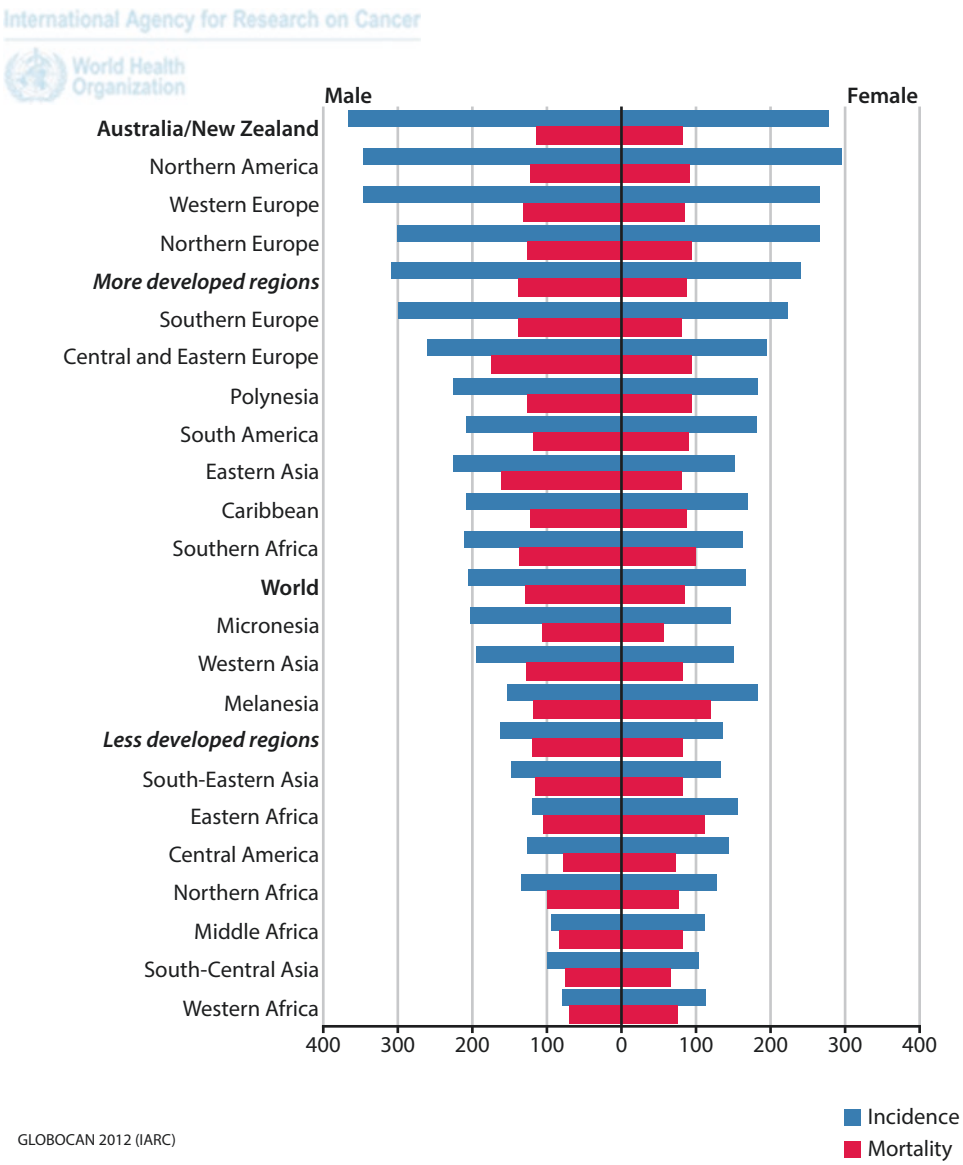

Fig. 1.2 Estimated cancer incidence and mortality by sex and region

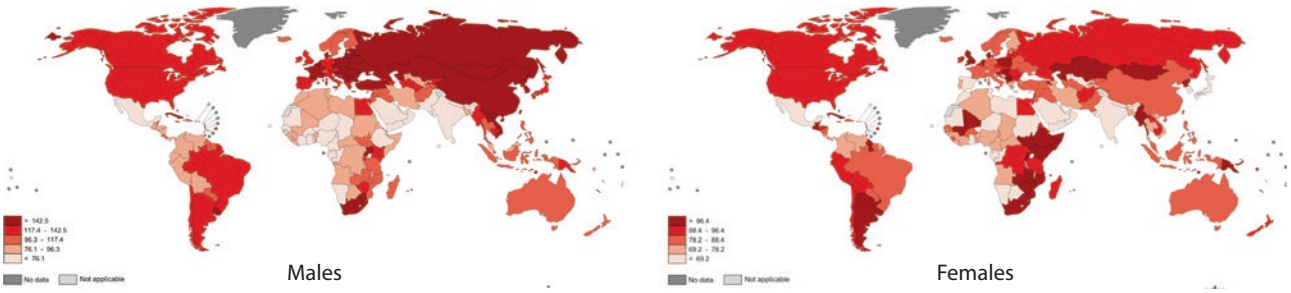

Fig. 1.3 Estimated cancer mortality worldwide in 2012: males and females

in Central America (72) and South-Central (65) Asia. The most lethal cancer are lung, liver, stomach, colon, and prostate in men and breast and lung, colon, cervix, and stomach in women.

There are also age-related differences for mortality: in children (0–14 years) and in young people (15–39 years), the highest rates of mortality are observed for leukemia. From 40 to 49 years, the highest mortality is observed for the liver, while from 50 years upwards, the lung is the leading cause of death in all age groups. In women, leukemia is the leading cause of death in children and young adults. The breast is the first cause from 40 to 64 years, while the age of 65 is the first cause of death.

With regard to mortality, there are significant differences with the highest rates in Asia. Also for mortality there is a gradient between the more developed and less developed regions with an approximately double mortality both in men (3062 vs 1592) and in women (2261 vs 1287). Fortunately, mortality rates are falling across the world, in both sexes.

1.2.3 Survival

Survival is the main outcome in the field of oncology and allows, through the measurement of time from the diagnosis, to evaluate the effectiveness of the health system as a whole against the tumor pathology. Survival, in fact, is conditioned by two aspects: the phase in which the disease is diagnosed and the effectiveness of the therapies undertaken. Therefore, both secondary prevention interventions and the availability and access to effective therapies affect survival.

CONCORD-3 updates the worldwide surveillance of cancer survival to 2014 and includes individual records for 37.5 million patients diagnosed with cancer during the 15-year period 2000–2014. For most cancers, 5-year survival remains among the highest in the world in the USA and Canada, in Australia and New Zealand, and in Finland, Iceland, Norway, and Sweden [2].

Survival trends are generally increasing, even for some of the more lethal cancers: in some countries, survival has increased by up to 5% for cancers of the liver, pancreas, and lung. For women diagnosed during 2010–2014, 5-year survival for breast cancer is now 89.5% in Australia and 90.2% in the USA, but international differences remain very wide, with levels as low as 66.1% in India. For gastrointestinal cancers, the highest levels of 5-year survival are seen in Southeast Asia. By contrast, in the same world region, survival is generally lower than elsewhere for melanoma of the skin and for both lymphoid malignancies and myeloid malignancies.

For children diagnosed during 2010–2014, 5-year survival for acute lymphoblastic leukemia ranged from 49.8% in Ecuador to 95.2% in Finland. 5-year survival from brain tumors in children is higher than for adults, but the global range is very wide (from 28.9% in Brazil to nearly 80% in Sweden and Denmark). In the poor prognosis tumors (stomach, lung, and liver), the differences were less significant, and even in more recent years, the developed countries showed very modest progress (Table 1.2).

1.2.4 Prevalence

There are 32.6 million people living with cancer (within 5 years of diagnosis) worldwide: about 15 million men and 17 million women. Prevalence is influenced by the incidence of the disease and survival, and therefore the geographical variability is very high: in men over 6 million are present in Asia (40%), 4.5 million in Europe (30%), 2.6 million in North America (17%), 1.1 million in Latin America (8%), 632,000 in Africa (4%), and 239 in Oceania (1.6%). In women over 7 million are present in Asia (42%), 4.5 million in Europe (27%), 2.6 million in North America (15%), 1.4 million in Latin America (9%), 1.1 million in Africa (7%), and 207,000 in Oceania (1.2%). There is also a strong variability linked to the site of the tumor: the breast (6 million) and prostate (4 million) are the most represented sites in women and men, respectively, followed by colorectal, lung, and cervix (Fig. 1.4).

The estimated overall trend in the present decade in Italy (+ 3.2% per year) is comparable to that estimated in the same period in the USA (+ 2.8% per year), UK (+ 3.3%), and Switzerland (+ 2.5%) [3].

Table 1.2 Age-standardized 5-year net survival (%) by continent, country and calendar period of diagnosis

Area	Good prognosis						Poor prognosis					
Site	Breast		Colon		Children LLA		Stomach		Lung		Liver	
Period	2000 2004	2010 2014	2000 2004	2010 2014	2000 2004	2010 2014	2000 2004	2010 2014	2000 2004	2010 2014	2000 2004	2010 2014
North America												
Canada	86	88	62	67	91	93	25	30	16	21	17	19
US	89	90	65	65	87	90	26	33	17	21	12	17
Europe												
Italy	84	86	59	64	83	88	32	31	14	16	16	20
Norway	85	88	60	67	88	83	22	27	12	19	8	19
Asia												
China	76	83	51	53	62	58	30	36	19	20	12	14
South America												
Brazil	69	75	45	48	68	66	19	20	11	9	15	11
Africa												
Algeria	39	77	88	74	31	–	21	42	18	34	6	14

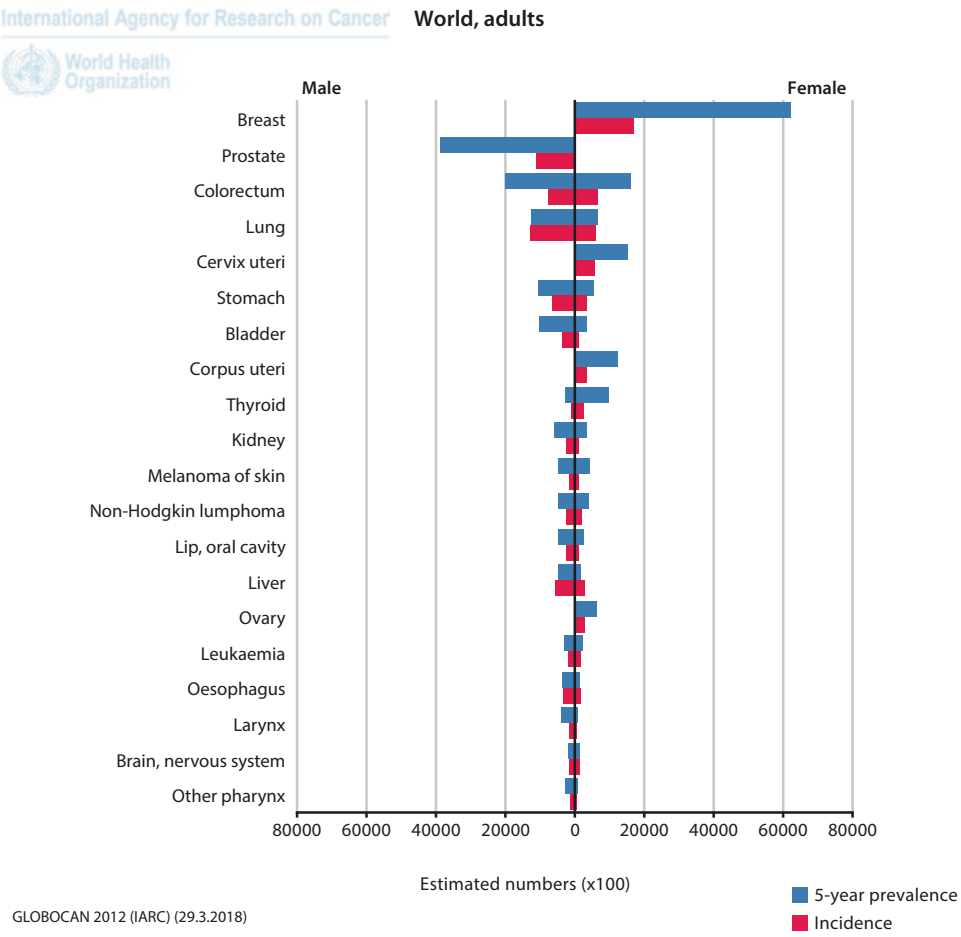

Fig. 1.4 Global estimation of cancer 5-year prevalence and annual incidence by site and sex in 2012

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1.3 Risk Factors

The known causes of DNA alterations in the genesis of cancer include environmental, genetic, infectious, lifestyle factors, and random factors. The share of tumors attributable to the various risk factors has been extensively studied: tobacco smoking is responsible for 33% of the neoplasms; the diet is responsible for 5%, but the percentage rises to 20% if one is considered overweight and obesity. Physical inactivity is associated with the development of colorectal and breast tumors. Alcohol abuse is responsible for 3% of cancers. All these risk factors depend on the habits of the individual citizen and are therefore preventable risk factors. Employment factors are responsible for 5% of cancers, infections cause about 8% of tumors, ionizing radiation and exposure to UVA are responsible for 2%, and environmental pollution contributes another 2%.

Inheritance has a very low incidence in the tumor genesis: less than 2% of the population is carrier of mutations with hereditary syndromes of neoplastic risk. BRCA 1 and 2 genes are known to increase the risk of breast and ovarian cancer, PALB 2 (partner and localization of BRCA 2), and MSH2 and MLH1 for nonpolyposis colon cancer (HNPCC).

IARC (International Agency for Research on Cancer) has published the list of human carcinogens and includes both those for which there is sufficient evidence than those with limited evidence in humans [4]. A summary is shown in Table 1.3.

Table 1.3 Agents (extract) classified as carcinogenic to humans and associated cancer sites (IARC)

	Sufficient evidence in humans	Limited evidence in humans
Chemicals and mixtures		
Formaldehyde	Leukemia, nasopharynx	Nasal cavity and paranasal sinus
Benzene	Leukemia	
Occupations		
Aluminum production	Lung, urinary bladder	
Isopropyl alcohol production	Nasal cavity and paranasal sinus	
Metals		
Chromium compounds	Lung	Nasal cavity and paranasal sinus
Nickel compounds	Lung, nasal cavity, and paranasal sinus	
Dusts and fibers		
Asbestos	Larynx, lung, mesothelioma, ovary	Colorectum, pharynx, stomach
Leather dust, wood dust	Nasal cavity and paranasal sinus	
Radiation		
Radium 226, radium 228	Bone, mastoid process, paranasal sinus	
Biological agents		
Epstein-Barr virus	Burkitt lymphoma, Hodgkin lymphoma, etc.	Lymphoepithelial-like carcinoma, stomach
Hepatitis B, C	Liver	Cholangiocarcinoma
Human papillomavirus 31, 35, 39, 45, 51, 52, 56, 58, 59	Cervix	
Helicobacter pylori	Lymphoma, stomach	

1.4 Primary Prevention

It has been known for many decades that tumors are largely preventable with individual and collective actions, a fact officially recognized for the first time in 1964 by the World Health Organization. Primary prevention includes all the procedures and interventions implemented to prevent the onset of the tumor. Since the genesis of tumors is multifactorial, it is not always possible to eliminate the causes of cancer to prevent the onset of the tumor but certainly reduces the probability that this occurs.

Between 30 and 50% of all cancer cases are preventable. Prevention offers the most cost-effective long-term strategy for the control of cancer. National policies and programs should be implemented to raise awareness, to reduce exposure to cancer risk factors, and to ensure that people are provided with the information and support they need to adopt healthy lifestyles [5].

Table 1.3 (continued)

	Sufficient evidence in humans	Limited evidence in humans
Personal habits		
Alcoholic beverages	Breast, colorectum, larynx, liver, esophagus, oral cavity, pharynx	Pancreas
Tobacco smoking	Bone marrow, cervix, colorectum, kidney, larynx, liver, lung, nasal cavity and paranasal sinus, esophagus, pancreas, pharynx, stomach, ureter, urinary bladder, in smokers' children: hepatoblastoma	Breast, in smokers' children: leukemia
Pharmaceuticals		
Cyclosporine	NHL, skin, multiple other sites	
Estrogen menopausal therapy	Endometrium, ovary	Breast
Estrogen-progestogen contraceptives	Breast, cervix, liver	
Estrogen-progestogen menopausal therapy	Breast, endometrium	

1.4.1 Tobacco

Worldwide, tobacco use is the single greatest avoidable risk factor for cancer mortality and kills approximately six million people each year, from cancer and other diseases. Tobacco smoke has more than 7000 chemicals; at least 250 are known to be harmful; and more than 50 are known to cause cancer.

Tobacco smoking causes many types of cancer (Table 1.2), including cancers of the lung, esophagus, larynx (voice box), mouth, throat, kidney, bladder, pancreas, stomach, and cervix. Second-hand smoke, also known as environmental tobacco smoke, has been proven to cause lung cancer in nonsmoking adults. Smokeless tobacco (also called oral tobacco, chewing tobacco, or snuff) causes oral, esophageal, and pancreatic cancer. Nearly 80% of the 1 billion smokers in the world live in low- and middle-income countries.

- Tobacco smoking: causes cancers of the lung, esophagus, larynx (voice box), mouth, throat, kidney, bladder, pancreas, stomach, and cervix
- Second-hand smoke (also known as environmental tobacco smoke): causes lung cancer in nonsmoking adults
- Smokeless tobacco (also called oral tobacco, chewing tobacco, or snuff): causes oral, esophageal, and pancreatic cancer

1.4.2 Physical Inactivity, Dietary Factors, Obesity, and Being Overweight

Dietary modification is another important approach to cancer control. There is a link between overweight and obesity to many types of cancer such as esophagus, colorectum, breast, endometrium, and kidney. Diets high in fruits and vegetables may have an independent protective effect against many cancers. Regular physical activity and the maintenance of a healthy body weight, along with a healthy diet, considerably reduce cancer risk. In addition, healthy eating habits that prevent the development of diet-associated cancers will also lower the risk of other noncommunicable diseases.

1.4.3 Alcohol Use

Alcohol use is a risk factor for many cancer types including cancer of the oral cavity, pharynx, larynx, esophagus, liver, colorectum, and breast. Risk of cancer increases with the amount of alcohol consumed. For several types of cancer, heavy drinking of alcohol combined with tobacco use substantially increases the risks of cancer. In 2010, alcohol-attributable cancers were estimated to be responsible for 337,400 deaths worldwide, predominantly among men.

1.4.4 Infections

In 2012, approximately 15% of all cancers were attributable to infectious agents such as *Helicobacter pylori*, human papilloma virus (HPV), hepatitis B and C, and Epstein-Barr virus. The fraction of infection-attributable cancers varied between countries and development status, from less than 5% in Australia, Canada, New Zealand, the United States, and select countries in Western and Northern Europe to more than 50% in some countries in sub-Saharan Africa. Two-thirds of infection-attributable cancers (1.4 million cases) occur in less developed countries. Vaccines are available for hepatitis B virus and some types of HPV and can reduce the risk of liver and cervical cancers, respectively.

1.4.5 Environmental Pollution

Pollution of air, water, and soil with carcinogenic chemicals contributes to the cancer burden to differing degrees depending on the geographical settings. Outdoor air pollution is classified as carcinogenic, or cancer-causing, for humans. It has been estimated that outdoor air pollution contributed to 3.2 million premature deaths worldwide in 2012 including more than 200,000 lung cancer deaths. Additionally, over four million people die prematurely from illness attributable to the household air pollution from cooking with solid fuels; 6% of these deaths are from lung cancer.

Indoor air pollution from coal fires doubles the risk of lung cancer, particularly among nonsmoking women. Exposure to carcinogens also occurs via the contamination of food, such as aflatoxins or dioxins.

1.4.6 Occupational Carcinogens

More than 40 agents, mixtures and exposure circumstances in the working environment are carcinogenic to humans and are classified as occupational carcinogens. Occupational cancers are concentrated among specific groups of the working population, for whom the risk of developing a particular form of cancer may be much higher than for the general population. It is well-documented that occupational carcinogens are causally related to lung cancer, mesothelioma, and bladder cancer. For example, mesothelioma (cancer of the outer lining of the lung or chest cavity) is to a large extent caused by work-related exposure to asbestos.

1.4.7 Radiations

Exposure to all types of ionizing radiations, from both natural and man-made sources, increases the risk of various types of malignancy including leukemia and a number of solid tumors. Risks increase when the exposure occurs at a young age and also when the exposure amount is higher. Ultraviolet (UV) radiation, and in particular solar radiation, is carcinogenic to humans, causing all major types of skin cancer, such as basal cell carcinoma (BCC), squamous cell carcinoma (SCC), and melanoma. Avoiding excessive exposure, use of sunscreen, and protective clothing are effective preventive measures. UV-emitting tanning devices are now also classified as carcinogenic to humans based on their association with skin and ocular melanoma cancers. Radiation is used in medicine and can help save lives as well as prevent the need for more invasive procedures. However, inappropriate use may cause harm because of unnecessary and unintended radiation doses for patients. Radiologic tests and procedures should be appropriately prescribed and properly performed to reduce unnecessary radiation doses, particularly in children.

Residential exposure can also arise from radon, a naturally radioactive gas sometime present in soil, and building materials increase risk of lung cancers. Radon levels in homes can be reduced by improving the ventilation and sealing floors and walls.

1.5 Oncological Screening and Early Diagnosis

Oncological screening is a public health intervention that aims to invite an apparently healthy population to carry out a diagnostic test with the intent of discovering a possible neoplasia in a very early phase. The goal of cancer screening is to reduce mortality for that cancer and, if possible, reduce its incidence. The first objective is reached more than with the increase of the early forms, with the reduction of the advanced forms (stage IV) that bring the patient to death. On the other hand, reducing the incidence of neoplasia is only possible for those sites where the evolutionary path of the lesion is well-known: benign lesion, premalignant lesion, and cancerous lesion as in the case of the colon and the uterine cervix. To date, there are three screening programs for which a positive cost-benefit ratio has been demonstrated. Breast cancer screening for women aged 50–69 years (but many regions have widened the target population to 45–74 years); cervical screening for women aged 25 to 64; and colorectal screening involving even the male population aged 50–69 years.

The monitoring of the activity of screening programs, through appropriate indicators, is essential for the verification of the performances of the programs themselves. In fact, institutional programs are characterized not only by the offer of the test but also by the care of the person for the whole prevention path and by the presence of quality monitoring systems that are carried out through the control of the indicators in the various phases.

1.5.1 Breast Cancer

Early diagnosis strategies focus on providing timely access to cancer treatment by reducing barriers to care and/or improving access to effective diagnosis services. The goal is to increase the proportion of breast cancers identified at an early stage, allowing for more effective treatment to be used and reducing the risks of death from breast cancer.

Mammography is a radiological examination of the breast, effective for identifying breast tumors early, as it allows to identify the nodules, even small, not yet perceptible to the touch. The organized screening programs provide that the exam is performed by visualizing the breast both from the top to the bottom and from the side. A large study is published in the *Journal of Medical Screening* in September 2012, and reviewing published research on breast cancer screening programs in Europe has shown that mortality is reduced by 25% for women undergoing screening [6].

A recent Italian study shows a significant reductions among attenders for specific cancer stages; the authors observed a 39% reduction for T2 or larger (IRR = 0.61; 95% CI: 0.57–0.66), 19% for node positives (IRR = 0.81; 95% CI: 0.76–0.86), and 28% for stage II and higher (IRR = 0.72; 95% CI: 0.68–0.76) [7].

1.5.2 Cervix Cancer

WHO has reviewed the evidence regarding the possible modalities to screen for cervical cancer and has concluded that screening should be performed at least once for every woman in the target age group (30–49 years) when it is most beneficial; HPV testing, cytology, and visual inspection with acetic acid (VIA) are all recommended screening tests; cryotherapy or loop electrosurgical excision procedure (LEEP) can provide effective and appropriate treatment for the majority of women who screen positive for cervical precancer; and "screen-and-treat" and "screen, diagnose, and treat" are both valuable approaches. Regardless of the approach used, the key to an effective program is to reach the largest proportion of women at risk with quality screening and treatment. Organized screening programs designed to reach most women at risk are preferable to opportunistic screening.

A recent review report that FDA advisory panel recommended the use of HPV testing alone. This recommendation was based on data showing the long-term predictive value of a positive high-risk HPV test result. In an ideal world, in which women have regular follow-up, primary HPV screening is as effective as primary cytology screening. The duration of the protective effect of a negative HPV-negative test is twice as long as for a negative cytology test because cytologic changes are downstream of HPV acquisition. Clear algorithms for reflex cytology and for appropriate colposcopy referrals can balance the loss of specificity with HPV testing. The challenge with a new screening paradigm of primary HPV testing, which reduces the frequency of surveillance, will be to assure robust tracking and follow-up of women at risk for cervical cancer [8].

1.5.3 Colorectal Cancer (CRC)

In Europe the recommendation on cancer screening is a shared EU-level commitment to take practical steps to reduce it. Differences in cancer control strategies and survival rates among states are a further major challenge; meeting it requires a complex multidisciplinary approach. However the most important goal is to increase screening participation. Over time this will help prevent deaths due to CRC and improve the quality of life for millions of people who are at risk of developing one of the most common cancers in Europe and the world. It can no longer be accepted that a tumor that can be diagnosed by screening at an early and surgically treatable stage should continue to cause so many deaths [9].

An Italian study included 23,668 CRCs diagnosed in subjects aged 50–69 years showing a higher proportion of males, of cases in the distal colon, and a higher mean age of the patients. Compared with pre-screening cases, screen-detected CRCs showed a better distribution by stage at diagnosis (OR for stage III or IV: 0.40, 95% CI: 0.36–0.44) and grading (OR for poorly differentiated CRCs was 0.86, 95% CI: 0.75–1.00). Screen-detected CRCs have more favorable prognostic characteristics than non-screen-detected cases [10].

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1.6 Cancer Registries

The epidemiology of cancer is monitored by the constant activity of cancer registries (CR), structures dedicated to the collection and analysis of incidence, survival, and prevalence of malignant tumors that occur in a given population. The data produced by the CR are used for descriptive epidemiology, impact assessment of cancer screening, health planning, research support, and risk assessment in environmental epidemiology. The registration activity takes place actively, using primary sources (hospital discharge records, pathological reports, death certificates, medical records, personal data, and general practitioners) and ancillary sources (exemptions, outpatient specialist services, laboratory exams, radiological examinations, palliative care, home care, and screening services). To ensure that the data collected by the CR are reliable and comparable, they adopt international standard rules (International Association of Cancer Registry) [11].

The registration activity underlies in fact mandatory rules that include:

- Completeness: elimination or minimization of the loss of incident cases
- Accuracy: minimization of the presence of incorrect, incongruent, or imprecise data
- Timeliness: guarantee of a minimum production time of the incidence and survival data
- Comparability: adoption of international standards and continuous updating
- Training: commitment to consolidate staff skills
- Respect for privacy: minimization of treatment and elimination of unnecessary use of sensitive data
- Continuity: guarantee of financial autonomy, resources, and skills
- Quality: commitment to measure, verify, and improve over time the respect of the previous principles

At an international level, the coverage of the CR is very inhomogeneous. Figure 1.5 shows the international coverage of CR: in regions with high HDI (human development index), the coverage of CR is very variable as far as 95% of North America, 78% of Oceania, and 42% of Europe. In countries with low HDI coverage, it is extremely low and does not reach 10%: 8% in Latin America, 6% in Asia, and just 2% in Africa. The same problem also afflicts the vital registration.

The availability of good quality population data would allow a continuous monitoring of the effects of the planning and prevention activities carried out in the various countries.

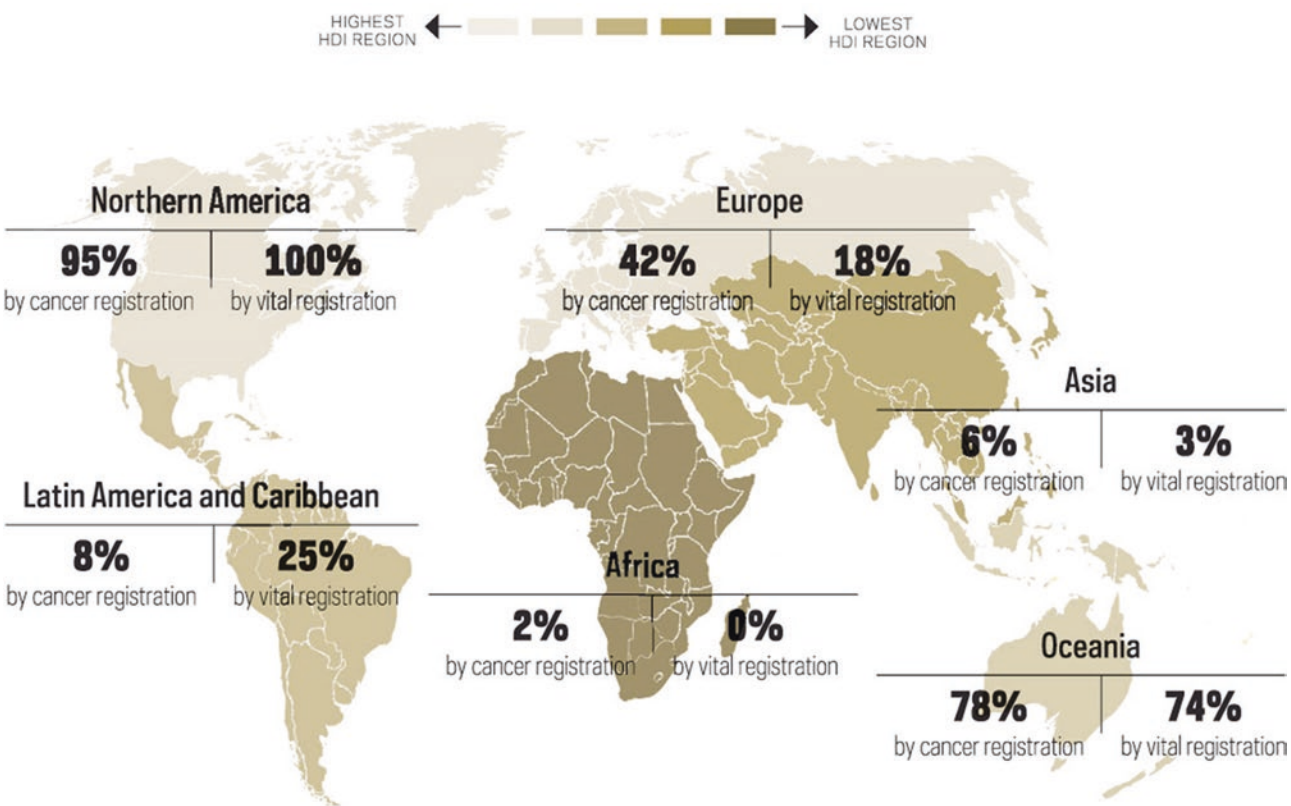

Fig. 1.5 International coverage of cancer registries by continents and human development index (HDI)

Key Points

1. There are 14 million new cancer cases per year in the world.
2. Excluding skin tumors (not melanomas), lung cancer (17% of all tumors) prevail in males followed by prostate cancer (15%), colorectal cancer (10%), stomach (9%), and liver (8%). Among females, breast cancer accounts for 25% of neoplasms, followed by colorectal cancer (9%), lung (9%), cervix uteri (8%), and corpus uteri (5%).
3. Obviously there is a consistent region variability in terms of incidence, prevalence, and types of tumors.
4. Survival trends are generally increasing, even for some of the more lethal cancers: in some countries, it has increased by up to 5% for cancers of the liver, pancreas, and lung.
5. 32.6 million people living with cancer (within 5 years of diagnosis) worldwide: about 15 million men and 17 million women. Prevalence is influenced by the incidence of the disease and survival.
6. Primary prevention includes all the procedures used to prevent the onset of the tumor.
7. Cancer registries are used to monitor constantly the number of neoplasms in a given population with the intent of studying their features and the characteristics of the patients.

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