CHILDHOOD AND ADOLESCENT CANCER IN BRAZIL

DATA FROM MORTALITY AND POPULATION-BASED REGISTRIES

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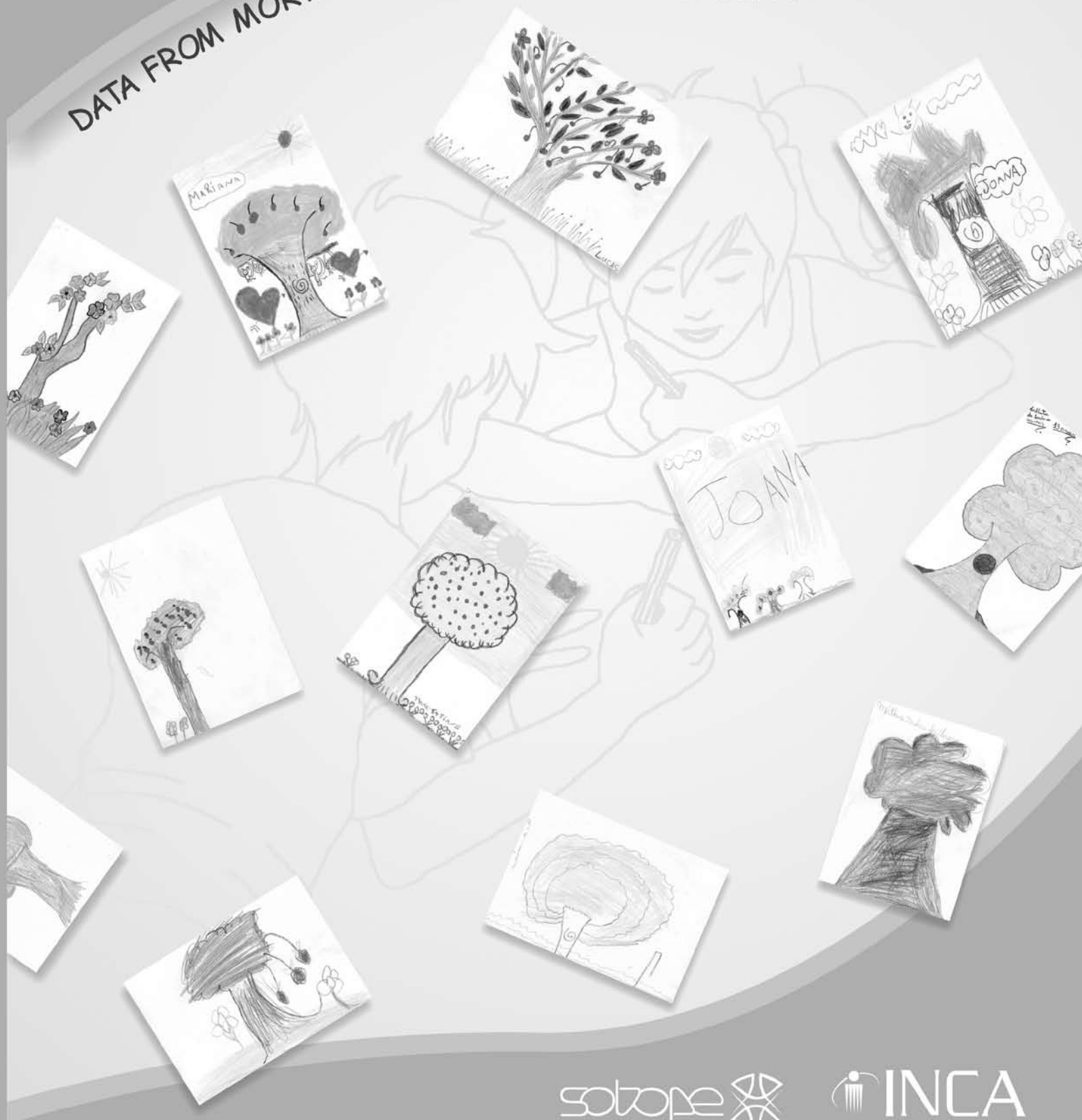

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Preface

In 2007, the National Cancer Institute (Instituto Nacional de Câncer - INCA) completed 70 years. A close examination of this exceptional public health institution reveals a trajectory of permanent coherence with its founding principles and constant ability to transform. Along with the commitment and professional competence that are present in the work routine, both former elements are decisive factors that have elevated INCA to a renowned status in the international oncology scene and play a crucial role in combating increasing challenges, evermore widespread and complex with the increase of cancer incidence.

In line with INCA's tradition of change, an innovative concept in 2003 revealed a great potential for transforming the paradigm of cancer assistance in Brazil. Its practical reverberation is shown, among other forms, by results such as this publication. The definition of cancer as a public health issue, the consequent need for health services to contribute in all levels of complexity, the participation of civil society institutions – in terms of supporting, executing and formulating policies and programs - the concern for increasing visibility and widespread knowledge of cancer, and the inclusion of cancer control in the agenda of means of communication and authorities, all of these factors translated into the effort of building a cancer attention network with enough amplitude and consistency to sustain the variety and complexity of necessary actions.

At INCA, care for children and adolescents suffering with cancer began in 1957, when the building located at Praça da Cruz Vermelha was erected in downtown Rio de Janeiro. Since its inception, pediatric oncology appeared in the institution not only to treat frequent cases of solid malignant tumors but also to create the necessary assistance conditions and social well-being. The ongoing pursuit of excellence in medical assistance allowed for expressive improvement of the results, but was deterred by the advanced stages in which patients arrived at the institution. A new understanding of the oncological issue created more partnerships – internal and external to the health sector – and led to the organization of the Permanent Forum of Integral Assistance for Children and Adolescents with Cancer (Fórum Permanente de Atenção Integral à Criança e ao Adolescente com Câncer). This Forum presents itself as a concrete space where confluent experiences are developed in different projects and initiatives within the field, while organizing a common heritage that will serve to enrich and improve the battle against childhood and adolescent cancer, aiming at reaching the intended impact on mortality indicators.

The wide representational scope of the Permanent Forum – gathering scientific societies, support groups, public health agencies, among others – has allowed us to develop pilot projects whose central strategy involves basic assistance professional qualification to face the initial challenge of increased survival, which is early diagnosis. This approach considers that the aim should be integral assistance to the child's health, thus not relinquishing a well-collected anamnesis, a careful physical examination, or any requisites of a high-quality medical appointment. It also considers that the even most up-to-date field of knowledge, albeit essential, does not solve the problems of routine practice. The

local sanitary authorities must be involved and claim responsibility, organize flowcharts, establish references and referrals, and built networks.

Among other lines of work, the Permanent Forum dedicates efforts to evaluating and monitoring structural characteristics, among which are specialized human and infrastructural resources, that are capable of establishing a quality levels for assistance in high-complexity oncopediatric units, given the reality of Brazil's publicly funded healthcare system, the Unified Health System (Sistema Único de Saúde – SUS). This background, where scientific refinement and managerial excellence is sought, is the context in which this publication is understood. Since 1995, INCA calculates and publishes cancer estimates for Brazil, considering the most frequent primary sites, disaggregating them by state and capitals, and allowing its widespread use throughout many society segments. In order to render these estimates viable, it is essential that quality information is produced – mostly originating from the Population-Based Cancer Registries (PBCR), supervised by INCA/MS, and the Mortality Information System (Sistema de Informação sobre Mortalidade - SIM), by the Ministry of Health, centralized nationally by the Health Surveillance Secretariat (Secretaria de Vigilância à Saúde - SVS/MS) – and the perfection of methodological criteria, which generates increased visibility and widespread use and credibility.

However, a special gap remained, the demand for systemization and qualification of information concerning cancer in children and adolescents. Previously unseen in Brazilian literature, this initiative would not succeed without the decisive participation of the Brazilian Society of Pediatric Oncology (Sociedade Brasileira de Oncologia Pediátrica -SOBOPE). With more than a quarter century's worth of services geared towards children and adolescents in Brazil, this institution currently plays a critical role in widening the approach of the problem. Its mission is to closely oversee specialized medical practice, SOBOPE seeks involvement in qualifying non-specialist doctors for precocious suspicion of cancer, in organizing networks of distinguished support and assistance and, as in this case, in the quality and diffusion of relevant information.

Offering evidence of obliging commitment to survival and excellence in services rendered to the population, it is with great pride and satisfaction that we present to health professionals and to all of society the book Childhood and Adolescent Cancer in Brazil. Data From Mortality and Population-Based Registries.

Luiz Antonio Santini Rodrigues da Silva
General Director
INSTITUTO NACIONAL DE CÂNCER

Forward

The National Cancer Institute (Instituto Nacional do Câncer - INCA) and the Brazilian Society of Pediatric Oncology (Sociedade Brasileira de Oncologia Pediátrica - SOBOPE) have been engaging efforts to improve the diagnosis, treatment, cure, and well-being of children suffering from cancer in Brazil.

Both knowledge and data analysis of any type of health disorder are crucial decision-making elements for attaining scientific progress. This knowledge is derived from information in epidemiological studies and research, as well as oncology databases of cancer registries.

Mortality rates represent an important asset for analyzing most health indicators, including in developed or industrialized countries. Cancer mortality rates are possible indicators for measuring progress in fighting the disease. Pediatric cancer incidences are no different throughout various parts of the world, no matter what stage of development they are in, and pediatric cancer mortality rates may be considered a suitable measure of each country's access to health care.

In this sense, we seek to describe Brazilian mortality rates obtained from Mortality Information Systems (SIM), results published in a variety of Brazilian institutions, and population-based registries pertaining to other countries. Due to specific methodological characteristics, it was not possible to cross all the population data since they record different periods of time; therefore, rather than the incidence rate of childhood and adolescent cancer in Brazil, we present the incidence rates of population-based records of different regions.

This initiative represents an important benchmark in the field of pediatric oncology care. In the next edition, we hope to reevaluate the results of the interventions conducted in the diagnosis and treatment of childhood and adolescent cancer.

Beatriz de Camargo, Cláudio Pompeiano Noronha, Juliana Moreira de Oliveira Ferreira, Julio Fernando Pinto Oliveira, Marceli de Oliveira Santos, Maria do Socorro Pombo de Oliveira, Marise Souto Rebelo, Rejane de Souza Reis, Renato Melaragno e Sima Ferman

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Introduction

Childhood and adolescent cancer is rare if compared to adult cancer, as it consists of 2-3% of all malignant tumors, thus rendering descriptive epidemiology indispensible for the international comparison of results. The Instituto Nacional de Câncer estimates that there will be around 9,890 cancer patients under 19 years old, per year, by 2009 (INCA, 2007). Brazil has a young population: a 2007 estimate reveals that 38% of the population is under 19 years old (Brazilian Ministry of Health, 2008).

Pediatric cancer is one of the leading causes of death between the ages of 0 and 14 years old – second only behind death by accidents – in developed countries (Little, 1999). In developing countries, it stands out as the most important cause of death, perhaps owing to current prevention policies for other childhood diseases in developing countries. Cancer mortality rates are seen as the best measures of progress in the battle against cancer (Extramural Committee to Access Measures of Progress Against Cancer, 1990). The cancer mortality rate in children and adolescents between ages 1 and 19, in Brazil in 2005, corresponded to 8% of all death cases. Cancer is therefore the second cause of death in this age range. Considering that the first cause of death is attributed to external factors, including accidents and violence, we understand that cancer mortality is currently the first cause of death by disease in the Brazilian population. Relating this mortality data to the specific organization of health services, especially to child and adolescent healthcare, may bring new challenges for oncology care and the Brazilian Unified Healthcare System (Sistema Único de Saúde – SUS).

Childhood cancer must be studied separately from adult cancer because it exhibits different primary tumor locations, different histological origins, and different clinical behavior. Furthermore, it usually presents smaller latency periods, tends to grow faster, and becomes very invasive, though it also displays better response to chemotherapy. Most pediatric tumors present histological descriptions that are similar to fetal tissues in different stages of development and are therefore considered embryonic. This resemblance to embryonic structures generates wide morphological diversity as a result of constant cellular transformation, and may contain a varied degree of cellular differentiation. Consequently, the classification system used in pediatric cancer differ from that used in adults. Morphology is the main factor considered in pediatric tumors. The International Agency for Research on Cancer (IARC) proposed a classification system described by Birch and Marsden (1987), modified by Kramarova and Stiller (1996), and currently used by population-based registries (ANNEX 1, CHART 2). In 2005, a new classification system was published with minor modifications, according to the Third Edition of the International Classification of Diseases for Oncology (ICD-O-3) (Steliarova-Foucher, 2005). These classification systems include benign tumors of the central nervous system. The Instituto Nacional de Câncer (INCA), through the Prevention and Surveillance Coordination Center (CONPREV), the Research Center and the Pediatric Oncology Section collaborating, with the authors' consent, translated the article with an up-to-date classification system (ANNEX 1, CHART 3).

In order to describe cancer epidemiology in a given population, incidence, mortality and survival must be known. Incidence is found through the use of population-based cancer registries that continuously and systematically list all new cancer patients in a given population and geographic area. Mortality information can be found through mortality databases. Survival information can be found through population-based records, hospital-based registries, and controlled clinical studies. Clinical trials may be considered the "gold standard" for evaluating the treatment. Hospital records and clinical studies merely represent a fraction of the selected population, since they depend on hospital referrals and patients' eligibility criteria. Population-based studies are essential for measuring the treatment's impact on the patients as well as the country or region's healthcare system.

Incidence

The main component required in epidemiological surveillance is represented by continuous follow-up of the regional incidence of the disease. This activity is typically carried out by population-based cancer registries - PBCR. There are currently 28 population-based cancer registries implemented or in implementation phase in Brazil. Twenty out of these possess consolidated information, i.e., at least one-year's worth of information on new cases (incidence) (Instituto Nacional de Câncer, 2007).

In the area covered by SEER – Surveillance, Epidemiology and End Results[a]) in the United States from 1990 to 1995, the average annual incidence rate, adjusted by the Standard American population in 1970, was 149 cases per million below age 20 (Ries, 1999). In the 0-14 age group, acute lymphatic leukemia (ALL) was the most common type of leukemia, representing 23% of all cancers. The second most common cancer is the non-lymphoid leukemia or acute myeloid leukemia (AML), which occurs 1/5 as much as ALL. The central nervous system tumors correspond to 22.1% and, along with both leukemias, compose half of all cancers that occur in this age group. The other most common solid tumors was neuroblastoma (7.7%), followed by Wilms' tumor (5.9%) and Non-Hodgkin lymphoma (5.9%). In Europe, information from Automated Childhood Cancer Information (ACCIS) reveal an average incidence rate, adjusted by Standard World population, was 140 new cases per million in children (aged 0-14) and 157 new cases per million in children and adolescents (aged 0-19) (Steliarova-Foucher, 2004).

A recent North-American study, encompassing over 90% of the population, pointed out that, between 2001 and 2003, the average age-adjusted incidence rate was 165,92 per million children and adolescents (aged 0-19). The average incidence was 174.28 per million for the male sex and 157.14 per million for the female sex (Li, 2008).

In the United Kingdom, the annual incidence rate in children below 15 between 1991 and 2000 was 139 per million (Stiller, 2007).

The first large-scale worldwide data compilation about cancer incidence of childhood cancer was published by Parkin et al. (1988). This information was based on cancer registries, codified according to morphology and not simply by anatomical site. Population-based cancer registries for Brazil showed data from São Paulo (1969-1978), Recife (1967-1979), and Fortaleza (1978-1980). The information was stratified by age group (under 12 months old; ages 1 to 4; ages 5 to 9; ages 10 to 14) and sex. In these locations, leukemia was the most common cancer in practically all age groups, both male and female.

There was high incidence rate for all cancers, particularly lymphomas, in Fortaleza and São Paulo. For the boys, lymphomas were most common in the 5-9 age group, with rates of 45.9 and 53.1 per million inhabitants, respectively. The incidence rates of acute lymphoid leukemia, unlike what has been observed in other registries worldwide, were low, especially in the 1-4 age group. The incidence rates of retinoblastoma, bone tumors, and adrenal carcinomas were also high in São Paulo. In Fortaleza, girls, age group 1-4, showed the highest incidence rate (41.4 per million), which is considered an exception.

Another exception occurred in Recife, also referring to girls, in the 5-9 age group, where CNS tumors displayed the highest incidence (18.6 per million).

The second study published by the International Agency for Research on Cancer (IARC) disclosed the results of PBCR from Goiania (1989-1994) and Belem (1987-1991) (Parkin et al. 1998). Leukemias were the most common cancer in both registries for both sexes. The second most common incidence for boys was lymphoma, followed by the CNS tumors. This order was inverted for girls: in the Goiania registry, the incidence rate of renal tumors, bone tumors and sarcomas were significantly higher in girls (13.6, 1.7, 13.6 per million, respectively).

The São Paulo PBCR published a paper in 2004 with incidence data from 1969 and 1997/1998. The age-adjusted incidence rate in children under 15 in the city of São Paulo was 128.5 million in males and 120.98 million in females in 1969, and 222.47 million in males and 195.03 million in females in 1997/98. The age group with the highest incidence was 0 to 4, followed by the 5-9 age group (Mirra. 2004).

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a Surveillance, Epidemiology and End Results (SEER) – National Cancer Institute Program – NCI, established in 1973, with population registries in 5 states (Connecticut, Utah, Novo Mexico, Iowa, Hawai) and 5 North American metropolitan areas (Detroit, Michigan; Atlanta, Georgia; Seattle, Washigton; São Francisco, Califórnia; Los Angeles, California), corresponding to 14% of the population of the USA.

Also in the city of São Paulo, there is a hospital-based registry located in Fundação Oncocentro de São Paulo (São Paulo Oncocenter Foundation – FOSP) whose aim is to reorganize the hospital-based cancer registry of São Paulo state, by keeping a statewide database of cancer patients. This system foresees sending data every three months and currently 63 hospitals feed the state database, 52 of which are registered as Centro de Alta Complexidade em Oncologia (High Complexity Oncology Center,CACON). From 2000 to June 2008, there were 8,768 registered cases in the pediatric age group (0-18) representing 3,2% of all cancer registered . The most common types were leukemias (25.7%), lymphomas (16.3%), and CNS tumors (12.8%) (FOSP, 2008).

The hospital based cancer registry HBCR of the Hospital do Cancer A. C. Camargo, in São Paulo, published results from 1988 and 1994 that register 322 children in 1988 and 256 children in 1994, representing 9% of all cancers registered in the hospital. Leukemias and lymphomas compose 31.5% and solid tumors to 68.5% (Ribeiro,1999).

The information published by HBCR of the Hospital Erasto Gaertner, located in Curitiba, for the period between 2000 and 2004, showed that 436 patients aged 0-19 were registered. The pediatric patients (under 15 years old) represented 2.4% of all cases admitted in the HBCR and the adolescent patients (aged 15-19) represented 1.5% of all cases. The most common neoplasms for pediatric cases were leukemias (23.1%), lymphomas (16.0%) and CNS tumors (13.1%). For adolescents, the most common were carcinomas and other malignant epithelial neoplasms (22.0%), lymphoma (20.8%), and leukemia (14.9%) (LPCC, 2007).

Between 1983 and 2005, the HBCR of the Instituto Nacional de Câncer in Rio de Janeiro observed the registration of 112,583 patients, 61,101 of which are males (54.3%) and 51,482 are females (45.7%). In the 0-19 age group, 3,199 patients were registered, representing 2.8% of the total. These correspond to 2.9% of the total number of male cases and 2.8% of female cases. From the total number of cancer case in children and adolescents, 1,745 patients were male (54.5%) and 1,454 were female (45.5%). The most common tumors for pediatric cases were classified as Group XI – Carcinomas and other malignant epithelial neoplasms (28.1%), Group I – Leukemias (15.0%), Group VIII – Malignant bone tumors (13.8%), Group II – Lymphomas and other reticuloendothelial neoplasms (10.1%), and Group IX – Soft tissue sarcomas (7.3%); representing a 74.3% of all pediatric cancer. The tumors classified as Group VI – Renal tumors represented 6.2% and as Group III – CNS and miscellaneous represented 5.8% (HBCR of Hospital do Câncer I, in INCA).

Mortality

The specific death cause is often poorly identified and medical information is often missing, generating disagreements regarding the validity of the cancer-specific mortality rates. Cancer mortality must include not only the deaths directly related to cancer, but also the treatment-related deaths (Welch, 2002). There is some evidence that treatment-related deaths are not always attributed to the cancer itself. Premature death during the first month may be attributed more to chemotherapy's toxicity than to the progression of the disease (Brown. 1993, Ray-Coquard. 2001). Sepse-related deaths of neutropenia patients during treatment are the most common cause of mortality. Other causes, such as neurological, cardiac and renal toxicity, are also frequents. In surgery specializations, death occurring 30 days after surgical proceedings is considered death from surgery; however, we must question if this definition is correct regarding oncology patients. The proportion of deaths not attributable to cancer was more elevated during the period immediately after surgery. The authors suggest that cancer-related mortality rate has been underestimated from 1 to 2%. Determining the cause of death is a complex process; however, if one propounds to determine the progress against cancer, one must include the diagnosis and treatment-related deaths. Distinguishing between deaths caused by the disease and deaths caused by the treatment is also important and must not be left out (Welch, 2002). Despite a standardization to classify the causes of death using the International Statistical Classification of Diseases and Related Health Problems (ICD), there is still some disagreement among doctors regarding the correct attribution of death causes (James 1996, Lu. 2001).

The mortality rate of childhood cancer, childhood leukemias, lymphomas, and solid tumors was shown to decline significantly since 1960 in developed regions such as North America, Central Europe, Japan and Oceania. Slower and less significant decreases were observed in regions of Eastern Europe, South America, and other less developed countries (Martos, 1993; Levi, 1992; Levi, 1995). Since 1980, the mortality rates continued to decrease, albeit displaying a less accentuated pattern (Miller, 1984; La Vecchia, 1998). Recent data describing childhood tumor mortality rates, between 1965 and 2004, were taken from national registries in the UK. Considering all ages, the mortality rates from 2000 to 2004 were less than half when compared to the 1965-1969 period. The mortality rates in children suffering from leukemia decreased significantly, especially during the first years. During this period, there was a larger decrease in children between ages 1 and 4, and less accentuated in the 10-14 age group. The mortality rates for patients suffering from central nervous system tumors went from 15.51 per million children, per year, between 1965 and 1969, to 9.93 per million children, per year, between 2000 and 2004. An important decrease was observed in the first 20 years, while the mortality rates of children suffering from neuroblastoma were stabilized in subsequent years. Among children aged 1 to 4, the mortality rates decreased considerably, but the same decrease was not observed in other ages. In children suffering from renal tumors, the mortality rates dropped from 4.91 per million children, per year, in 1965-1969, to 1.35 per million children, per year, in 1985-1989, and became constant for the remaining period. There was a reduction in the mortality rates of children suffering from retinoblastoma, hepatic tumors, soft tissue sarcomas, germ-cell tumors. The mortality rates in children suffering from bone tumors went from 2.62 per million children, per year, in 1965-1969, to 1.60 per million children, per year, in 2000-2004. Cancer was the cause of 15% of deaths in children between 1965-1969, then 21% between 2000 and 2004. The decrease in infant mortality was more accentuated than the decrease in cancer mortality (Stiller, 2007)

Survival

Various factors may interfere in the survival of pediatric cancer and one of the main factors is late diagnosis. Delay in seeking medical care may be a consequence of the precariousness of healthcare services, unawareness of both the medical and non-medical class regarding cure possibilities, and even religious barriers. Cancer diagnosis depends on the effort of the patient and his/her family in seeking medical service from the very first symptoms, as well as on the doctor's astuteness and wisdom in evaluating the possibility of cancer, establishing immediate diagnosis, and providing adequate guidance. The signs and symptoms are very unspecific and may be confused with common childhood illnesses. Unlike adult cancer, screening for pediatric cancer is exceptionally debatable. Screenings that prematurely detect neuroblastoma producing catecholamine were conducted in Japan, the United States and Europe. Results demonstrated that it was impossible to detect the more aggressive tumors in earlier stages. (Sawada, 1991; Woods, 1996; Erttmann, 1998). Early diagnosis remains a challenge for the pediatrician. There are many other factors that may influence prognosis: host factors (sex, age, race, comorbidity, social and economic factors); tumor-related factors (extension, primary site, morphology and biology); and, lastly, factors related to the healthcare system (screening, diagnosis and treatment facilities, treatment quality, and follow-up) (Black, 1998).

Survival statistics are one of the most important indicators in finding adequate care for the child suffering from cancer. In the adult population, prevention of early disease and early diagnosis are the most important weapons against cancer, placing therapy onto a second plane (Sporn, 1996). Within the infant population, both prevention and early diagnosis are extremely difficult. The therapeutic phase, therefore, has become the main weapon against cancer, undergoing tremendous progress. Survival of children suffering from malignant diseases have significantly improved in the last 30 years due to treatment improvement and centralization within specialized units (Stiller, 1988; Selby, 1996).

Population Based survival analyses data was first conducted in the United States with (SEER) in 1973. Mortality rates have significantly declined between 1975 and 1995, reaching 40%, with significant statistical cancer decrease of 2.6 percent. Later in time, a project called EUROCARE (European Cancer Registry-based Study of Survival and Care of Cancer Patients) was created based on population data

throughout Europe and is currently the most comprehensive study on pediatric cancer survival data (Coebergh,2001; Berrino, 2001). This project analyzes the incidence and survival data of 34,814 children between 1978 and 1989, encompassing 30 cancer registries in 17 European countries and comprising 45% of Europe (Magnani, 2001b). There has been a trend of decreased mortality in all countries and in all histological types. The highest survival occurred in countries where a centralized diagnosis process is under effect, where patients had access to correct treatment following a protocol (Coebergh, 2001). The highest mortality rate occurred in Romania and most Eastern European countries and the lowest rates occurred in Ireland and North European countries (Levi, 2001).

The Automated Childhood Cancer Information – ACCIS was founded by the European Union and is aimed at collecting, presenting and interpreting information about incidence and survival in children (aged 0-14) and adolescents (aged 15-19) in Europe. The ACCIS database contains information on 80 PBCR, covering around half of the 0-14 population and a quarter of the 15-19 population that inhabit the 35 participating countries. The population dataset comprise 1.3 billion person-years, with about 160 thousand new cancer cases diagnosed between 1970 and 2001 (Steliarova-Foucher, 2004). This study demonstrated that survival in the 90's in Europe in this reference group was 73%. Survival in Eastern European countries (63%) was lower than in Western Europe (75%). In children aged 0-14, survival in Western Europe was higher than in Eastern Europe for all cancer, with the exception of carcinomas (86% in the East and 94% in the West). Among adolescents (aged 15-19), survival was 73%. In Western Europe, survival was 63%, while it was 75% in Eastern Europe. In this study, substantial improvement was observed in children. In the seventies, five-year survival was 44%; in the eighties, it increased to 64% and reached 74% in the nineties. In adolescents, the survival in the seventies was 50%, increased to 63% in the eighties, and to 74% in the nineties.

In the United Kingdom, survival at all the three periods analyzed – 1954-63, 1964-73 and 1974-83 – increased significantly. In five years the survival increased from 21%, as observed in the first period (1954-63), to 49% in the last period (1974-83) (Birch, 1988).

Both population studies, SEER and EUROCARE, were recently compared in order to verify differences in childhood cancer survival between Europe and the United States. The comparison concluded that, unlike those of adult cancer, childhood survival in Western Europe are similar to those in the United States. This shows that, in both regions, there is equal access to adequate treatment for children suffering from cancer (Gatta, 2002).

The observed survival in developing countries are lower than in the developed world. There was no improvement in Cuba during 1982 or between 1988 and 1989, displaying survival results of 51.3% and 47.9%, respectively (Boschmomar, 2000). Namibia, in Southern Africa, displayed a survival of 37% from 1983 to 1988, and survivors consisted mostly of Wilms' tumor patients (76%) (Wessels, 1996). The mortality rate in Uruguay during 1992 and 1994 represents 45.3% of cancer patients (Castillo, 2001). In Brazil, the PBCR of Goiania between 1989 and 1996 presented survival and mortality rates. The mortality coefficients remained stable during this period and the 5-years survival after diagnosis was 34%, from 24% in 1989/1990 to 50% in 1993/1994 (Braga, 2000; Braga, 2002). The mortality rate was found to be stable for both sexes and among children between ages 0 to 4. However, statistically significant decreases could be observed for the 5-9 and 10-14 age group as well as for the leukemia group. The chances of global survival went from 23.6% (1989/1990) to 50.0% (1993/1994) (Braga, 2000; Braga, 2002). The Population-Based Cancer Registry (PBCR) in São Paulo also conducted a study assessing survival in children aged 0 to 14 during 1993 and 1997/1998. The survival in 5 years was 41% for all patients. There were no significant differences in accumulated survival, according to sex (male=42%, female=41%; p=0.152), age group (ages 0-4=46%, ages 5-9=38%, ages 10-14=38%, p=0.861) and time period (1993=44%, 1997/98=42%; p=0,870) (Mirra,2004).

Although many studies report information on children younger than 15, we know that, in most countries, pediatricians also care for the adolescent population. The age of 15 used to indicate the end of childhood for epidemiologic effects; therefore, most studies consider the 15-19 age group as adolescence. The age group involving adolescents is the primary interest of pediatric oncology, since nobody has known who should care for these forlorn patients. The World Health Organization (WHO) accepts the definition of adolescence as the age group of 10 to 19 (WHO, 1985). The histological types of cancer suffered by adolescents are more similar to the types that occur in children than those suffered

by adults, despite a few details that deserve special attention (Bleyer, 2002a). Progress in the observed survival in adolescents suffering from cancer was not as accentuated as in children. A possible reason is that adolescents have not been treated following cooperative studies, randomized clinical trials in a specialized institution. In the United States and Canada, only 5% of patients between ages 15 and 25 are registered in clinical trials, while 60-65% of their younger counterparts are included (Bleyer, 2002b). In two cancer registries from Ontario, Canada, 96% of children aged 0-14 were treated in pediatric oncology centers, as opposed to only 46% of teenagers (aged 15-17), a fact that could jeopardize the survival of adolescents (Greenberg 2003). Data from SEER reveal that overall 5 years survival, increased 19% in adolescents, from 1974 to 1976 and from 1989 to 1995, while in other age groups (0-4; 5-9; 10-14) the increase amounted to 31%, 34%, and 38%, respectively (Ries,2002). A recent French paper demonstrated that adolescents suffering from acute lymphoid leukemia presented higher survival if they were treated with pediatric protocols (FRALLE-93), as opposed to those treated with adult protocols (LALA-94) (Boissel, 2003).

I. Childhood and Adolescent Cancer Characteristics, According to the International Classification System of Childhood Cancer

Childhood cancer cannot be considered a simple disease, but a range of different malignancies. This type of cancer varies according to histological type, primary tumor site, ethnicity, sex, and age. The information below describes each group in the International Classification of Childhood Cancer (ICCC).

Group I: Leukemia

This group of neoplasm include the categories: I.a. Lymphoid leukemia; I.b. Acute non-lymphocytic leukemia; I.c. Chronic myeloid leukemia; I.d. Other specified leukemia; I.e. Unspecified leukemia.

Leukemia is the most common type of cancer in children under 15 in most populations, corresponding to 25-35%, with the exception of Nigeria, where it corresponds to 4.5% of cancer cases (Parkin, 1988).

Data from SEER reveal that leukemia represents 31% of all cancer cases in those under the age of 15 and 25% in those under the age of 20 (Smith,2002). Its incidence has not altered in the last 30 years and the mortality rates have presented an accentuated declining pattern, which reflects the improvement of treatment (La Vecchia, 1998; Linet, 1999).

Therapeutic progress began in the 1940s, when chemotherapy agents were shown to act effectively against leukemic blasts. Acute lymphoid leukemia is currently recognized as a disease with heterogeneous characteristics and different biological aspects. Treatment for this disease must be selected according to a standardized risk classification, such as the DNA Index, cytogenetics, precocious response to therapy, immunophenotyping, and presence in the central nervous system. The treatment for leukemia displays one of the highest success rates. Combinations of chemotherapy drugs, the addition of maintenance systems, and prophylactic treatment of central nervous system diseases significantly improved survival, which went from 40-50% during the 1970s to 70-80% in the 1990s (Miller, 1994). A number of factors were responsible for this improvement, including profound knowledge of cellular biology, which could guide the choice of drugs, support treatment, the institution's clinical experience, and protocol standardization.

In isolated specialized institutions, the survival statistics improved significant. In Recife, the overall 5 years survival went from 32% (1980 to 1989), to 63% (1997 to 2002). In the former period, 14% of patients experienced relapses and 16% abandoned treatment. In the latter, 3.3% of patients presented relapses and 0.5% abandoned treatment (Howard,2004). In Hospital de Câncer –AC Camargo in São Paulo, 5 years survival also were shown to improve, from 13% between 1975

and 1979 to 55% between 1995 and 1999. These data included all patients admitted to the hospital, including the cases that have already been treated and presented relapse of the disease (De Camargo, 2003). By using the German protocol BFM-90 and 95 in one group of Brazilian children suffering from acute lymphoid leukemia, disease-free survival in five years was 50.8 (+- 7.2%) (Laks, 2003).

The inseparable triad of social, economic and nutritional factors plays a crucial role in the prognosis of a child suffering from leukemia (Walters,1972). In Brazil Viana et al. (1994) demonstrated that malnutrition was an independent prognostic factor in children suffering from acute lymphoid leukemia. Other experiences also suggest that malnutrition has proven to be an important factor influencing survival. Lobato-Mendizabal and Ruiz-Arguelles (1989) described their experience in Mexico, where the survival in well-nourished children reached 83%, compared to 26% in malnourished children. Pedrosa et al. (2000) did not notice a relationship between survival and the child's nutritional state in a group of patients in the Northeast of Brazil. Sgarbieri et al. (1999) evaluated anthropometric data and serum levels of zinc and copper in 23 children suffering from leukemia. They noticed that the children suffering from leukemia did not present anthropometric differences compared to the control group; however, they did present low serum levels of zinc and copper. Other factors, such as prognostic value, do not seem to diverge in different populations. Cytogenetic alterations in Brazilian children are similar to those in other populations, thus not consisting a responsible factor for the different prognosis (Melo, 2002; Silva, 2002). It is not yet clear if racial factors or social/economic factors are independent prognostic factors (Coebergh,1996; Stiller et al. 2000).

In 1997, the Brazilian Ministry of Health, acting in partnership with the Banco do Brasil (Bank of Brazil), developed the Programa Criança e Vida (Child and Life Program), whose aim was to equip eight laboratories in different regions in Brazil in order to provide the diagnosis of pediatric cancer in impoverished areas. Since then, there was a clear improvement in terms of recognition and classification of leukemias in Brazil.

INCA has been actively participating by providing cancer treatment and supporting the Pediatric Oncology and Hematology Program, which offers diagnosis and research on leukemia to many Brazilian states (INCA, 1996-2008). Between 1999 and 2007, this program registered 3,395 children (ages 0-18) and their biological samples. Many research studies were born from this network, including case-control epidemiological studies. A case-control study with 202 children suffering from infant acute leukemia and 440 hospital-based controls was conducted in different Brazilian states (Bahia, Paraíba, Pernambuco, Rio de Janeiro, São Paulo, Minas Gerais, Rio Grande do Sul, Santa Catarina, and Distrito Federal). This study observed a significant association between the maternal use of hormones during pregnancy and cancer incidence (OR= 8.76 (CI 95% 2.85-26.93). The medication used during pregnancy was thus linked to the rearrangement of the MLL gene. Although the association is not significant, it may suggest that there is an interaction between maternal exposure during pregnancy and MLL translocation (dipyrone= OR 1.45 (CI 95% 0.75-2.86); metronidazole = OR 1.72; CI 95% 0.64-4.58), quinolones =OR 2.25; CI 95% 0.70-25.70) (Pombo-de-Oliveira, 2006). Increased birth weight has also shown to be associated with higher risk of infant acute leukemia (Koifman, 2008). The risk association of the role of polymorphisms on the folic acid metabolism was studied in 358 children suffering from acute leukemia (ALL and AML) and 514 healthy controls. Throughout the whole case-control examination, no association was observed between polymorphisms 677C>T and 1298A>C and risk; however, allel 1298C was found to be associated with a greater risk of leukemia in children living in impoverished regions in Brazil (Zanrosso, 2005; Ramos, 2006).

The Brazilian Cooperative Group for the Treatment of Acute Lymphoid Leukemia (Grupo Cooperativo Brasileiro para Tratamento da Leucemia Linfóide Aguda- GCBTLI) first came together in 1980 and demonstrated the existence of an improvement, from of 50% of survival in the first study (1980-1982), to 58% in the second study (1982-1995) and 70% in the third study (1985-1988) (Brandalise, 1993). The GBTLI ALL-99 study posed a therapeutic question in which patients were randomized to a maintenance therapy regime using 6MP (50mg/m daily/ MTX 25 mg/m/weekly) or to an intermittent regime using MTX

(200mg/m/EV in 6 hours every 21 days/ 6MP (100mg/m/day- 10 days). Twenty-two out of 560 registered patients showed a slow response and migrated to the high-risk treatment and 512 were analyzed. The remission rate was 95.3% and 439 (87.9%) achieved complete remission. The average observation period is 2 years. According to the maintenance regime, the event-free survival was 80% and 88% (p=0.048) for the conventional group and intermittent group, respectively. Hepatotoxicity, central nervous system toxicity, and hematological toxicity was higher for the conventional group. Despite its short period of observation, the study suggests that the intermittent regime presents a higher event-free survival with less toxicity (Brandalise, 2007).

In the United States, in 1995, 35% of childhood cancer deaths were due to leukemia. The mortality rate decreased about 50% between 1975 and 1995, with a significant statistical decrease of 3.4% a year. This reduction was observed by age group in both sexes (Ries, 1999).

It was observed a declining trend regarding mortality in Brazil between 1980 and 2002 (Ribeiro et al., 2007). According to the index of social exclusion (ISE) described by Campos et al. 2004, this decrease was more accentuated in the more developed states. Mortality rates declined in both sexes in Distrito Federal, Espirito Santo, Goiás, Minas Gerais, Paraná, Rio Grande do Sul, and São Paulo. Mortality rates increased in Alagoas, Ceará, Maranhão, Piauí, Amazonas, and Rio Grande do Norte. Significant correlation between ISE and mortality rates show there was greater decrease in mortality in states with improved socioeconomic conditions (Ribeiro, 2007).

As for children and teenagers suffering from acute nonlymphocytic leukemia or acute myeloid leukemia (AML), the progress was perceptively smaller. There was important progress in precocious mortality related to the toxicity of the treatment. Death rates decreased from 5 to 10% during the first two weeks, in the 1970s, and are now 2% (Pui, 1998). With the introduction of the German protocol BFM (Berlin-Frankfurt-Munich), survival has improved significantly. The Universidade Federal de Minas Gerais – UFMG, in a retrospective and prospective analysis of 83 children suffering from AML, treated between 1986 and 2000, demonstrated that, after introducing the German protocol, the remission rate went from 40% to 66% (p=0.11). The 5-year overall survival was 31% (Viana, 2003). In the state of Rio Grande do Sul, 532 patients were diagnosed with AML in the 1996-2000 period, 114 of whom were under the age of 18. Overall survival in 5 years was 17%. There was predominance of pro-mielocytic leukemia (M3) cases, a fact which has already been described in Latin America (Capra, 2007).

According to data from the EUROCARE project, mortality rates were reduced to 7% a year. Global survival showed perceptive improvement between 1978 and 1989 (Gatta, 2001). Prognosis was better for children in girls in the 5-9 age group. Patients from Finland, United Kingdom, Germany, The Netherlands, and Italy presented higher 1-year survival (>=65%) and the worst results were observed in Eastern European countries and Spain. After analyzing the Piedmonte registry, in Italy, researchers observed that survival slowly increased to 38% from 1990 to 1994 (Pastore, 2001b). The SEER data showed that the 5-year survival for children registered between 1985 and 1994 was 40% (Ries, 1999)

Group II: Lymphoma and reticuloendothelial neoplasms

This group comprises II.a. Hodgkin lymphoma (HL), II.b. Non-Hodgkin lymphoma (NHL), II c. Burkitt lymphoma, II.d. Miscellaneous lymphoreticular neoplasms and II.e Unspecified lymphoma. These disease consist of the third most common cancer in North-American children, after leukemias and the central nervous system tumors (Little, 1999). In developing countries, they usually are the second. (Braga, 2002).

Adenopathy is a common sign seen by pediatrician and is mostly benign. The early indication of biopsy is controversial since it is an invasive procedure that commonly requires anesthesia. In developing countries, the incidence of metastatic disease is higher. In Nicaragua, 20% of the 45 children suffering from Hodgkin's lymphoma presented metastasis at diagnosis (Baez, 1996).

The non-Hodgkin lymphomas that occur in children correspond to a heterogeneous group with various histological types, the Burkitt type being the most common. According to information obtained from SEER, incidence remains constant in the 5-14 age group, though incidence in adolescents aged 15-19 went from 10.7 million, in 1975-1979, to 16.3 million in 1990-1995 (Ries, 1999).

Progress in the treatment of children suffering from Non-Hodgkin lymphoma began with a combination of multiple chemotherapy drugs (Mott, 1981). The main progress mark can be illustrated by a series of studies conducted by the Memorial Sloan-Kettering Cancer Center in New York city, which utilized a therapeutic protocol named LSA2- L2 (Wollner, 1975, Wollner, 1976; Wollner, 1979). In Hospital do Câncer-AC Camargo in São Paulo; this protocol was used from 1975 to 1982 and 1983 to 1986 with a few modifications during the last period. The 2 years overall survival in both periods was 49.6% and 65.2%, respectively. In the second period, intermediate dose of methotrexate was added. Mortality, in the induction period, was extremely high and sepsis was four times higher than during the first period, without the use of methotrexate (De Andréa, 1988). In 1986, according to these results, the protocol was modified using the rescue with leukovorin even with intermediate dose of methotrexate. The results were encouraging. Eighty-five percent of the cases went into remission after the induction phase and 94% of these survived (De Andréa, 1990). With the addition of the drug VM-26, 38 out of 39 patients suffering from non-lymphoblastic lymphoma treated in Hospital das Clínicas, in São Paulo, went into complete remission and 36 were event-free disease. Among the non-Burkitt lymphomas, 100% were found to be event-free and among the Burkitt's lymphomas 86% (Maluf, 1994).

In Recife, located in the Northeast, analysis of 110 children suffering from Non-Hodgkin lymphoma, between 1994 and 2003, observed a 5-year overall survival of 70%. The average age was 6 years and the most common histological type was Burkitt's lymphoma. No clinical factor had a prognostic value (Pedrosa, 2007).

The decline in mortality regarding Hodgkin's lymphoma was constant in the United States, in the European Union, and in Japan (La Vecchia, 1991, Hoppe, 1994; Levi, 2002). In Eastern European countries, the decline was slow and was only observed after 1990, when chemotherapy drugs became available in these countries. This decline did not follow mortality decline in other diseases, such as cardiovascular diseases, observed in this period (Levi, 2002). The survival of children registered in EUROCARE varied from 68% in Estonia, to 96% in Germany and 100% in Slovenia. Results were similar to other countries, such as, 91% in the United States (1985-1994), 92% in Australia (1980-1989), and 90% in Canada (1985-1988) (Giles, 1995, Villeneuve, 1998; Pastore, 2001a).

In an analysis comparing the survival of children suffering from Hodgkin's lymphoma in two North American centers and one in the Brazilian Northeast (Recife), the survival of patients with favorable factors shared similar results in the three centers. However, among patients with unfavorable factors, event-free survival of Brazilian patients treated in Recife was worse than in the North American centers (60% vs. 78%; p=0.08). The survival after relapse was also inferior in the Recife center compared to the North American centers (25% vs.61%; p=0.08). The overall survival of patients with unfavorable factors was significantly inferior in Recife compared to North American centers (72% vs.91%;p=0.01). The authors suggest that a more aggressive therapy with better support treatment must be included in this group of patients (Hsu, 2007).

In an analysis of 37 children and teenagers treated in the Centro Infantil Domingos Boldrini of Campinas, in São Paulo state, between 1978 and 1988, 5-year overall survival was 78%. This study observed that 50% of patients presents with advanced stages (III/IV) and with at least one systemic symptom classified as B, which is much more frequent than other series. The histological subtypes were similar to other series (Faria et al., 1996).

Association between Burkitt lymphoma and the Epstein-Barr virus (EBV) was observed through epidemiological studies based on blood material. These studies found the viral gene in tumors originating from endemic areas. A cohort study conducted in Uganda collected approximately 32,000 blood samples of children older than 8, from 1972 to 1974. In total, 16 Burkitt lymphoma cases were confirmed (Little, 1999)

Group III: CNS and miscellaneous intracranial and intraspinal neoplasms

This group of neoplasms is classified into: III.a. Ependymoma; III.b. Astrocytoma; III.c. Primitive neuroectodermal tumors; III.d. Other gliomas; III.e. Miscellaneous intracranial and intraspinal neoplasms; and III.f. Unspecified intracranial and intraspinal neoplasms.

Around 8-15% of pediatric neoplasms are represented by this group, which makes it the most common solid tumor in the pediatric age group (Little J, 1999 e Ries,1999). In developed countries, this group represents the second the most common diagnosis group in childhood,contributing with around 19 to 27% of neoplasms. In developing countries, it represents the third most common (Little, 1999).

Its incidence is progressively increasing and survival have improved little in relation to other neoplasms (Gurney, 1999). It is unclear if the incidence is increasing or if improvements in neuro-diagnosis equipment are responsible for raising the incidence. Desmeulles et al. (1992), while examining the registries of previous cases of central nervous system tumors, concluded that 20% of tumors were not diagnosed in the absence of neuro-image techniques. This increase sparked the interest of many researchers and some authors believe that it may be related to the introduction of more precise and less invasive diagnostic techniques. Others demonstrated that, although these changes have had a real effect on the incidence, there is evidence that there are other etiological factors involved, such as the possible introduction of carcinogens.

Regarding mortality in the United States, SEER data showed a mortality decrease during periods 1982-1985 and 1986-1989 compared to period 1978-1981 (Magnani, 2001a). In 1995, around 25% of deaths by pediatric cancer in the United States were due to CNS tumors. There was a 1.1% yearly decrease for CNS and brain tumors, encompassing 23% between 1975 and 1995 (Ries, 1999). The mortality rate caused by central nervous system tumors is still the highest in children suffering from neoplasia (Bleyer, 1999). Progress obtained until today regarding the treatment of pediatric central nervous system tumors are a result of the joint collaboration of many specialties. There is still plenty of room for progress.

The mortality rates from cerebral tumors in Brazil were analyzed by Monteiro and Koifman in 2003 and there was an increase from 2.24/100 thousand to 3.35/100 thousand inhabitants, corresponding to an increase of 50% in studied period (1980-1998). These rates were more elevated in childhood compared to adolescence, then subsequently increased with age and reached higher levels in older patients. The authors suggest that this growth can be partially explained by greater accessibility to health care, particularly to image diagnosis (Monteiro, 2003)

The survival varies according to the histological type, size, and site of the tumor. For all histological types of central nervous system tumors, there was a discreet increase in the survival in periods 1975-1984 (60%) and 1985-1994 (65%) in SEER data (Ries, 1999). The data registered in EUROCARE demonstrated improvement between 1978 and 1989; no changes were observed between 1990 and 1992. There are huge variations in 5-year survival among different countries, as illustrated by the rates of 26% in Estonia and 73% in Sweden. In the United States, according to data obtained from SEER, there was some improvement between 1975 and 1994 in children over the age of 5 (Gurney, 1999). In a study conducted in Italy, in Piedmonte, improvement in observed survival between 1985 and 1989 were not confirmed in children diagnosed and treated between 1990 and 1994 (Pastore, 2001b).

A series of pediatric cerebral tumors enrolled in Faculdade de Medicina, in São Paulo, were described by Rosemberg and Fujiwara (2005). They report 1,195 cases, ages 0 to 21, between 1974 and 2003. The male sex was the most affected (68.3%), 58.7% displayed supratentorial location, 31.4% infratentorial and 9.9% spinal. The most common among these were ependymomas and schwannomas. The most common among the cerebral tumors was pilocytic astrocytoma, which occurred in 18% of

cases, followed by diffuse astrocytoma (14%), medulloblastoma (11%), and craniopharyngiomas (11%) (Rosemberg, 2005).

In a series from the Universidade Federal do Paraná (Federal University of Parana) in Brazil (1990-96), 623 in 3,318 (18.7%) biopsies of the central nervous system were pediatric patients (between 5 months and 15 years of age). Most of them displayed disease located in the posterior cavity and glial origin (277). The histological type was astrocytoma (27.9%), medulloblastoma (9.95%), ependymoma (4.97%), and glioblastoma (3.37%) (Torres, 1997).

The Instituto de Oncologia Pediatrica/GRAAC (Pediatric Oncology Institute) group associated with the Universidade Federal de São Paulo (Federal University in São Paulo) conducted a 4-year evaluation (1993-97) in which they documented 70 children/adolescents (ages 1-15), and 38 cases displayed infratentorial location. As for the histological type, the most recurrent were: 21 medulloblastoma, 15 astrocytoma, 11 germinomas. Of all cases, 75% presented neurological sequelae, 34% suffered a recurrence of the disease, and 21% did not survive (Serafim, 2001)

Group IV: Sympathetic Nervous System Tumors

This group of neoplasms fit the categories: IV.a. Neuroblastoma and ganglioneuroblastoma, and IV.b. Other sympathetic nervous system tumors. The tumors in the sympathetic nervous system are responsible for 7.8% of all cancers in children under the age of 15 (Little, 1999). In this particular group, the most common tumor afflicting the child is the neuroblastoma. In the United States, approximately 700 children and teenagers younger than 20 are diagnosed with sympathetic CNS tumor each year, 650 of which are neuroblastomas (Ries, 1999).

Survival chances of children suffering from neuroblastoma was not progressing as much as other tumors. The cure for child neuroblastoma remains a major challenge. Fifty per cent presented advanced disease at diagnosis and with survival expectations not exceeding 40%. The neuroblastoma is a worldwide challenge in performing early diagnosis with localized disease. Screening devices through catecholamine dosage were performed in Japan, in the United States and in Europe, for different groups; however, although the incidence increased of localized disease in the initial phases, the incidence of advanced stages or mortality did not decrease. Screening of the neuroblastoma was abandoned (Yamamoto, 1995; Woods, 1996; Woods, 1998; Woods, 2003). The greatest progress that occurred in neuroblastoma was the fact that it was recognized as a heterogeneous disease, as far its biological, genetic, and morphological aspects are concerned, with different clinical behavior (Brodeur, 1997).

In the United States, data registered by SEER showed that survival rates only improved in children aged 1 to 4, going from 35% (1975-84) to 55% (1985-94). For children over 4, survival remained unchanged at 40% (Ries,1999). Data from EUROCARE demonstrated that 5-year survival were 48%, presenting important differences between the countries. The worst survival was observed in Scotland (28%), Denmark (32%), and England (35%), and the best was observed in Italy (66%). The risk of death after diagnosis was reduced in 26% from period 1978-81 to period 1982-85. Regarding the indexes observed in the first period (1978-81), it remained unchanged until 1989 and once again decreased 63% between 1990 and 1992 (Spix, 2001).

In the Instituto da Criança of Hospital das Clínicas in São Paulo, which is a referral center in treating children with neuroblastoma, the use of a standardized therapeutic protocol has significantly increased in survival (Odone-Filho, 1992).

Children under the age of 15 admitted in 3 pediatric hospitals in Paraná state in the span of 11 years (1990-2000) were analyzed according to clinical characteristics and survival. It registered 125 cases, 33 of which proceeded from the Hospital das Clinicas of the Federal University of Paraná, another

33 of which proceeded from the Hospital Erasto Gaetner, and 59 of which proceeded from the Hospital Pequeno Príncipe. These three hospitals included 76% of the cases of all cancers in the state. According to the stages, 102 cases presented advanced disease (stages III/IV) and 62% were more than 2 years old at diagnosis and only 25% were younger than 1. Wich differ from the current literature that claims that most patients present the disease before they complete their first year of life. The authors suggest that there is lateness in diagnosis in this state.

Two major studies in the United States and Italy described the incidence of stage IV neuroblastoma as 45% and 42%, respectively (De Bernardi, 2003; Parise, 2006). The 5-year survival was age-dependent in patients suffering from disseminated disease; only 7% of them above 2 years old and 43% were younger. All stage I patient survived and only 17% of stage IV patients survived (Parise, 2006)

Group V: Retinoblastoma

The retinoblastoma (RB), which is an intra-ocular malignant tumor, may occur familial or sporadically.

In Europe, North America and Australia, retinoblastoma corresponds to around 2-4% of all tumors in childhood. In the United States, approximately 11% of retinoblastomas develop in the first year of life and only 3% develop in children under 16 (Little, 1999; Ries, 1999).

Its incidence has increased in the past decade, probably due to the propagation of the gene by survivors of the disease. There is some evidence indicating that retinoblastoma is more common in developing countries and in tropical regions, especially Latin America, Africa and Asia representing 10 to 15% of pediatric tumors (Magrath, 1997; Strahlandorf, 1997).

A study referring to the presence of the HPV virus in unilateral retinoblastoma with no familial history was conducted in 43 children native to the city of Campinas. The DNA of HPV type 16-35 was present in 12 cases (27.9%). Its presence was more common in differentiated tumors (63.3%) and in higher stages. Further investigation is necessary (Palazzi, 2003).

Mortality trends in Brazil regarding ocular cancer in children, aged 0-15, from 1980 to 2002, were described by Ribeiro & Antoneli (2007). They observed a constant decline in mortality in both sexes. The authors suggest that this decrease should be attributed to the improvement in treatment and survival (Ribeiro, 2007a)

The most important prognostic factor is the extension of the disease at diagnosis that is related to the late diagnosis. In developed countries, a large part of patients present intra-ocular disease and survival probability are around 95% (Donaldson, 1997). The current treatment aims to attain survival, but also drives to preserving vision and minimizing future sequelae. Data registered by SEER showed that 93% of patients were still alive after 5 years of diagnosis. The 5 years survival exceeds 90% in the EUROCARE data in most European countries. The prognosis was worse in Italy (83%) and Estonia (80%); however, these data need more investigation, since these countries present a smaller number of cases (Sant, 2001).

Erwenne and Franco (1989) assessed 153 consecutive cases of children with retinoblastoma admitted to the Hospital do Cancer-AC Camargo, in São Paulo, between 1975 and 1979. Fifty percent, of the children displayed advanced disease, in other words, extra-ocular disease. The 3-years overall survival was 28.8%, compared to 89.4%, when the disease was intra-ocular ($p<0.001$) (Erwenne, 1989).

In Hospital do Cancer-AC Camargo in São Paulo, overall survival increased from 35% (1975-79) to 91% (1995-99) (De Camargo, 2003). In a study of children with intra-ocular retinoblastoma (198 cases between 1986 and 1997), overall survival was 90%. And, in patients with metastatic disease, there was

an improvement in survival after the introduction of the chemotherapy drugs as ifosfamide/etoposide to the VCA/CDDP/VM26 scheme (Antoneli, 2003).

Group VI: Renal tumors

This group of neoplasms belong to the following categories: VI.a. Wilms tumor, rhabdoid and clear cell sarcoma; VI.b. Renal carcinoma; and VI.c. Unspecified malignant renal tumors. Renal (kidney) tumors represent 5 to 10% of cancer in childhood (Little, 1999). Among the kidney tumors affecting children, 95% are embryonic tumors called nephroblastoma, also known as Wilms' tumor. Other histological types included in this study, such as clear cell sarcoma, rhabdoid tumor, and kidney carcinomas, are rare in infancy. In the past, the incidence of Wilms' tumor (WT) was considered stable, independent of race, sex, and geographical area (Innis, 1973). Recently a geographical and temporal variation of this disease could be observed, with higher incidences in Scandinavia, Nigeria and Brazil and smaller in Japan, India and Singapore (Parkin, 1988).

Data from EUROCARE demonstrated decreased death rates during the analyzed period (1978-1992), however, this improvement only became significant after 1985 (Plesko, 2001). The same study demonstrated a 5-year survival of 83%. In the Piedmonte cancer registry in Italy, survival of children suffering from Wilms' tumor increased from 41.7%, between 1970 and 1974, to 86.7%, between 1985 and 1989, and there was later an insignificant decrease to 65.7%, between 1990 and 1994 (Pastore, 2001b). Data registered by SEER demonstrated an increase in survival from 1975 to 1984 (81% to 5-year survival) and from 1985 to 1994 (92% to 5-year survival) (Ries, 1999).

In Brazil, before 1970, in the Hospital do Cancer-AC Camargo in São Paulo, survival did not exceed 8%. After 1971, when a multidisciplinary team was formed, survival exceeded to 34%. After 1979, using a protocol based on a US NWTS, survival reached 83% (De Camargo,1987a). This experience resulted in the organization of the Brazilian Cooperative Group for the Treatment of Wilms' Tumor (GCBTTW). The GCBTTW began its studies in 1978 (De Camargo,1987b). During its first study, it registered 25% of estimated Wilms' tumor cases in Brazil (De Camargo,1991). The GCBTTW demonstrated that it is possible to organize a cooperative group in Brazil, counting on the collaboration of various practitioners who are interested in pediatric oncology. It randomly demonstrated the possibility of reducing treatment costs, using a single dose of actinomycin D. Disease-free survival in four years was similar in both therapeutic arms. Children who received treatment with a single dose of actinomycin D made 1,921 hospital visits less than those who received the predicted regime with fragmented doses of actinomycin D (De Camargo, 1994). It obtained clinical epidemiological data with characteristics that were particular to Brazilian population. The occurrence of congenital anomalies was similar to the cooperative groups NWTS and Sociedad Internacional de Oncologia Pediátrica (International Society of Pediatric Oncology - SIOP) (9.1%), the children suffering from bilateral Wilms' tumors were younger than cases of unilateral disease (37.2 and 45.9 months, respectively). Race and sex were associated to diagnosis, black girls presented more frequently advanced disease (Franco, 1991). The most important association with age was the extent of the disease. The patient with localized disease was than younger 8 years, while 10% of patients with advanced disease were between 8 and 10 years old. This data suggests that there is a diagnosis delay in older children. The average tumor weight was higher in patients who displayed tumor-related symptoms, except for hematuria and disuria. The children who presented weight loss possessed tumors which were, on average, 50% larger than those who did not present the same complaint (Franco, 1991). The case-control study conducted by Sharpe et al. in 1995 presented higher risk factors in children over 2 years in parents who used insecticide (Sharpe, 1995). The use of the medication dipyrone by

mothers during pregnancy also presented risk. In children whose diagnosis was completed before the age of 25 months, the mothers' age was more advanced (Sharpe, 1996).

The current aim of bilateral Wilms' tumor treatment, aside from maintaining high survival, is the preservation of both kidney parenchymae. In the GCBTTW, the preservation of both kidney parenchymae was 57%. Eight out of 14 patients suffering from synchronic bilateral Wilms' tumor presented a global survival of 79%. The enucleation of the tumor was performed in 6 kidneys and partial nephrectomy was performed in 10 out of 16 kidneys (Alfer, 1993). An analysis of the survival of 132 patients treated for Wilms' tumor was conducted in the Instituto Nacional de Câncer, in Rio de Janeiro, from 1990 to 2000. The 5-year overall survival was 84.6%. The probability of survival of the disease in stages I, II, III and IV were 100%, 94.2%, 83.2%, and 31.3%, respectively (Grabois, 2005).

The mortality trend in renal tumors in the state of São Paulo significantly decreased between 1980 and 2000 (0.36 per 100,000 inhabitants in 1984 to 0.09 in 1992). The average mortality rate in the period was 0.23 for the female sex and 0.21 for the male sex. From period 1980-82 to period 1998-2000, mortality from kidney cancer in girls aged 14 or younger decreased 64% in the state of São Paulo. These indexes are comparable to data from Europe and the United States (Ribeiro, 2006).

In 2001, the GCBTTW was integrated to the international group linked to the SIOP, participating in the SIOP-2001 Nephroblastoma protocol.

Group VII: Hepatic tumors

This group of neoplasms belongs to the categories: VII.a. Hepatoblastoma, VII.b. Hepatic carcinoma and VIIc. Unspecified malignant hepatic tumors.

Hepatic (liver) tumors are rare in children, and the most common is hepatoblastoma. Around 85% of these tumors occurred before the age of 5. Incidence of hepatocarcinoma involves important geographic variations according to hepatitis B virus exposure.

Incidence of hepatic tumors were distributed between 0.8 and 1.3% in Europe, Australia and the United States (Parkin, 1988) and approximately 2.5% in Japan and Thailand (Sriamporn, 1996).

In Europe, Australia and Japan, incidence rates range around 5 to 7 per million (De Nully, 1989, Stiller, 2006 and Mc Whirter, 1996). Few cancer registries have enough hepatic tumors to confidently estimate the incidence according to sex ratio (Parkin, 1988; De Nully, 1989; Kaatsch, 1995 and Stiller, 2006).

Data registered in EUROCARE demonstrated that survival of children suffering from hepatoblastoma presented an important increase from 1978 to 1989, 36% during the first period (1978-1985) and 51% during the second period (1986-1989). Age was a prognostic factor, and children over 10 presented worse survival (Moller, 2001). Data registered by SEER demonstrated a survival of 59% between 1985 and 1994 (Ries, 1999). Survival of patients suffering from hepatocarcinoma is much worse, at approximately 20% according to EUROCARE data and at 40% according to SEER data (Moller, 2001).

In 1990, an international group was formed through the support of the SIOP. Since then, therapeutic protocols were proposed which count on the participation of various Brazilian institutions (SIOPEL)

Group VIII: Malignant bone tumors

This group of neoplasms belongs to the following categories: VIII.a. Osteosarcoma; VIII.b. Chondrosarcoma; VIII.c. Ewing sarcoma, VIII.d. Other specified malignant bone tumors, and VIII.e. Unspecified malignant bone tumors. Malignant bone tumors include Ewing's tumor and osteosarcoma, which represent 5% of all cancer suffered by children (Little, 1999).

Population-based cancer registries (PBCR) suggest that the incidence of osteosarcoma is higher in the Afro-Descendant population in the United States, Italy, Brazil, Germany, and Spain (Parkin, 1988). Incidence of osteosarcoma, in the 10-14 age group, was highest in the PBCR of São Paulo (Parkin, 1993).

The initial mark of progress for patients suffering from osteosarcoma was the introduction of chemotherapy regimes based on high doses of methotrexate with surgery. The gold standard of chemotherapy was still the T10 regime introduced by Rosen et al. (1982) in the late 1970s. Recently, ifosfamide has been added, but there is no clear evidence that it contributes to higher survival. Data obtained from SEER demonstrated increased survival between 1985 and 1994 (63%), if compared to the survival in the previous period, between 1975 and 1984 (49%) (Ries, 1999). In patients afflicted with osteosarcoma, increased survival was observed in European countries when comparing periods 1978-81 and 1982-85; however, there were no improvements in subsequent periods (1986-89; 1990-92). Data from EUROCARE show a survival of 52% for osteosarcoma patients and 50% for Ewing's tumor patients. The osteosarcoma patients aged 0-4 presented the worst prognosis and the worst age group for Ewing's tumor patients was 10-14. For patients suffering from osteosarcoma, there was visible improvement in survival until 1985; after that, survival remained stable. As for patients suffering from Ewing's tumor, there was an increase in survival until 1980, after which this rate remained stable (Stiller, 2001a).

The first clinical trial for osteosarcoma in Brazil began in 1982 in the Hospital do Cancer-AC Camargo, in São Paulo. The first study employed a chemotherapy protocol that included the administration of cisplatin and intra-arterial adriamycin and resulted in an event-free survival (EFS) of 44.1%. After this experience, high doses of methotrexate were added. The second study was conducted between 1987 and 1990 and EFS was calculated at 65%. This study indicated relevant factors such as prognostic value, tumor size, necrosis extent, and surgery type (Petrilli, 1991). The third and fourth studies registered patients from 1991 to 1996 and 1996 to 1999, respectively. Five Brazilian institutions participated (Instituto de Oncologia Pediatrica - GRAACC/UNIFESP, Hospital do Cancer-AC Camargo in São Paulo, Hospital das Clinicas-FMUSP, Santa Casa de Misericórdia in São Paulo, and Hospital de Clinicas in Porto Alegre). Both of these studies were jointly analyzed; the 5-year overall survival (OS) of 209 patients was found to be 50.1%, and the event-free survival (EFS) was found to be 39%. For patients with localized, metastasis-free disease, the OS and the EFS rates were 60.5% and 45.5%, respectively. The multivariate analysis revealed that factors containing prognostic values were: metastasis at diagnosis ($p<0.0001$), degrees I and II of necrosis ($p=0.046$), and size of tumor ($p=0.0071$). Unfortunately, this number represents only 10% of estimated cases in Brazil (Petrilli, 2006).

Take an isolated experience of a Brazilian institution (Hospital de Clinicas, in Porto Alegre) that treated 50 patients between 1992 and 2000. The overall survival was 33%. Among the non-metastatic patients, it was 45% and only 2 out of 19 metastatic patients are alive and disease-free. The percentage of necrosis, presence of metastasis, and DHL levels were the main prognostic factors (Rech, 2004).

The Brazilian Cooperative Group for the Treatment Osteosarcoma actively continue their studies and are currently forming a Latin American group with institutions in Argentina and Uruguay. One of the major challenges is classifying the tumors with the worst prognosis with the initial diagnosis with the intention of initiating a more aggressive treatment from the start.

In Brazil, Dalla-Torres et al. identified three differentially expressed genes in osteosarcoma. The THBSE was highly expressed in tumor biopsies of patients with metastatic disease ($p=0.0001$), which suggests an aggressive marker. An elevated expression of SPARC was found in 51/55 (96.3%) of biopsies and was correlated with worse event-free survival ($p=0.03$) and remission-free survival ($p=0.07$). An elevated expression of SPPI was shown to correlate with better survival, which suggests a good marker. This gene is associated with inflammatory response and bone remodeling (Dalla-Torres, 2006)

Group IX: Soft-Tissue Sarcomas

This group of neoplasms belongs to the following categories: IX.a. Rhabdomyosarcoma and embryonal sarcoma; IX.b. Fibrosarcoma, neurofibrosarcoma and other fibromatous neoplasms, IX.c Kaposi sarcoma, IX.d. Other specified soft-tissue sarcomas and IX.e. Unspecified soft-tissue sarcomas.

Soft-tissue sarcomas correspond to 4-8% of all cancer in childhood (Little, 1999). They include: Soft-tissue sarcomas (STS), which most often occur in children, are rhabdomyosarcomas that originate in skeletal muscle.

A trend of increased survival, according to EUROCARE data, was observed during periods 1978-1981; 1982-1985; 1986-1989; 1990-1992. Between 1985 and 1989, the 5-year survival in Europe was 62% (Stiller, 2001b). The results varied greatly among different countries, and the lowest survival was in Slovakia and Finland (Stiller, 2001b). Data registered by SEER, in soft tissue sarcomas, showed that, during periods 1975-84 and 1985-94, there was no improvement and the 5-year survival was 71%. There was a small improvement in the survival of children suffering from rhabdomyosarcoma (RMS), from 59% to 64% in periods 1975-84 and 1985-94, respectively (Ries, 1999). The prognostic factors were age and sex. Girls presented worse survival statistics than boys and patients within the 10-14 age group presented the worst prognosis (Stiller, 2001b).

In Brazil, there is little data concerning rhabdomyosarcoma. There are accounts of experiences in isolated institutions treating rhabdomyosarcoma. In the Instituto da Criança - USP (1993), 83 patients with RMS were studied from 1978 to 1992, obtaining a disease-free survival of 42%, of which 7.69% were in stage IV; 35.11% were in stage IIIB; 68.75% were in stage IIIA; 72.75% were in stage II; and 75% were in stage I (Maluf, 1993). In the Hospital de Cancer AC Camargo the 5-year overall survival of patients with soft tissue sarcomas, treated from 1991 to 2002, was 25% for patients with metastatic disease, 57.4% for patients with advanced disease and 72% for patients with localized disease ($p<0.001$) (Rodrigues, 2003). In the Instituto Nacional de Cancer- INCA (2006), in retrospective analysis of patients with rhabdomyosarcoma treated from 1986 to 2004, the accumulated probability of overall survival and event free survival in 60 months for patients with metastatic disease (GCIV), advanced disease (GCIII), and localized disease (GCI+II) during diagnosis was 17.8%, 68.3%, and 79.6%; ($p < 0.001$) and 14.9%, 57.5%, and 69.1%; ($p < 0.001$) to event free survival, respectively. In an analysis of the late diagnosis, it was observed that the time interval between the beginning of the symptoms and the diagnosis varied between 4 and 720 days, with a median of 2.3 months and a mean of 3.8 months. The history of patients with metastasis tended to be longer than that of cases with localized disease (3 months vs. 2 months; $p=0.07$). The body mass index was below the tenth percentile in 30% of patients. Event-free survival in 60 months for all patients, as well as for those lacking metastatic disease, low weight during diagnosis, evaluated by the percentile BMI ≤ 10 and the existence of regional lymph nodes were independent prognostic factors. Tumor size, despite not being included in the multivariate model, remained one of the most important prognostic factors (Ferman, 2005; Ferman, 2006).

Group X: Germ-cell, trophoblastic and other gonadal neoplasms

This group of neoplasms belongs to the categories: X.a. Intracranial and intraspinal germ-cell tumors; X.b. Other and unspecified non-gonadal germ-cell tumors; X.c. Gonadal germ-cell tumors; X.d. Gonadal carcinomas; and X.e. Other and unspecified malignant gonadal tumors. Germ-cell tumors consist of a heterogeneous group with various locations and histological types. They are relatively rare, corresponding to 2 to 4% of all pediatric tumors (Parkin, 1988).

In the United States, according to SEER information, these tumors are more common in the white population and the male population. Survival improved from 77% to 87% in periods 1975-84 and 1985-94,

respectively. The best survival was found for patients with tumors in unspecific locations and especially in children under the age of 5. The increase observed in patients with tumors located in ovaries was the same the increase in testicles (from 82% to 93-94%) (Ries, 1999). The primary location is an important factor in the prognosis. EUROCARE data showed that patients with germ-cell tumors originating in the gonads presented better survival than patients with intracranial tumors. Survival were significantly different among countries within Europe, the lowest survival was found in Estonia (43%) and Slovakia (57%) and the most elevated was found in Germany and in the UK and Wales (85%) (Kramárová, 2001).

The Brazilian Group for treatment of germ-cell neoplasms was formed in 1991. Between 1991 and 1992, 11 patients from 4 institutions and 3 states were registered with advanced disease (stages III/IV). The protocol consisted of high doses of cisplatin and etoposide. Out of 9 cases of inoperable tumors, 6 went into complete remission after 3 chemotherapy cycles and the tumors were completely dried. All of them stayed in remission with a follow-up media of 17 months. This study demonstrated that high doses of cisplatin and etoposide are effective in controlling germ-cell neoplasms with advanced disease (Lopes et al. 1995). The experience of the Hospital do Cancer in São Paulo during 15 years (1983-97) in 106 children diagnosed with germ-cell tumor demonstrated a significant improvement in survival using the protocol of the Brazilian cooperative group (TCG-91). In the first period (83-86) the survival was 43%, in the second period (87-91) it was 54%, and in the last period (91-97) utilizing protocol TCG-91, it was 80% (p=0.07) (Lopes, 2007).

Group XI: Carcinomas and other malignant epithelial neoplasms

This group of neoplasms belongs to the following categories: XI.a. Adrenocortical carcinoma; XI.b. Thyroid carcinoma; XI.c. Nasopharyngeal carcinoma; XI.d. Malignant melanoma; XI.e. Skin carcinoma and XI.f. Other and unspecified carcinomas.

Incidence of childhood and adolescent carcinoma is rare, corresponding to 2.0% (McWhirter, 1989 and Stiller, 1994). The most recent SEER data indicate that the incidence of all carcinoma under the age of 20 corresponds to 9.2% of pediatric tumors (Ries, 1999). Thyroid carcinoma is rare in children and adolescents, but its incidence has increased perceptibly after the 1986 Chernobyl disaster (Bard, 1997). Survival in children is higher than in adults (Ries, 1999 and Storm, 2001). In the hospital-based cancer registry of the Hospital do Cancer in São Paulo, between 1988 and 1994, the carcinomas in the 0-18 age group corresponded to 6.3% of total cases, predominating in the female and white population. The elevated occurrence probably owes to the referral to a reference center for the treatment of adult and childhood cancer (Ribeiro, 1999).

Adrenocortical carcinoma is extremely rare in literature. The Manchester cancer registry documented 12 cases in 33 years (1954-1986) with an estimated 0.38 cases per million in children below the age of 15 (Birch, 1988). In the United States, the estimated incidence rate is 0.3 per million, while in France it is 0.2 (Bernstein, 1999 and Desandes, 2004). Since 1969, Brazil has reported evidence of greater incidence, since Marigo et al. noted high frequency in a series of tumors (12 out of 520 cases, or 2.3%) registered in a single institution- Santa Casa de Misericórdia in São Paulo in a period of 15 years (Marigo, 1969). More recent data from the Hospital das Clínicas, linked to the Federal University of Paraná has revealed higher frequency (7% of infant tumors) (Latronico, 2004). Laboratorial investigations of these children and their families have revealed that most of them presented the germinal mutation TP53 R337H (Ribeiro, 2001 and Latronico, 2004). This data suggests that the incidence of adrenocortical carcinoma in the South of Brazil is 12-18 times greater than that in the United States and Europe (Pianoski, 2006).

Thyroid nodules are less common in children than in adults; however, once they are present, they are most often malignant. Occurrences of thyroid carcinoma in children and teenagers below the age of 18 are relatively rare and the most common is papillary carcinoma. Prognosis in children and teenagers is more favorable compared to that in adult. Between 1961 and 2000, 38 patients aged 4-18 were treated

in the Hospital do Cancer in São Paulo; histology revealed papillary carcinoma in 29 patients, follicular variants in 4, Hurthle cell carcinoma in 1, and medullary carcinoma in 4. Ten-year overall survival was 93%, 100%, and 50% for patients with papillary, follicular, and medullary carcinomas, respectively (Kowalski, 2003).

Melanomas and skin carcinomas are rare in infancy, though incidence is increasing among teenagers. Data from 61 population-based cancer registries of 20 European countries documented an incidence of 0.7 per million children and 12.9 per million adolescents. The highest rates were described in the British Isles (De Vries, 2006). Between 1980 and 2000, the Hospital do Cancer in São Paulo registered 32 children/teenagers, 12 (37.5%) of which were under the age of 12. Five cases displayed giant congenital melanocytic nevus, 3 displayed xeroderma pigmentosa, and 1 displayed dysplastic melanocytic nevus. The most common type was the nodular variant and 43.8% were more than 4 mm wide. Five-year overall survival was 64%. Due to the rare incidence of this condition within this age group, late diagnosis is more frequent (De Sá, 2004).

Grupo XII: Other and unspecified malignant tumors

This group of neoplasms belongs to the following categories: XII.a. Other specified malignant tumors and XII.b. Other unspecified malignant tumors. In a study with the Brazilian PBCR, the percentage of poorly classified tumors varied from 0% to 56.7%. This fact may contribute to the difference in cancer incidence in the country, especially for CNS tumors (Reis, 2007)

II. Materials and Methodology

II.1 Information sources

II.1.a Cancer Registries

Cancer registries are centers that systematize collection, storage and analysis data about cancer patients. These centers should be population-based (PBRC) or hospital-based (HBCR).

Hospital-based cancer registries seek to improve patient care; develop clinically and epidemiologically based research; institutional planning; organization of a cancer information system; and contribute to specialized medical education for public health professionals. The information generated in a HBCR reflects the performance of the clinical team responsible for assisting the patient.

The main objective of population-based cancer registries (PBCR) is to assess the impact of cancer in a given population. The information produced in a population registry will be used to find the cancer incidence in a specific population in a defined time period and geographical area; therefore, to keep track of morbidity and mortality rates through incidence indicators

This publication counts on the collaboration of 20 population-based registries (PBCR) existing in Brazil. Seventeen out of 20 cancer registries are located in state capitals, one in the country's capital (Distrito Federal), and two in non-capital municipalities. The following list describes the collaborating PBCR and their respective period of consolidated information.

- PBCR Aracaju (1996-2000)
- PBCR Belém (1997-2001)
- PBCR Belo Horizonte (2000-2001)
- PBCR Campinas (1991-1995)
- PBCR Campo Grande (2000-2001)
- PBCR Cuiabá (2000-2003)
- PBCR Curitiba (1998-2002)
- PBCR Distrito Federal (1999-2002)
- PBCR Fortaleza (1998-2002)
- PBCR Goiânia (1999-2003)
- PBCR Jaú (2000-2004)
- PBCR João Pessoa (2000-2004)
- PBCR Manaus (1999-2002)
- PBCR Natal (1998-2001)
- PBCR Palmas (2000-2003)
- PBCR Porto Alegre (1998-2002)
- PBCR Recife (1997-2001)
- PBCR Salvador (1998-2002)
- PBCR São Paulo (1998-2002)
- PBCR Vitória (1997)

For all the 20 PBCR, reports were written with information on the number of new cases, absolute values and specific rates based on age group, as well crude and as age-adjusted rates. For information on the time period, the rate values refer to average values.

A comparative graph was elaborated for the main neoplasms according to the PBCR. These graphs consider the whole available period (less than 5 years) or the last five years.

Inclusion / Exclusion Criteria

All cases with confirmed cancer diagnosis were collected in a year. They included primary malignant tumors, in situ or invasive, secondary malignant tumors or methastatic; and malignant tumors of uncertain location. Neither benign tumors nor tumors of uncertain behavior were collected. For the 20 PBCR included in this publication, data collection was accomplished through an active search.

Cases were eligible when cancer diagnosis was confirmed by anatomopathological (histological and cytopathological) exams, hematological exams or peripheral blood count, surgical exploration, image, clinical exam, necropsy, or any other diagnostic method approved by the responsible physician. Another eligibility criterion is that the patient be a resident of the area covered by PBCR.

Cases identified by death certificates were compared to the registry files, and those which did not match the registry, were identified. The remaining cases were included as cases obtained exclusively from death certificates, or Death Certificate Only (DCO).

The main notifying sources of the 20 PBCR included in this publication are general and specialized, public or private, cancer hospitals, anatomical pathology laboratories, and chemotherapy and radiotherapy services. Some also include hematology services, necropsy services, homes, dermatology clinics, medical clinics, as well as information obtained from national health information systems.

Collected data

The 20 PBCR included in this publication routinely collect the following variables:

Identification variables

- patient's name
- mother's name
- number of medical record and/or examination

Demographic variables

- gender
- color of skin
- date of birth
- age at diagnosis
- occupation
- complete address

Tumor-related variables

- year of diagnosis
- primary tumor location
- morphology
- means of diagnosis
- extension of disease
- date of diagnosis
- date of death
- type of death (caused or not caused by cancer)

Classification and coding

After 1996, all PBCR employed the International Classification of Diseases for Oncology, 2nd edition - ICD-O2 except Campinas, which used the 1st edition ICD-O between 1991 and 1993 and the 2nd edition ICD-O from 1994 onward.

Some of the main diagnostic groups were thus abbreviated in tables and diagrams: "lymphomas" indicate lymphomas and reticuloendothelial neoplasms – Group II; "CNS tumors" indicate CNS and miscellaneous intracranial and intraspinal neoplasms – Group III.

Data processing

Out of the 20 PBCR included in this publication, 18 used the population-based database SisBasepop developed by INCA/MS from the data entry process to the selection of eligible cases (Aracaju, Belém, Belo Horizonte, Campinas, Campo Grande, Cuiabá, Curitiba, Distrito Federal, Fortaleza, João Pessoa, Jaú, Manaus, Natal, Palmas, Porto Alegre, Recife, Salvador, and Vitória). Two PBCR used their own system (Goiânia and São Paulo).

Both PBCR that did not use SisBasepop sent information converted into the proper classification and established format – the International Classification of Childhood Cancer – ICCC.

The 18 PBCR employing the SisBasepop counted on the system's resources. These include checking the consistency of data entry and the choice of eligible cases. The following items were verified:

- compatibility between topography and sex;
- compatibility between topography and morphology;
- compatibility between morphology and extension of disease;
- compatibility between date of birth and date of diagnosis;
- compatibility between topography and age;
- compatibility between morphology and age;
- compatibility between date of death, date of birth and date of diagnosis

The conversion of eligible cases was based on the International Classification of Childhood Cancer – ICCC, second edition.

II.1.b Mortality Information System

Mortality is the most commonly used information, due to both availability and scope. The mortality rate reflects the risk of death in a determined period in a specific population. Information on mortality, obtained through the systematic collection of information about death certificates, is simpler and more accessible for the study of a certain population's health conditions.

For this publication, death-related information were organized according to gender, age group, state (place of residence) and cause of death (malignant neoplasm according to the International Statistical Classification of Diseases and Related Health Problems (ICD).

The Ministry of Health's Mortality Information System (Sistema de Informação Sobre Mortalidade - SIM) is the source of data regarding deaths caused by cancer. Since the creation of the SIM in 1975, death certificate information became codified, organized and published in the Ministry's statistical yearbooks according to the ninth edition of the ICD. In 1996, the Portuguese translation of the 10th revision started being used in order to classify mortality data. Therefore, SIM information from 1979 to 1995 is classified according to the ninth revision (ICD-9) and from 1996 to 2005, according to the tenth (ICD-10). In order to allow comparison between the information presented, both editions had to conform to internationally advocated ICD conversion criteria.

The cause of death by cancer was classified according to the affected organ and the most common childhood neoplasms were chosen: kidney, bone, muscle, central nervous system (CNS), eye, leukemia, Hodgkin's and non-Hodgkin lymphoma, which were codified according to the ICD.

This publication selected the following malignant neoplasms:

Chart 1 – Conversion Codes from ICD-9 to ICD-10 for selected tumors

Malignant tumors	ICD-9	ICD-10
Non-Hodgkin lymphoma	200; 202	C82-C85; C96
Hodgkin's lymphoma	201	C81
Leukemias	204-208	C91-C95
Bone	170	C40-C41
Eye	190	C69
Kidney	189	C64
CNS	191-192	C70-C72
Muscle	171	C49
Other malignant tumors	140-208 (except 170-171; 189-192; 200-202; 204-208)	C00-C97 (except C40-C41; C49; C64; C69-C72; C81-C85; C91-C96)

Source: Conversion of Chapter II, Neoplasms from International Classification of Diseases, 1975 revision (9th revision) (ICD-9) and International Classification of Diseases, 9th revision, Clinical Modification, fourth edition (UDD-9-CM) 4 th ed. to Chapter II, Neoplasms International Statistical Classification of Diseases and Related Health Problems, 10 th Revision (ICD-10). Constance Percy, Surveillance Program, Division of Cancer Prevention and Control, National Cancer Institute.

It was not possible to analyze neuroblastomas due to its location diversity, which made it impossible to be categorized by the ICD.

It is also important to note that, in 1996, the Brazilian Center for Disease Classification (Centro Brasileiro para Classificação de Doenças – CBCD) disclosed recommendations specifically for brain tumors. From then on, there was an expressive increase in number of deaths (CBCD, 1996).

II.1.c Population References

Both census (1991, 1996, 2000) and intercensus (1992, 1993, 1994, 1995, 1997, 1998, 1999, 2001, 2002, 2003, 2004, 2005) population estimates used as denominators for rates calculations were obtained through Datasus and provided by the Brazilian Institute of Geography and Statistics or IBGE. Populations were classified by age group – younger than 1 year of age, ages 1 to 4, 5 to 9, 10 to 14, and 15-18.

In order to identify the population age structure in the region covered by the PBCR, a population pyramid was built based on the census population of the year 2000.

The world standard population used in this study was propounded by Segi (1960), modified by Doll et al. (1996) and used in publications of the international series Cancer Incidence in Five Continents – CI5. This population is based on a combination of age structures of developed or developing countries.

Table 1. World Standard Population

Index	Age group	Total
1	00	2,400
2	01-04	9,600
3	05-09	10,000
4	10-14	9,000
5	15-18	7,200
Total	**0-18**	**38,200**

Modified by Doll et al. (1966)
Source: IARC Scientific Publications nº 95

Population at risk

For representing incidences, a table contains population at risk, person-year by age range and for both sexes. The average annual population of each sex considers individual contribution in different study periods.

II.2 Statistical Methods

Percentage distribution

The percentage distribution denotes the relative incidence of the number of events (new cases or deaths) of a given topography in relation to the total number of cases:

$$\text{Percentage} = \frac{\text{total number of events in a specific topography}}{\text{total number of cases}} \times 100$$

Crude rate

The crude rate per million children and adolescents refers to the risk of an event (new cases or deaths). It is represented by the quotient between the total number of events and the population at risk. The following formula is used to find the crude rate:

$$\text{Crude rate} = \frac{\text{total number of an event indefined period}}{\text{population of reference for the defined period}} \times 1{,}000{,}000$$

Specific rate

The specific rate per million children and adolescents refers to the risk of an event (new cases or deaths) due to a give attribute (age, sex, marital status, economic background, etc.). It is represented by the quotient between the total number of events per given attribute and the population at risk. The most commonly used specific rate is the specific rate by age, which is calculated by the following formula:

$$\text{Specific rate} = \frac{\text{total number of events, by age group, sex and period}}{\text{population of reference, age group, sex and period}} \times 1{,}000{,}000$$

Age-adjusted rate

Adjustment of the incidence or mortality rates may eliminate (or minimize) the effect of age differences between populations (or within the same population in distinct periods) in order that regional or chronological differences cannot be attributed to differences in age structure. Age adjustment through the direct method is implemented by using a single standard population, which functions as a common group of weights for the calculation of pondered rates (so-called adjusted or standardized). The standard population of this study was the previously mentioned world standard population. The age-adjusted rate is calculated by the following formula:

$$\text{Age – adjusted rate} = \frac{\Sigma \text{ (specific rate by age) x (world s } \textit{tan} \text{ dard population age group)}}{\Sigma \text{ world s } \textit{tan} \text{ dard population}}$$

Estimated Annual Percent Change – EAPC

The mortality Estimated Annual Percent Change – EAPC is disaggregated by primary location and sex, from 1979 to 2005. This index is calculated by adjusting linear regression to the natural logarithm of rates (r), using the calendar year as the regression variable; in other words: **y = mx + b** where **y**

= Ln r and **x = calendar year**. The formula **EAPC = 100 (e^{m}-1)** tests the hypothesis that the Annual Percent Change is equal to zero, which is the equivalent of testing the hypothesis that the inclination in the equation above is equal to zero. This hypothesis is tested by using distribution **t** of **m/SE_m**, with the number of degrees of freedom equal to the number of calendar years minus two. The standard error of **m**, or **SE_m**, is achieved by the regression adjustment (Kleinbaum, 1988). This calculation assumes that the rate increases or decreases linearly each year, during the total given time interval.

III. Quality Control

There is significant concern regarding the quality of the PBCR information before disclosure. Therefore it is important to assess indicators and check the validity of PBCR before comparing them.

The following quality indicators were employed:

Percentage of Histopathological Verification (%VH)

Microscopic verification of histological, cytological and hematological exams.

The percentage of cases with microscopic verification is a positive indicator of the validity and information of the registry. However, a high percentage of this indicator may reflect the fact that the PBCR bases data collection in pathological laboratories, which may indicate a lack of completeness (undernotification).

Percentage by Death Certificate Only (%DCO)

The percentage of cases notified solely through the death certificate is a completeness index. A low percentage of cases notified by death certificate may indicate a good completeness of PBCR.

Male Index

For all types of cancer, incidence is generally larger for the male sex than for the female sex. This index is the ratio of the number of events in the male sex to the female sex.

Suggested parameters for evaluating PBCR

The suggested parameters of evaluation are: percentage of cases with confirmed histopathological diagnosis above 75% and up to 20% of diagnoses conducted only through death certificates (Curado, 2007).

An analysis of quality indicators by PBCR (Table 2) demonstrates the PBCR of Belém, Palmas and Cuiabá have not yet reached the above-mentioned parameters. It is therefore recommended that interpretation and comparison of this information is conducted with caution. It should be mentioned that the PBCR of Vitória only presented 1 year's worth of information, which therefore contains greater degree of imprecision (underestimation or overestimation).

Since this is the first publication of this kind, we chose not to exclude any registry. Table 2 describes the quality indicators per PBCR.

Table 2. Quality Indicators of Population-based Cancer Registries (PBCR)

PBCR (Period)	% Histopatological Diagnosis	M/F ratio	% DCO
Aracaju (1996-2000)	81.9	1.15	8.6
Belém (1997-2001)	73.9	1.11	29.0
Belo Horizonte (2000-2001)	77.8	1.56	20.4
Campinas (1991-1995)	90.3	1.29	2.1
Campo Grande (2000-2001)	79.3	1.12	14.9
Cuiabá (2000-2003)	64.3	1.18	10.3
Curitiba (1998-2002)	79.6	1.19	13.5
Distrito Federal (1999-2002)	83.2	1.11	4.1
Fortaleza (1998-2002)	80.1	0.93	17.6
Goiânia (1996-2000)	92.0	1.16	5.1
João Pessoa (2000-2004)	96.0	1.54	2.0
Jaú (2000-2004)	100.0	0.93	0.0
Manaus (1999-2002)	79.4	1.26	17.4
Natal (1998-2001)	79.4	1.04	11.0
Palmas (2000-2003)	50.0	-	50.0
Porto Alegre (1998-2002)	76.0	1.40	14.8
Recife (1997-2001)	85.0	1.09	7.1
Salvador (1998-2002)	93.4	1.20	**NA**
São Paulo (1998-2002)	83.7	1.20	2.6
Vitória (1997)	74.4	1.44	12.8

NA – Not Available
Death Certificates Only (DCO): up to 20%
Histopathological Verification (HV): above 75%

IV. Results and Comments

IV.1 PBCR Incidence in Brazil

What follows is the description of information on the 20 analyzed PBCR, their coverage area, the responsible team, and the infrastructure, as well as the at-risk population for the region and period. The population distribution of the region is also presented, highlighting the childhood and adolescent population.

PBCR of Aracaju/SE

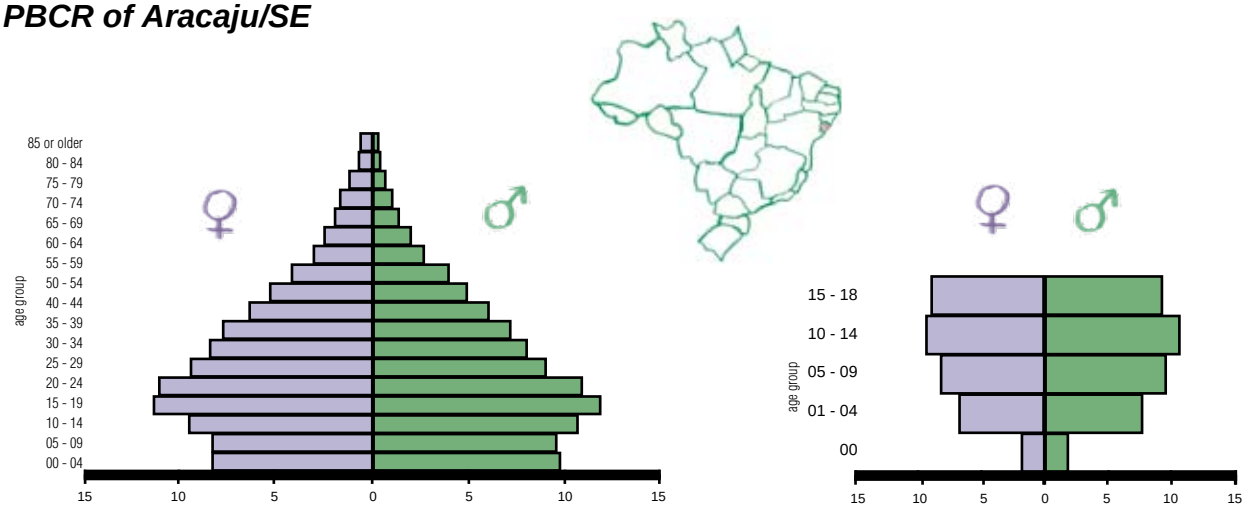

Figure 1. Population Distribution* in Aracaju

*Demographic Census of 2000 - IBGE
Sources: MP/ Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Coverage area

The area covered by Aracuju's PBCR is the city of Aracaju. This city is located in the Northeast of Brazil. Its extension area is 181.8 Km^2 and 100% of the population lives in an urban environment (520,303 inhabitants).

The city of Aracaju is 4m above sea level. The tropical climate is predominantly megathermic humid and subhumid with moderate deficiency during summer. The average annual temperature is 26ºC.

Health care facilities for cancer prevention and control

Health programs and services are mainly offered by 01 public hospital, 01 private hospital, and a few oncology clinics. There are 02 universities, one of which offers a medical program.

Infrastructure and data source

The PBCR was created in 1998 and the information gathered from 1996 to 1999 was published in the INCA website. It is located at Av. Tancredo Neves s/n Centro de Oncologia do Hospital de Urgência de Sergipe "Governador João

Alves Filho". The PBCR depends on the financial support of the Ministry of Health.

The registry's staff includes an M.D. coordinator and three registrars. The advisory board is composed of one pathologist and three oncologists.

Data is actively collected from 13 notifying sources (02 hospitals, 06 pathology labs, 01 oncology clinic, 01 chemotherapy clinic, Siscolo, SIM and APAC).

Use of information

Besides determining the incidence and geographical distribution of cancer in Aracaju, the information has been used for providing information for epidemiological studies (INCA and International Agency For Research on Cancer - IARC).

PBCR Team – Aracaju

Coordinator

Dr. Carlos Anselmo Lima

Registrars

José Erinaldo Lobo de Oliveira
Elma Santana de Oliveira
Sueli Pina Vieira

Advisory Board

Pathologist

Sônia Maria Lima Santana Marcena

Oncologist

José Geraldo Dantas Bezerra
Anselmo Mariano Fonte
Rosana Cipolotti

Table 3. Population at risk by sex and age-group from 1996 to 2000

Period: 1996 - 2000	Age-group	Male	Female
	< 1	20,502	19,475
	1-4	79,108	77,678
	5-9	106,459	104,604
	10-14	119,866	122,320
	15-18	99,954	110,307
Total	0 to 18	425,889	434,384
Annual Average	0 to 18	85,178	86,877

Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Table 4. Absolute incidence by type of cancer, crude and age-adjusted rates, per million children and adolescents, Aracaju PBCR, from 1996 to 2000*

Pediatric Tumors - Groups	Number of cases						Rates per million						
	0	1-4	5-9	10-14	15-18	0-18	0	1-4	5-9	10-14	15-18	Crude	Adjusted*
I.Leukemia	**1**	**8**	**5**	**4**	**3**	**21**	**25.01**	**51.02**	**23.69**	**16.52**	**14.27**	**24.41**	**27.18**
Ia.Lymphoid leukemia	1	7	4	3	2	17	25.01	44.65	18.95	12.39	9.51	19.76	22.46
Ib.Acute myeloid leukemia	0	1	0	1	0	2	0.00	6.38	0.00	4.13	0.00	2.32	2.58
Ic.Chronic myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ie.Unspecified and other specified leukemias	0	0	1	0	1	2	0.00	0.00	4.74	0.00	4.76	2.32	2.14
II.Lymphomas and reticuloendothelial neoplasms	**0**	**2**	**5**	**4**	**7**	**18**	**0.00**	**12.76**	**23.69**	**16.52**	**33.29**	**20.92**	**19.57**
IIa.Hodgkin lymphomas	0	0	0	3	2	5	0.00	0.00	0.00	12.39	9.51	5.81	4.71
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	2	4	1	5	12	0.00	12.76	18.95	4.13	23.78	13.95	13.62
IIc.Burkitt lymphoma	0	0	1	0	0	1	0.00	0.00	4.74	0.00	0.00	1.16	1.24
IId.Miscellaneous lymphoreticular neoplasms	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIe.Unspecified lymphomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**0**	**3**	**4**	**6**	**7**	**20**	**0.00**	**19.13**	**18.95**	**24.77**	**33.29**	**23.25**	**21.88**
IIIa.Ependymomas and choroid plexus tumor	0	0	0	0	1	1	0.00	0.00	0.00	0.00	4.76	1.16	0.90
IIIb.Astrocytomas	0	0	2	1	0	3	0.00	0.00	9.48	4.13	0.00	3.49	3.45
IIIc.Intracranial and intraspinal embryonal tumors	0	2	0	2	2	6	0.00	12.76	0.00	8.26	9.51	6.97	6.94
IIId.Other gliomas	0	0	0	0	2	2	0.00	0.00	0.00	0.00	9.51	2.32	1.79
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	0	1	2	3	2	8	0.00	6.38	9.48	12.39	9.51	9.30	8.79
IV.Neuroblastoma and other peripheral nervous cell tumors	**1**	**2**	**0**	**0**	**1**	**4**	**25.01**	**12.76**	**0.00**	**0.00**	**4.76**	**4.65**	**5.67**
IVa.Neuroblastoma and ganglioneuroblastoma	1	2	0	0	0	3	25.01	12.76	0.00	0.00	0.00	3.49	4.78
IVb.Other peripheral nervous cell tumors	0	0	0	0	1	1	0.00	0.00	0.00	0.00	4.76	1.16	0.90
V.Retinoblastoma	**0**	**2**	**2**	**0**	**0**	**4**	**0.00**	**12.76**	**9.48**	**0.00**	**0.00**	**4.65**	**5.69**
VI.Renal tumors	**0**	**5**	**2**	**1**	**0**	**8**	**0.00**	**31.89**	**9.48**	**4.13**	**0.00**	**9.30**	**11.47**
VIa.Nephroblastoma and other nonepithelial renal tumors	0	4	2	0	0	6	0.00	25.51	9.48	0.00	0.00	6.97	8.89
VIb.Renal carcinomas	0	1	0	1	0	2	0.00	6.38	0.00	4.13	0.00	2.32	2.58
VIc.Unspecified malignant renal tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VII.Hepatic tumors	**1**	**0**	**0**	**0**	**0**	**1**	**25.01**	**0.00**	**0.00**	**0.00**	**0.00**	**1.16**	**1.57**
VIIa.Hepatoblastoma	1	0	0	0	0	1	25.01	0.00	0.00	0.00	0.00	1.16	1.57
VIIb.Hepatic carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIII.Malignant bone tumors	**0**	**2**	**0**	**4**	**3**	**9**	**0.00**	**12.76**	**0.00**	**16.52**	**14.27**	**10.46**	**9.79**
VIIIa.Osteosarcomas	0	0	0	2	3	5	0.00	0.00	0.00	8.26	14.27	5.81	4.63
VIIIb.Chondrosarcomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIc.Ewing tumor and related sarcomas of bone	0	0	0	1	0	1	0.00	0.00	0.00	4.13	0.00	1.16	0.97
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	2	0	1	0	3	0.00	12.76	0.00	4.13	0.00	3.49	4.18
IX.Soft tissue and other extraosseous sarcomas	**0**	**4**	**1**	**2**	**2**	**9**	**0.00**	**25.51**	**4.74**	**8.26**	**9.51**	**10.46**	**11.39**
IXa.Rhabdomyosarcomas	0	3	0	0	0	3	0.00	19.13	0.00	0.00	0.00	3.49	4.81
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	1	0	1	0	2	0.00	6.38	0.00	4.13	0.00	2.32	2.58
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	0	1	1	1	3	0.00	0.00	4.74	4.13	4.76	3.49	3.11
IXe.Unspecified soft tissue sarcomas	0	0	0	0	1	1	0.00	0.00	0.00	0.00	4.76	1.16	0.90
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**0**	**2**	**1**	**3**	**0**	**6**	**0.00**	**12.76**	**4.74**	**12.39**	**0.00**	**6.97**	**7.36**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	1	0	1	0.00	0.00	0.00	4.13	0.00	1.16	0.97
Xb.Malignant extracranial and extragonadal germ cell tumors	0	2	0	0	0	2	0.00	12.76	0.00	0.00	0.00	2.32	3.21
Xc.Malignant gonadal germ cell tumors	0	0	1	2	0	3	0.00	0.00	4.74	8.26	0.00	3.49	3.19
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xe.Other and unspecified malignant gonadal tumors.	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XI.Other malignant epithelial neoplasms & malignant melanomas	**0**	**0**	**2**	**6**	**3**	**11**	**0.00**	**0.00**	**9.48**	**24.77**	**14.27**	**12.79**	**11.01**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIb.Thyroid carcinomas	0	0	1	3	2	6	0.00	0.00	4.74	12.39	9.51	6.97	5.95
XIc.Nasopharyngeal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XId.Malignant melanomas	0	0	0	1	0	1	0.00	0.00	0.00	4.13	0.00	1.16	0.97
XIe.Skin carcinomas	0	0	1	1	0	2	0.00	0.00	4.74	4.13	0.00	2.32	2.21
XIf.Other and unspecified carcinomas	0	0	0	1	1	2	0.00	0.00	0.00	4.13	4.76	2.32	1.87
XII.Other and unspecified malignant neoplasms	**0**	**0**	**1**	**0**	**0**	**1**	**0.00**	**0.00**	**4.74**	**0.00**	**0.00**	**1.16**	**1.24**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIIb.Other and unspecified malignant tumors	0	0	1	0	0	1	0.00	0.00	4.74	0.00	0.00	1.16	1.24
All Neoplasms	**3**	**30**	**23**	**30**	**26**	**112**	**75.04**	**191.34**	**108.97**	**123.87**	**123.66**	**130.19**	**133.82**

*World Standard Population, modified by Doll et al.(1966)

Source: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

Table 5. Absolute incidence by sex and type of cancer, crude and age-adjusted rates, per million children and adolescents, Aracaju PBCR, from 1996 to 2000*

Pediatric Tumors - Groups	Male								Female							
	Number of cases						Rates per million		Number of cases						Rates per million	
	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*
I.Leukemia	**0**	**5**	**4**	**3**	**2**	**14**	**32.87**	**35.39**	**1**	**3**	**1**	**1**	**1**	**7**	**16.11**	**19.07**
Ia.Lymphoid leukemia	0	4	3	2	1	10	23.48	25.90	1	3	1	1	1	7	16.11	19.07
Ib.Acute myeloid leukemia	0	1	0	1	0	2	4.70	5.14	0	0	0	0	0	0	0.00	0.00
Ic.Chronic myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Ie.Unspecified and other specified leukemias	0	0	1	0	1	2	4.70	4.34	0	0	0	0	0	0	0.00	0.00
II.Lymphomas and reticuloendothelial neoplasms	**0**	**0**	**3**	**3**	**5**	**11**	**25.83**	**22.70**	**0**	**2**	**2**	**1**	**2**	**7**	**16.11**	**16.82**
IIa.Hodgkin lymphomas	0	0	0	2	0	2	4.70	3.93	0	0	0	1	2	3	6.91	5.34
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	0	3	1	5	9	21.13	18.77	0	2	1	0	0	3	6.91	8.97
IIc.Burkitt lymphoma	0	0	0	0	0	0	0.00	0.00	0	0	1	0	0	1	2.30	2.50
IId.Miscellaneous lymphoreticular neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIe.Unspecified lymphomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**0**	**2**	**4**	**4**	**3**	**13**	**30.52**	**29.71**	**0**	**1**	**0**	**2**	**4**	**7**	**16.11**	**13.92**
IIIa.Ependymomas and choroid plexus tumor	0	0	0	0	0	0	0.00	0.00	0	0	0	0	1	1	2.30	1.71
IIIb.Astrocytomas	0	0	2	0	0	2	4.70	4.92	0	0	0	1	0	1	2.30	1.93
IIIc.Intracranial and intraspinal embryonal tumors	0	1	0	2	1	4	9.39	8.99	0	1	0	0	1	2	4.60	4.94
IIId.Other gliomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	2	2	4.60	3.42
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	0	1	2	2	2	7	16.44	15.80	0	0	0	1	0	1	2.30	1.93
IV.Neuroblastoma and other peripheral nervous cell tumors	**1**	**0**	**0**	**0**	**0**	**1**	**2.35**	**3.06**	**0**	**2**	**0**	**0**	**1**	**3**	**6.91**	**8.18**
IVa.Neuroblastoma and ganglioneuroblastoma	1	0	0	0	0	1	2.35	3.06	0	2	0	0	0	2	4.60	6.47
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	1	1	2.30	1.71
V.Retinoblastoma	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**2**	**2**	**0**	**0**	**4**	**9.21**	**11.48**
VI.Renal tumors	**0**	**2**	**1**	**0**	**0**	**3**	**7.04**	**8.81**	**0**	**3**	**1**	**1**	**0**	**5**	**11.51**	**14.13**
VIa.Nephroblastoma and other nonepithelial renal tumors	0	1	1	0	0	2	4.70	5.64	0	3	1	0	0	4	9.21	12.21
VIb.Renal carcinomas	0	1	0	0	0	1	2.35	3.18	0	0	0	1	0	1	2.30	1.93
VIc.Unspecified malignant renal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VII.Hepatic tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**1**	**0**	**0**	**0**	**0**	**1**	**2.30**	**3.23**
VIIa.Hepatoblastoma	0	0	0	0	0	0	0.00	0.00	1	0	0	0	0	1	2.30	3.23
VIIb.Hepatic carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIII.Malignant bone tumors	**0**	**2**	**0**	**2**	**1**	**5**	**11.74**	**12.17**	**0**	**0**	**0**	**2**	**2**	**4**	**9.21**	**7.27**
VIIIa.Osteosarcomas	0	0	0	1	1	2	4.70	3.85	0	0	0	1	2	3	6.91	5.34
VIIIb.Chondrosarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIc.Ewing tumor and related sarcomas of bone	0	0	0	1	0	1	2.35	1.97	0	0	0	0	0	0	0.00	0.00
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	2	0	0	0	2	4.70	6.35	0	0	0	1	0	1	2.30	1.93
IX.Soft tissue and other extraosseous sarcomas	**0**	**3**	**0**	**1**	**2**	**6**	**14.09**	**15.27**	**0**	**1**	**1**	**1**	**0**	**3**	**6.91**	**7.66**
IXa.Rhabdomyosarcomas	0	3	0	0	0	3	7.04	9.53	0	0	0	0	0	0	0.00	0.00
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	0	0	0	0	0	0.00	0.00	0	1	0	1	0	2	4.60	5.16
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	0	0	1	1	2	4.70	3.85	0	0	1	0	0	1	2.30	2.50
IXe.Unspecified soft tissue sarcomas	0	0	0	0	1	1	2.35	1.89	0	0	0	0	0	0	0.00	0.00
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**0**	**0**	**0**	**1**	**0**	**1**	**2.35**	**1.97**	**0**	**2**	**1**	**2**	**0**	**5**	**11.51**	**12.83**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	1	0	1	2.35	1.97	0	0	0	0	0	0	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	2	0	0	0	2	4.60	6.47
Xc.Malignant gonadal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	1	2	0	3	6.91	6.35
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xe.Other and unspecified malignant gonadal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XI.Other malignant epithelial neoplasms & malignant melanomas	**0**	**0**	**0**	**4**	**1**	**5**	**11.74**	**9.75**	**0**	**0**	**2**	**2**	**2**	**6**	**13.81**	**12.27**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIb.Thyroid carcinomas	0	0	0	2	1	3	7.04	5.82	0	0	1	1	1	3	6.91	6.14
XIc.Nasopharyngeal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XId.Malignant melanomas	0	0	0	1	0	1	2.35	1.97	0	0	0	0	0	0	0.00	0.00
XIe.Skin carcinomas	0	0	0	1	0	1	2.35	1.97	0	0	1	0	0	1	2.30	2.50
XIf.Other and unspecified carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	1	1	2	4.60	3.63
XII.Other and unspecified malignant neoplasms	**0**	**0**	**1**	**0**	**0**	**1**	**2.35**	**2.46**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIIb.Other and unspecified malignant tumors	0	0	1	0	0	1	2.35	2.46	0	0	0	0	0	0	0.00	0.00
All Neoplasms	**1**	**14**	**13**	**18**	**14**	**60**	**140.88**	**141.29**	**2**	**16**	**10**	**12**	**12**	**52**	**119.71**	**126.86**

*World Standard Populationl. modified by Doll et al.(1966)

Source: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística (IBGE)
MS/INCA/Conprev/Divisão de Informação

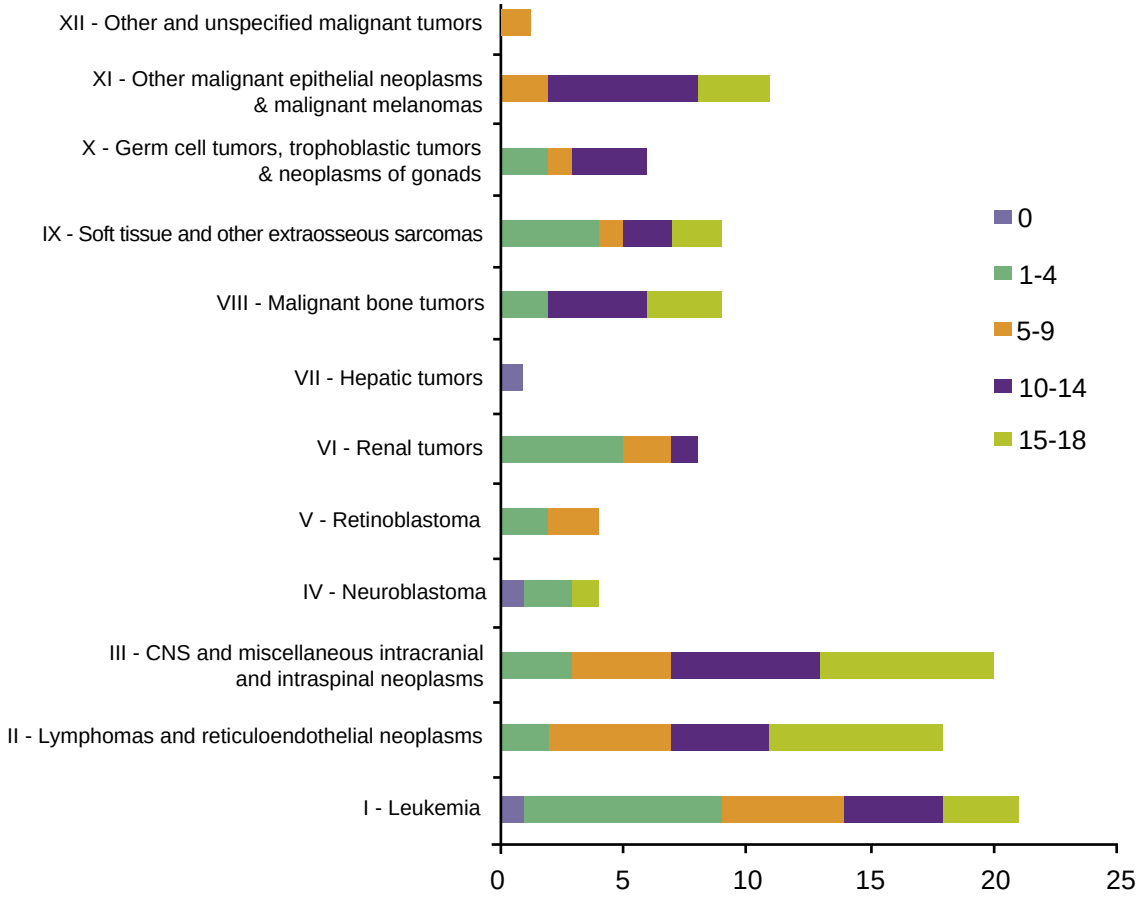

Figure 2. Number of cases by age group and type of cancer, Aracaju, 1996 to 2000

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

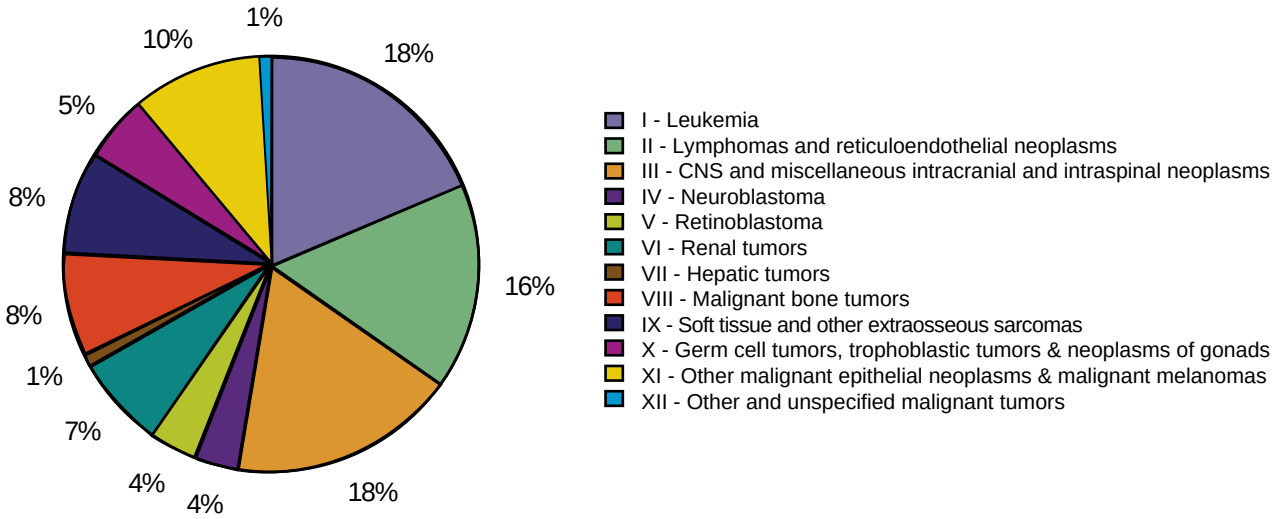

Figure 3. Distribution of incidence by type of cancer, male and female, Aracaju, 1996 to 2000

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

PBCR of Belém and Ananindeua/PA

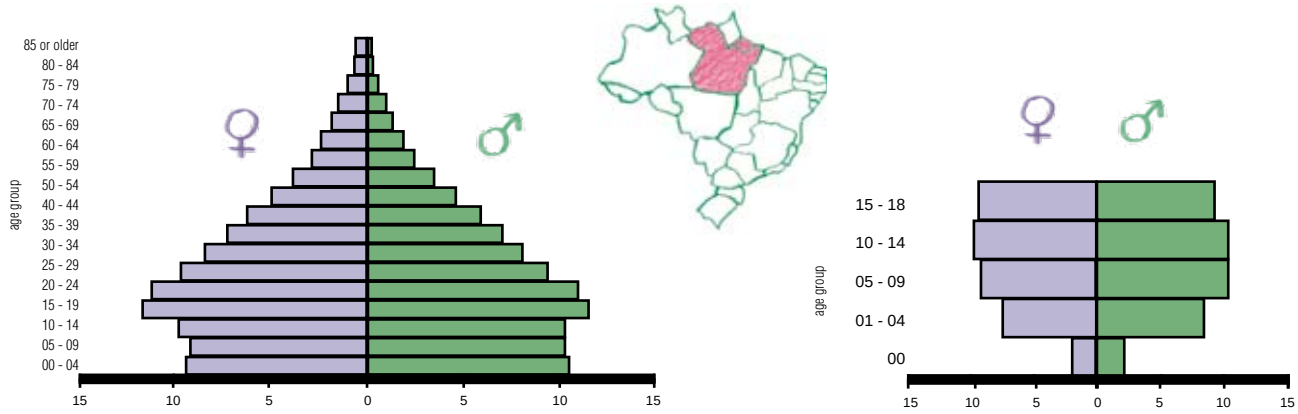

Figure 4. Population Distribution* in Belém and Ananindeua

*Demographic Census of 2000 - IBGE
Sources: MP/ Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Coverage area

Belém's PBCR covers the cities of Belém and Ananindeua, located in the Northern region of Brazil. Belém extends 1,065 Km^2. Around 98% of the population lives in urban areas (around 1,408,847 inhabitants), with an annual growth rate of 2.2% (IBGE Census 2007).

Belem stands 4m above sea level and the climate is hot-humid, with an average annual average temperature of 32 ºC.

Health care facilities for cancer prevention and control

Health programs and services are offered through 28 public or private hospitals, with 2,925 beds (0.22 for 100 inhabitants). There are also 49 health units with cancer prevention and early detection programs. Other units for cancer diagnosis and treatment include 03 radiotherapy services, 03 chemotherapy services, and 48 anatomical pathology laboratories and clinical analyses. There are also 03 public universities, two of which offer medical programs.

Infrastructure and data source

The PBCR was created in 1987 and the collection of data occurred in the same year. The former is hierarchically subordinated to the Division of Chronic-Degenerative Disease Control (Divisão de Controle de Doenças Crônico-Degenerativas) of the health department of Pará state and is located in the Hospital Ofir Loiola at Avenida Magalhães Barata, 992, 7th floor. The staff is listed below.

Data is actively collected in 24 notifying sources: 01 specialized hospital, 02 university hospitals, 09 general hospitals, 18 anatomical pathology laboratories, 01 hematology service, and 03 oncologic clinics. The death certificates are obtained from the Mortality Information System – SIM.

Use of Information

Besides determining the incidence and geographical distribution of cancer in Belém, the information has been employed to study temporal trends; access to tracking programs; data supply for epidemiological studies; and conducting classes and lectures.

PBCR team – Belém and Ananindeua

Coordinator

Lucrecia Aline Cabral Formigosa

Registrars

Risele da Silva Rocha

Collectors

Cintia Aurora Quaresma Cardoso
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Technical advisor

Antenor Madeira Neto

Table 6. Population at risk by sex and age-group from 1997 to 2001

Period: 1997-2001	Age-group	Male	Female
	< 1	81,516	78,300
	1-4	326,345	312,885
	5-9	398,635	389,038
	10-14	424,446	441,250
	15-18	364,792	406,914
Total	0 to 18	1,595,734	1,628,387
Annual Average	0 to 18	319,147	325,677

Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Table 7. Absolute incidence by type of cancer, crude and age-adjusted rates, per million children and adolescents, Belém and Ananindeua PBCR, from 1997 to 2001*

Pediatric Tumors - Groups	Number of cases						Rates per million						
	0	1-4	5-9	10-14	15-18	0-18	0	1-4	5-9	10-14	15-18	Crude	Adjusted*
I.Leukemia	**3**	**39**	**23**	**12**	**17**	**94**	**18.77**	**61.01**	**29.20**	**13.86**	**22.03**	**29.16**	**31.57**
Ia.Lymphoid leukemia	2	29	18	9	10	68	12.51	45.37	22.85	10.40	12.96	21.09	23.06
Ib.Acute myeloid leukemia	0	1	3	1	1	6	0.00	1.56	3.81	1.16	1.30	1.86	1.91
Ic.Chronic myeloproliferative diseases	0	0	1	1	1	3	0.00	0.00	1.27	1.16	1.30	0.93	0.85
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	3	1	0	2	6	0.00	4.69	1.27	0.00	2.59	1.86	2.00
Ie.Unspecified and other specified leukemias	1	6	0	1	3	11	6.26	9.39	0.00	1.16	3.89	3.41	3.76
II.Lymphomas and reticuloendothelial neoplasms	**1**	**3**	**11**	**9**	**7**	**31**	**6.26**	**4.69**	**13.97**	**10.40**	**9.07**	**9.62**	**9.39**
IIa.Hodgkin lymphomas	0	0	9	6	4	19	0.00	0.00	11.43	6.93	5.18	5.89	5.60
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	3	1	2	1	7	0.00	4.69	1.27	2.31	1.30	2.17	2.30
IIc.Burkitt lymphoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IId.Miscellaneous lymphoreticular neoplasms	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIe.Unspecified lymphomas	1	0	1	1	2	5	6.26	0.00	1.27	1.16	2.59	1.55	1.49
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**0**	**9**	**3**	**4**	**9**	**25**	**0.00**	**14.08**	**3.81**	**4.62**	**11.66**	**7.75**	**7.82**
IIIa.Ependymomas and choroid plexus tumor	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIb.Astrocytomas	0	0	2	1	1	4	0.00	0.00	2.54	1.16	1.30	1.24	1.18
IIIc.Intracranial and intraspinal embryonal tumors	0	0	0	1	0	1	0.00	0.00	0.00	1.16	0.00	0.31	0.27
IIId.Other gliomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	0	9	1	2	8	20	0.00	14.08	1.27	2.31	10.37	6.20	6.37
IV.Neuroblastoma and other peripheral nervous cell tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
IVa.Neuroblastoma and ganglioneuroblastoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
V.Retinoblastoma	**0**	**5**	**1**	**0**	**0**	**6**	**0.00**	**7.82**	**1.27**	**0.00**	**0.00**	**1.86**	**2.30**
VI.Renal tumors	**1**	**2**	**3**	**1**	**0**	**7**	**6.26**	**3.13**	**3.81**	**1.16**	**0.00**	**2.17**	**2.45**
VIa.Nephroblastoma and other nonepithelial renal tumors	0	2	3	0	0	5	0.00	3.13	3.81	0.00	0.00	1.55	1.78
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIc.Unspecified malignant renal tumors	1	0	0	1	0	2	6.26	0.00	0.00	1.16	0.00	0.62	0.67
VII.Hepatic tumors	**0**	**0**	**1**	**0**	**0**	**1**	**0.00**	**0.00**	**1.27**	**0.00**	**0.00**	**0.31**	**0.33**
VIIa.Hepatoblastoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIb.Hepatic carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	0	0	1	0	0	1	0.00	0.00	1.27	0.00	0.00	0.31	0.33
VIII.Malignant bone tumors	**0**	**0**	**2**	**6**	**9**	**17**	**0.00**	**0.00**	**2.54**	**6.93**	**11.66**	**5.27**	**4.50**
VIIIa.Osteosarcomas	0	0	0	5	4	9	0.00	0.00	0.00	5.78	5.18	2.79	2.34
VIIIb.Chondrosarcomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIc.Ewing tumor and related sarcomas of bone	0	0	1	1	1	3	0.00	0.00	1.27	1.16	1.30	0.93	0.85
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	0	1	0	4	5	0.00	0.00	1.27	0.00	5.18	1.55	1.31
IX.Soft tissue and other extraosseous sarcomas	**1**	**3**	**1**	**4**	**0**	**9**	**6.26**	**4.69**	**1.27**	**4.62**	**0.00**	**2.79**	**2.99**
IXa.Rhabdomyosarcomas	1	1	1	2	0	5	6.26	1.56	1.27	2.31	0.00	1.55	1.66
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	1	0	2	0	3	0.00	1.56	0.00	2.31	0.00	0.93	0.94
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXe.Unspecified soft tissue sarcomas	0	1	0	0	0	1	0.00	1.56	0.00	0.00	0.00	0.31	0.39
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**1**	**1**	**0**	**2**	**4**	**8**	**6.26**	**1.56**	**0.00**	**2.31**	**5.18**	**2.48**	**2.31**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	1	1	0	1	0	3	6.26	1.56	0.00	1.16	0.00	0.93	1.06
Xc.Malignant gonadal germ cell tumors	0	0	0	0	3	3	0.00	0.00	0.00	0.00	3.89	0.93	0.73
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xe.Other and unspecified malignant gonadal tumors	0	0	0	1	1	2	0.00	0.00	0.00	1.16	1.30	0.62	0.52
XI.Other malignant epithelial neoplasms & malignant melanomas	**2**	**0**	**3**	**2**	**9**	**16**	**12.51**	**0.00**	**3.81**	**2.31**	**11.66**	**4.96**	**4.53**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIb.Thyroid carcinomas	0	0	0	0	1	1	0.00	0.00	0.00	0.00	1.30	0.31	0.24
XIc.Nasopharyngeal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XId.Malignant melanomas	0	0	1	0	0	1	0.00	0.00	1.27	0.00	0.00	0.31	0.33
XIe.Skin carcinomas	0	0	2	1	2	5	0.00	0.00	2.54	1.16	2.59	1.55	1.43
XIf.Other and unspecified carcinomas	2	0	0	1	6	9	12.51	0.00	0.00	1.16	7.77	2.79	2.52
XII.Other and unspecified malignant neoplasms	**2**	**8**	**5**	**5**	**7**	**27**	**12.51**	**12.52**	**6.35**	**5.78**	**9.07**	**8.37**	**8.66**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIIb.Other and unspecified malignant tumors	2	8	5	5	7	27	12.51	12.52	6.35	5.78	9.07	8.37	8.66
All Neoplasms	**11**	**70**	**53**	**45**	**62**	**241**	**68.83**	**109.51**	**67.29**	**51.98**	**80.34**	**74.75**	**76.85**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

Table 8. Absolute incidence by sex and type of cancer, crude and age-adjusted rates, per million children and adolescents, Belém and Ananindeua PBCR, 1997-2001*

Pediatric Tumors - Groups	Male								Female							
	Number of cases						Rates per million		Number of cases						Rates per million	
	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*
I.Leukemia	**0**	**19**	**12**	**5**	**9**	**45**	**28.20**	**29.94**	**3**	**20**	**11**	**7**	**8**	**49**	**30.09**	**33.32**
Ia.Lymphoid leukemia	0	14	11	3	4	32	20.05	21.74	2	15	7	6	6	36	22.11	24.35
Ib.Acute myeloid leukemia	0	1	0	1	0	2	1.25	1.33	0	0	3	0	1	4	2.46	2.48
Ic.Chronic myeloproliferative diseases	0	0	0	1	1	2	1.25	1.07	0	0	1	0	0	1	0.61	0.67
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	2	1	0	2	5	3.13	3.23	0	1	0	0	0	1	0.61	0.80
Ie.Unspecified and other specified leukemias	0	2	0	0	2	4	2.51	2.57	1	4	0	1	1	7	4.30	5.01
II.Lymphomas and reticuloendothelial neoplasms	**0**	**2**	**8**	**6**	**5**	**21**	**13.16**	**12.71**	**1**	**1**	**3**	**3**	**2**	**10**	**6.14**	**6.15**
IIa.Hodgkin lymphomas	0	0	6	4	3	13	8.15	7.71	0	0	3	2	1	6	3.68	3.55
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	2	1	2	1	6	3.76	3.82	0	1	0	0	0	1	0.61	0.80
IIc.Burkitt lymphoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IId.Miscellaneous lymphoreticular neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIe.Unspecified lymphomas	0	0	1	0	1	2	1.25	1.17	1	0	0	1	1	3	1.84	1.80
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**0**	**4**	**1**	**2**	**6**	**13**	**8.15**	**7.95**	**0**	**5**	**2**	**2**	**3**	**12**	**7.37**	**7.82**
IIIa.Ependymomas and choroid plexus tumor	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIb.Astrocytomas	0	0	0	1	1	2	1.25	1.07	0	0	2	0	0	2	1.23	1.35
IIIc.Intracranial and intraspinal embryonal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	1	0	1	0.61	0.53
IIId.Other gliomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	0	4	1	1	5	11	6.89	6.88	0	5	0	1	3	9	5.53	5.94
IV.Neuroblastoma and other peripheral nervous cell tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
IVa.Neuroblastoma and ganglioneuroblastoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
V.Retinoblastoma	**0**	**2**	**1**	**0**	**0**	**3**	**1.88**	**2.20**	**0**	**3**	**0**	**0**	**0**	**3**	**1.84**	**2.41**
VI.Renal tumors	**1**	**0**	**2**	**0**	**0**	**3**	**1.88**	**2.08**	**0**	**2**	**1**	**1**	**0**	**4**	**2.46**	**2.81**
VIa.Nephroblastoma and other nonepithelial renal tumors	0	0	2	0	0	2	1.25	1.31	0	2	1	0	0	3	1.84	2.28
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIc.Unspecified malignant renal tumors	1	0	0	0	0	1	0.63	0.77	0	0	0	1	0	1	0.61	0.53
VII.Hepatic tumors	**0**	**0**	**1**	**0**	**0**	**1**	**0.63**	**0.66**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
VIIa.Hepatoblastoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIb.Hepatic carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	0	0	1	0	0	1	0.63	0.66	0	0	0	0	0	0	0.00	0.00
VIII.Malignant bone tumors	**0**	**0**	**0**	**3**	**5**	**8**	**5.01**	**4.25**	**0**	**0**	**2**	**3**	**4**	**9**	**5.53**	**4.80**
VIIIa.Osteosarcomas	0	0	0	2	2	4	2.51	2.14	0	0	0	3	2	5	3.07	2.53
VIIIb.Chondrosarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIc.Ewing tumor and related sarcomas of bone	0	0	0	1	1	2	1.25	1.07	0	0	1	0	0	1	0.61	0.67
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	0	0	0	2	2	1.25	1.03	0	0	1	0	2	3	1.84	1.60
IX.Soft tissue and other extraosseous sarcomas	**1**	**0**	**0**	**3**	**0**	**4**	**2.51**	**2.44**	**0**	**3**	**1**	**1**	**0**	**5**	**3.07**	**3.62**
IXa.Rhabdomyosarcomas	1	0	0	1	0	2	1.25	1.33	0	1	1	1	0	3	1.84	2.01
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	0	0	2	0	2	1.25	1.11	0	1	0	0	0	1	0.61	0.80
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXe.Unspecified soft tissue sarcomas	0	0	0	0	0	0	0.00	0.00	0	1	0	0	0	1	0.61	0.80
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**1**	**0**	**0**	**1**	**2**	**4**	**2.51**	**2.36**	**0**	**1**	**0**	**1**	**2**	**4**	**2.46**	**2.26**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	1	0	0	1	0	2	1.25	1.33	0	1	0	0	0	1	0.61	0.80
Xc.Malignant gonadal germ cell tumors	0	0	0	0	2	2	1.25	1.03	0	0	0	0	1	1	0.61	0.46
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xe.Other and unspecified malignant gonadal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	1	1	2	1.23	1.00
XI.Other malignant epithelial neoplasms & malignant melanomas	**1**	**0**	**1**	**2**	**4**	**8**	**5.01**	**4.60**	**1**	**0**	**2**	**0**	**5**	**8**	**4.91**	**4.46**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIb.Thyroid carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	1	1	0.61	0.46
XIc.Nasopharyngeal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XId.Malignant melanomas	0	0	0	0	0	0	0.00	0.00	0	0	1	0	0	1	0.61	0.67
XIe.Skin carcinomas	0	0	1	1	0	2	1.25	1.21	0	0	1	0	2	3	1.84	1.60
XIf.Other and unspecified carcinomas	1	0	0	1	4	6	3.76	3.39	1	0	0	0	2	3	1.84	1.73
XII.Other and unspecified malignant neoplasms	**0**	**7**	**2**	**4**	**4**	**17**	**10.65**	**10.99**	**2**	**1**	**3**	**1**	**3**	**10**	**6.14**	**6.35**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIIb.Other and unspecified malignant tumors	0	7	2	4	4	17	10.65	10.99	2	1	3	1	3	10	6.14	6.35
All Neoplasms	**4**	**34**	**28**	**26**	**35**	**127**	**79.59**	**80.17**	**7**	**36**	**25**	**19**	**27**	**114**	**70.01**	**74.01**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

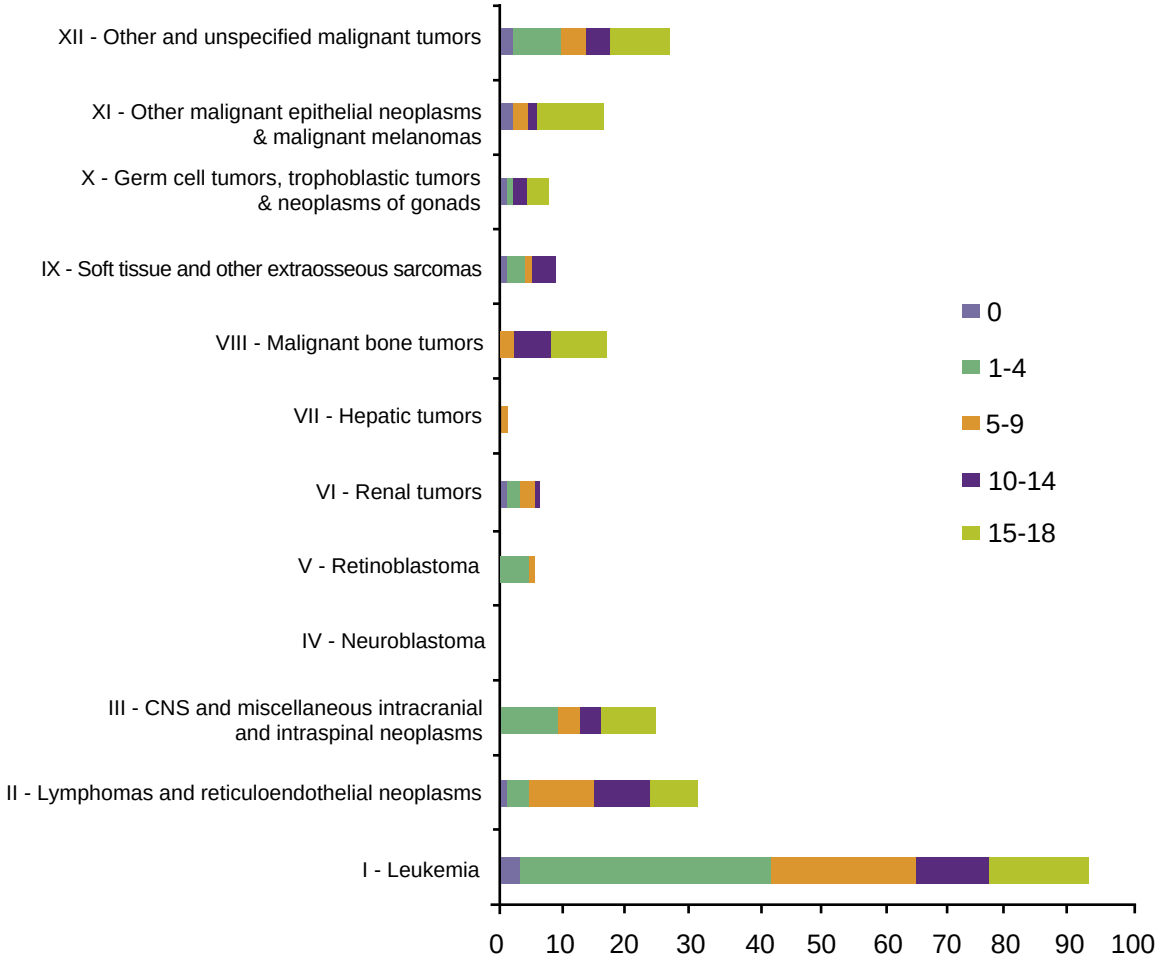

Figure 5. Number of cases by age group and type of cancer, Belém and Ananindeua, 1997 to 2001

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

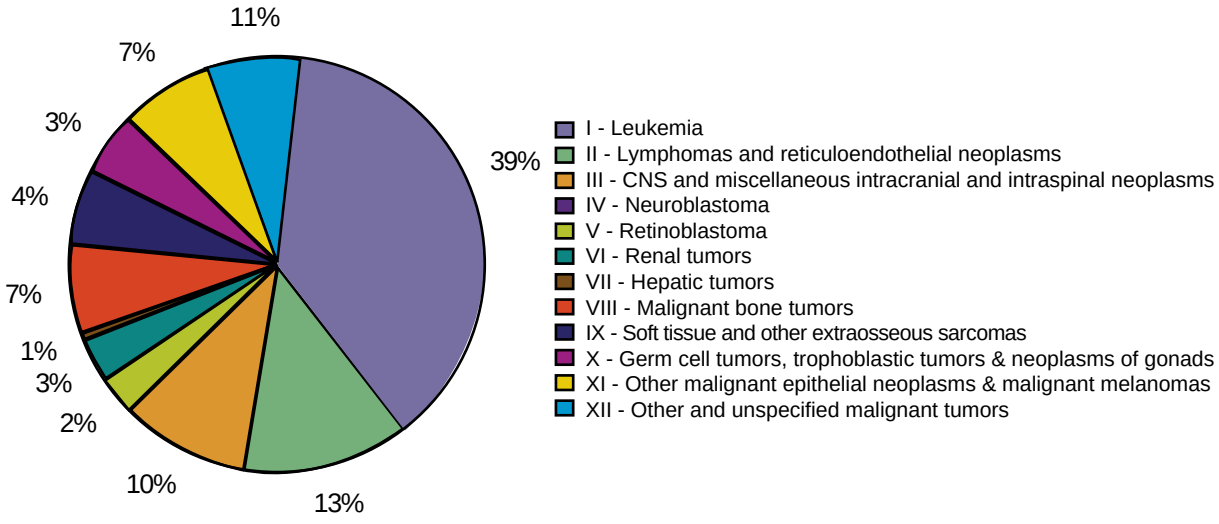

Figure 6. Incidence distribution by type of pediatric cancer, Belém and Ananindeua, 1997 to 2001

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

PBCR of Belo Horizonte/MG

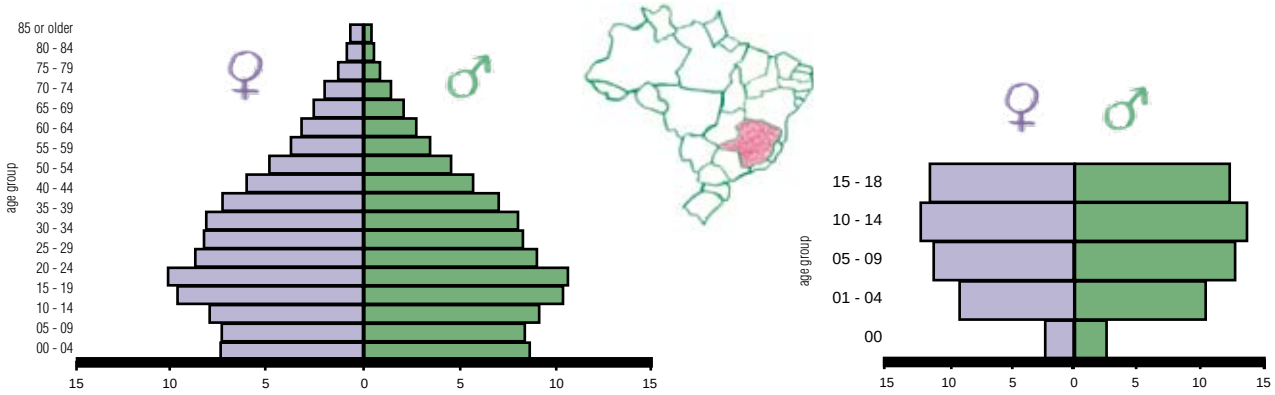

Figure 7. Population Distribution of Belo Horizonte

*Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Coverage area

Belo Horizonte's PBCR covers the city of Belo Horizonte, located in the Southeastern region of Brazil.

The capital city of Minas Gerais state extends 330.93 Km² and 100% of the population dwells in urban areas (2,238,526 inhabitants), with an annual growth rate of 1.7%. The hilly city of Belo Horizonte stands 858m above sea level and the climate is temperate, with an average annual temperature at 21ºC.

Health care facilities for cancer prevention and control

Health programs and services are offered by 60 public or private hospitals containing 10,606 hospital beds, or 4.7 hospital beds per 1000 inhabitants. Cancer diagnosis and treatment units (hospitals or isolated services) include: 4 units offering radiotherapy and chemotherapy services; 1 offering radiotherapy services only; 8 offering chemotherapy services only; 21 units containing anatomical pathology laboratories; 4 universities offering medical programs.

Infrastructure and data source

The PBCR was created in 2001 by the health department of Minas Gerais, although data collection started in 2000. The registry depends on the financial support of the State Program for Cancer Assessment and Vigilance (Instituto Nacional de Câncer/ Health Ministry).

The PBCR personnel and advisory board are listed below.

Data collection actively occurs in 31 notifying sources: 1 specialized hospital, 1 university hospital, 8 general hospitals, 19 anatomical pathology labs, and 2 information systems. The cause of death statements are taken from the Mortality Information System – SIM.

Use of information

Besides determining the incidence and geographical distribution of cancer in Belo Horizonte, the information has been used to study temporal trends; access to tracking programs; data supply for epidemiological studies and for administering classes and lectures.

PBCR team – Belo Horizonte

Coordinator/Epidemiologist
Berenice Navarro Antoniazzi

Oncologist
Maria Nunes Álvares

Statisticians
Anna Carolina Lustosa Lima
Enrico Antonio Colosimo
Renato Azeredo Teixeira
Thays Aparecida Leão D'Alessandro

Cancer Registrars/supervisors:

Field supervisors
Giselle Cristina Navarro Antoniazzi (2002)
Fabrício Guimarães Santos Resende (2003)

Computer and typing supervisors
Davidysson Abreu Alvarenga
Ronaldo Antônio de Abreu Júnior
Arthur Alves de Souza Netto

Cancer Registrars from research field
Gilcéa Aparecida Martinho (2001)
Leonardo Moreira Lemos (2002)
Anita Aquino Fernandes (2002-2003)
Adriana Kelly da Silva
Carla Cristiana de Souza
Luciano Maia Matarelli
Luís Gustavo de Aquino Tavares
Karina Elizabeth Evangelista
Keila Gomes Ribeiro

Operational and technical support
Ângela Maria do Amparo (2002)

Advisory board
(Health State Department-MG Resolution n. 623, march 10, 2001)

Epidemiologists
Berenice Navarro Antoniazzi (President)
Márcia Faria Morais Silva

Oncologist
Maria Nunes Álvares

Pathologists
Celso Pedro Tafuri
Roberto Junqueira Alvarenga

Statistician
Enrico Antonio Colosimo

Table 9. Population at risk by sex and age-group from 2000 to 2001

Period: 2000 - 2001	Age-group	Male	Female
	< 1	36,272	35,046
	1-4	145,629	141,365
	5-9	177,568	174,277
	10-14	191,786	190,035
	15-18	171,614	176,939
Total	0 to 18	722,869	717,662
Annual Average	0 to 18	361,435	358,831

Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Table 10. Absolute incidence by type of cancer, crude and age-adjusted rates, per million children and adolescents, Belo Horizonte PBCR, 2000-2001*

Pediatric Tumors - Groups	Number of cases						Rates per million						
	0	1-4	5-9	10-14	15-18	0-18	0	1-4	5-9	10-14	15-18	Crude	Adjusted*
I.Leukemia	**4**	**15**	**13**	**15**	**10**	**57**	**56.09**	**52.27**	**36.95**	**39.29**	**28.69**	**39.57**	**40.99**
Ia.Lymphoid leukemia	4	12	9	12	2	39	56.09	41.81	25.58	31.43	5.74	27.07	29.21
Ib.Acute myeloid leukemia	0	0	2	3	6	11	0.00	0.00	5.68	7.86	17.21	7.64	6.58
Ic.Chronic myeloproliferative diseases	0	0	1	0	2	3	0.00	0.00	2.84	0.00	5.74	2.08	1.83
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	1	0	0	1	0.00	0.00	2.84	0.00	0.00	0.69	0.74
Ie.Unspecified and other specified leukemias	0	3	0	0	0	3	0.00	10.45	0.00	0.00	0.00	2.08	2.63
II.Lymphomas and reticuloendothelial neoplasms	**0**	**7**	**6**	**15**	**17**	**45**	**0.00**	**24.39**	**17.05**	**39.29**	**48.77**	**31.24**	**29.04**
IIa.Hodgkin lymphomas	0	1	3	8	11	23	0.00	3.48	8.53	20.95	31.56	15.97	13.99
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	4	2	6	5	17	0.00	13.94	5.68	15.71	14.35	11.80	11.40
IIc.Burkitt lymphoma	0	2	0	1	1	4	0.00	6.97	0.00	2.62	2.87	2.78	2.91
IId.Miscellaneous lymphoreticular neoplasms	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIe.Unspecified lymphomas	0	0	1	0	0	1	0.00	0.00	2.84	0.00	0.00	0.69	0.74
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**2**	**6**	**8**	**10**	**4**	**30**	**28.04**	**20.91**	**22.74**	**26.19**	**11.48**	**20.83**	**21.30**
IIIa.Ependymomas and choroid plexus tumor	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIb.Astrocytomas	0	1	1	4	0	6	0.00	3.48	2.84	10.48	0.00	4.17	4.09
IIIc.Intracranial and intraspinal embryonal tumors	0	1	1	1	0	3	0.00	3.48	2.84	2.62	0.00	2.08	2.24
IIId.Other gliomas	0	0	2	3	0	5	0.00	0.00	5.68	7.86	0.00	3.47	3.34
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	1	0	0	1	0.00	0.00	2.84	0.00	0.00	0.69	0.74
IIIf.Unspecified intracranial and intraspinal neoplasms	2	4	3	2	4	15	28.04	13.94	8.53	5.24	11.48	10.41	10.89
IV.Neuroblastoma and other peripheral nervous cell tumors	**1**	**5**	**0**	**0**	**0**	**6**	**14.02**	**17.42**	**0.00**	**0.00**	**0.00**	**4.17**	**5.26**
IVa.Neuroblastoma and ganglioneuroblastoma	1	5	0	0	0	6	14.02	17.42	0.00	0.00	0.00	4.17	5.26
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
V.Retinoblastoma	**0**	**1**	**1**	**0**	**0**	**2**	**0.00**	**3.48**	**2.84**	**0.00**	**0.00**	**1.39**	**1.62**
VI.Renal tumors	**1**	**11**	**4**	**0**	**0**	**16**	**14.02**	**38.33**	**11.37**	**0.00**	**0.00**	**11.11**	**13.49**
VIa.Nephroblastoma and other nonepithelial renal tumors	1	10	4	0	0	15	14.02	34.84	11.37	0.00	0.00	10.41	12.61
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIc.Unspecified malignant renal tumors	0	1	0	0	0	1	0.00	3.48	0.00	0.00	0.00	0.69	0.88
VII.Hepatic tumors	**0**	**2**	**0**	**0**	**1**	**3**	**0.00**	**6.97**	**0.00**	**0.00**	**2.87**	**2.08**	**2.29**
VIIa.Hepatoblastoma	0	2	0	0	0	2	0.00	6.97	0.00	0.00	0.00	1.39	1.75
VIIb.Hepatic carcinomas	0	0	0	0	1	1	0.00	0.00	0.00	0.00	2.87	0.69	0.54
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIII.Malignant bone tumors	**0**	**0**	**2**	**7**	**11**	**20**	**0.00**	**0.00**	**5.68**	**18.33**	**31.56**	**13.88**	**11.76**
VIIIa.Osteosarcomas	0	0	1	5	7	13	0.00	0.00	2.84	13.10	20.08	9.02	7.61
VIIIb.Chondrosarcomas	0	0	0	0	1	1	0.00	0.00	0.00	0.00	2.87	0.69	0.54
VIIIc.Ewing tumor and related sarcomas of bone	0	0	1	1	0	2	0.00	0.00	2.84	2.62	0.00	1.39	1.36
VIIId.Other specified malignant bone tumors	0	0	0	0	1	1	0.00	0.00	0.00	0.00	2.87	0.69	0.54
VIIIe.Unspecified malignant bone tumors	0	0	0	1	2	3	0.00	0.00	0.00	2.62	5.74	2.08	1.70
IX.Soft tissue and other extraosseous sarcomas	**0**	**2**	**3**	**4**	**4**	**13**	**0.00**	**6.97**	**8.53**	**10.48**	**11.48**	**9.02**	**8.61**
IXa.Rhabdomyosarcomas	0	1	3	1	0	5	0.00	3.48	8.53	2.62	0.00	3.47	3.72
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	0	0	1	0	1	0.00	0.00	0.00	2.62	0.00	0.69	0.62
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	1	0	1	2	4	0.00	3.48	0.00	2.62	5.74	2.78	2.57
IXe.Unspecified soft tissue sarcomas	0	0	0	1	2	3	0.00	0.00	0.00	2.62	5.74	2.08	1.70
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**0**	**1**	**1**	**3**	**5**	**10**	**0.00**	**3.48**	**2.84**	**7.86**	**14.35**	**6.94**	**6.17**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	1	0	1	0.00	0.00	0.00	2.62	0.00	0.69	0.62
Xb.Malignant extracranial and extragonadal germ cell tumors	0	1	0	1	1	3	0.00	3.48	0.00	2.62	2.87	2.08	2.03
Xc.Malignant gonadal germ cell tumors	0	0	0	1	2	3	0.00	0.00	0.00	2.62	5.74	2.08	1.70
Xd.Gonadal carcinomas	0	0	0	0	1	1	0.00	0.00	0.00	0.00	2.87	0.69	0.54
Xe.Other and unspecified malignant gonadal tumors	0	0	1	0	1	2	0.00	0.00	2.84	0.00	2.87	1.39	1.28
XI.Other malignant epithelial neoplasms & malignant melanomas	**0**	**0**	**2**	**5**	**11**	**18**	**0.00**	**0.00**	**5.68**	**13.10**	**31.56**	**12.50**	**10.52**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIb.Thyroid carcinomas	0	0	0	0	1	1	0.00	0.00	0.00	0.00	2.87	0.69	0.54
XIc.Nasopharyngeal carcinomas	0	0	0	1	2	3	0.00	0.00	0.00	2.62	5.74	2.08	1.70
XId.Malignant melanomas	0	0	0	0	1	1	0.00	0.00	0.00	0.00	2.87	0.69	0.54
XIe.Skin carcinomas	0	0	0	0	2	2	0.00	0.00	0.00	0.00	5.74	1.39	1.08
XIf.Other and unspecified carcinomas	0	0	2	4	5	11	0.00	0.00	5.68	10.48	14.35	7.64	6.66
XII.Other and unspecified malignant neoplasms	**1**	**0**	**2**	**2**	**0**	**5**	**14.02**	**0.00**	**5.68**	**5.24**	**0.00**	**3.47**	**3.60**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIIb.Other and unspecified malignant tumors	1	0	2	2	0	5	14.02	0.00	5.68	5.24	0.00	3.47	3.60
All Neoplasms	**9**	**50**	**42**	**61**	**63**	**225**	**126.20**	**174.22**	**119.37**	**159.76**	**180.75**	**156.19**	**154.67**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

Table 11. Absolute incidence by sex and type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Belo Horizonte, 2000 to 2001*

Pediatric Tumors - Groups	Male								Female							
	Number of cases						Rates per million		Number of cases						Rates per million	
	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*
I.Leukemia	**3**	**7**	**10**	**9**	**7**	**36**	**49.80**	**50.76**	**1**	**8**	**3**	**6**	**3**	**21**	**29.26**	**31.16**
Ia.Lymphoid leukemia	3	6	7	7	1	24	33.20	35.57	1	6	2	5	1	15	20.90	22.73
Ib.Acute myeloid leukemia	0	0	1	2	5	8	11.07	9.42	0	0	1	1	1	3	4.18	3.81
Ic.Chronic myeloproliferative diseases	0	0	1	0	1	2	2.77	2.57	0	0	0	0	1	1	1.39	1.07
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	1	0	0	1	1.38	1.47	0	0	0	0	0	0	0.00	0.00
Ie.Unspecified and other specified leukemias	0	1	0	0	0	1	1.38	1.73	0	2	0	0	0	2	2.79	3.56
II.Lymphomas and reticuloendothelial neoplasms	**0**	**5**	**5**	**13**	**11**	**34**	**47.03**	**44.05**	**0**	**2**	**1**	**2**	**6**	**11**	**15.33**	**13.93**
IIa.Hodgkin lymphomas	0	0	3	8	6	17	23.52	20.84	0	1	0	0	5	6	8.36	7.10
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	4	1	4	4	13	17.98	17.68	0	0	1	2	1	4	5.57	5.05
IIc.Burkitt lymphoma	0	1	0	1	1	3	4.15	4.05	0	1	0	0	0	1	1.39	1.78
IId.Miscellaneous lymphoreticular neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIe.Unspecified lymphomas	0	0	1	0	0	1	1.38	1.47	0	0	0	0	0	0	0.00	0.00
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**1**	**4**	**5**	**7**	**0**	**17**	**23.52**	**24.61**	**1**	**2**	**3**	**2**	**4**	**12**	**16.72**	**16.59**
IIIa.Ependymomas and choroid plexus tumor	0	1	1	2	0	4	5.53	5.66	0	0	0	0	0	0	0.00	0.00
IIIb.Astrocytomas	0	0	0	0	0	0	0.00	0.00	0	0	0	1	0	1	1.39	1.24
IIIc.Intracranial and intraspinal embryonal tumors	0	1	1	1	0	3	4.15	4.43	0	0	0	0	0	0	0.00	0.00
IIId.Other gliomas	0	0	0	2	0	2	2.77	2.46	0	0	2	1	0	3	4.18	4.24
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	1	0	0	1	1.38	1.47	0	0	0	0	0	0	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	1	2	2	2	0	7	9.68	10.59	1	2	1	0	4	8	11.15	11.11
IV.Neuroblastoma and other peripheral nervous cell tumors	**1**	**1**	**0**	**0**	**0**	**2**	**2.77**	**3.46**	**0**	**4**	**0**	**0**	**0**	**4**	**5.57**	**7.11**
IVa.Neuroblastoma and ganglioneuroblastoma	1	1	0	0	0	2	2.77	3.46	0	4	0	0	0	4	5.57	7.11
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
V.Retinoblastoma	**0**	**0**	**1**	**0**	**0**	**1**	**1.38**	**1.47**	**0**	**1**	**0**	**0**	**0**	**1**	**1.39**	**1.78**
VI.Renal tumors	**1**	**4**	**1**	**0**	**0**	**6**	**8.30**	**10.11**	**0**	**7**	**3**	**0**	**0**	**10**	**13.93**	**16.95**
VIa.Nephroblastoma and other nonepithelial renal tumors	1	3	1	0	0	5	6.92	8.38	0	7	3	0	0	10	13.93	16.95
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIc.Unspecified malignant renal tumors	0	1	0	0	0	1	1.38	1.73	0	0	0	0	0	0	0.00	0.00
VII.Hepatic tumors	**0**	**2**	**0**	**0**	**0**	**2**	**2.77**	**3.45**	**0**	**0**	**0**	**0**	**1**	**1**	**1.39**	**1.07**
VIIa.Hepatoblastoma	0	2	0	0	0	2	2.77	3.45	0	0	0	0	0	0	0.00	0.00
VIIb.Hepatic carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	1	1	1.39	1.07
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIII.Malignant bone tumors	**0**	**0**	**1**	**3**	**9**	**13**	**17.98**	**15.04**	**0**	**0**	**1**	**4**	**2**	**7**	**9.75**	**8.59**
VIIIa.Osteosarcomas	0	0	0	1	7	8	11.07	8.92	0	0	1	4	0	5	6.97	6.46
VIIIb.Chondrosarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	1	1	1.39	1.07
VIIIc.Ewing tumor and related sarcomas of bone	0	0	1	1	0	2	2.77	2.70	0	0	0	0	0	0	0.00	0.00
VIIId.Other specified malignant bone tumors	0	0	0	0	1	1	1.38	1.10	0	0	0	0	0	0	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	0	0	1	1	2	2.77	2.33	0	0	0	0	1	1	1.39	1.07
IX.Soft tissue and other extraosseous sarcomas	**0**	**2**	**1**	**4**	**2**	**9**	**12.45**	**12.04**	**0**	**0**	**2**	**0**	**2**	**4**	**5.57**	**5.13**
IXa.Rhabdomyosarcomas	0	1	1	1	0	3	4.15	4.43	0	0	2	0	0	2	2.79	3.00
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	0	0	1	0	1	1.38	1.23	0	0	0	0	0	0	0.00	0.00
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	1	0	1	0	2	2.77	2.95	0	0	0	0	2	2	2.79	2.13
IXe.Unspecified soft tissue sarcomas	0	0	0	1	2	3	4.15	3.43	0	0	0	0	0	0	0.00	0.00
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**0**	**0**	**0**	**3**	**4**	**7**	**9.68**	**8.08**	**0**	**1**	**1**	**0**	**1**	**3**	**4.18**	**4.35**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	1	0	1	1.38	1.23	0	0	0	0	0	0	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	0	0	0	1	0	1	1.38	1.23	0	1	0	0	1	2	2.79	2.84
Xc.Malignant gonadal germ cell tumors	0	0	0	1	2	3	4.15	3.43	0	0	0	0	0	0	0.00	0.00
Xd.Gonadal carcinomas	0	0	0	0	1	1	1.38	1.10	0	0	0	0	0	0	0.00	0.00
Xe.Other and unspecified malignant gonadal tumors	0	0	0	0	1	1	1.38	1.10	0	0	1	0	0	1	1.39	1.50
XI.Other malignant epithelial neoplasms & malignant melanomas	**0**	**0**	**1**	**2**	**5**	**8**	**11.07**	**9.42**	**0**	**0**	**1**	**3**	**6**	**10**	**13.93**	**11.61**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIb.Thyroid carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	1	1	1.39	1.07
XIc.Nasopharyngeal carcinomas	0	0	0	1	2	3	4.15	3.43	0	0	0	0	0	0	0.00	0.00
XId.Malignant melanomas	0	0	0	0	1	1	1.38	1.10	0	0	0	0	0	0	0.00	0.00
XIe.Skin carcinomas	0	0	0	0	2	2	2.77	2.20	0	0	0	0	0	0	0.00	0.00
XIf.Other and unspecified carcinomas	0	0	1	1	0	2	2.77	2.70	0	0	1	3	5	9	12.54	10.55
XII.Other and unspecified malignant neoplasms	**0**	**0**	**1**	**1**	**0**	**2**	**2.77**	**2.70**	**1**	**0**	**1**	**1**	**0**	**3**	**4.18**	**4.53**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIIb.Other and unspecified malignant tumors	0	0	1	1	0	2	2.77	2.70	1	0	1	1	0	3	4.18	4.53
All Neoplasms	**6**	**25**	**26**	**42**	**38**	**137**	**189.52**	**185.20**	**3**	**25**	**16**	**18**	**25**	**87**	**121.23**	**122.80**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

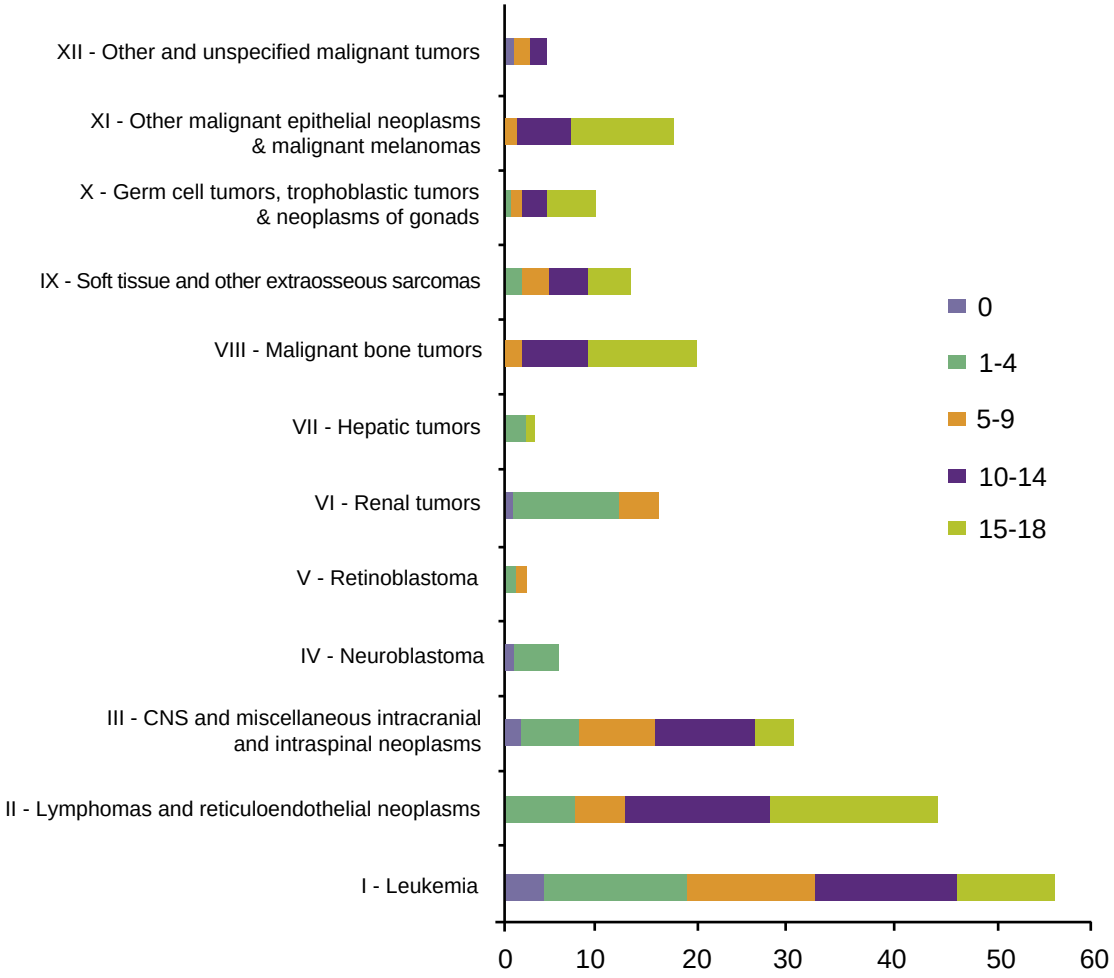

Figure 8. Number of cases by type of childhood cancer, by age group, Belo Horizonte, 2000 a 2001

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

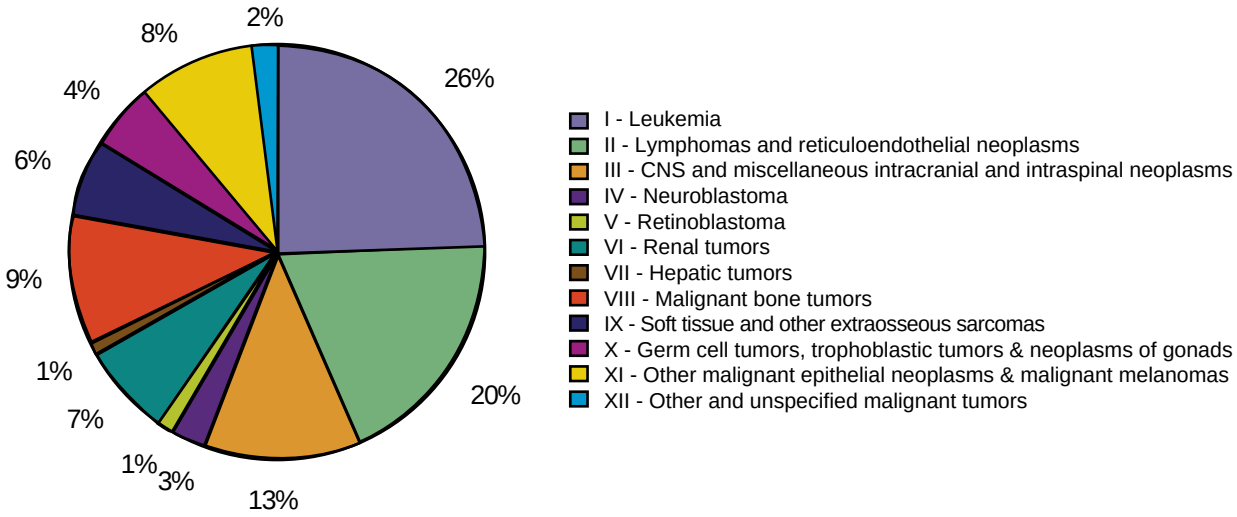

Figure 9. Percentage distribution of incidence by type of childhood cancer, Belo Horizonte, 2000 to 2001

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

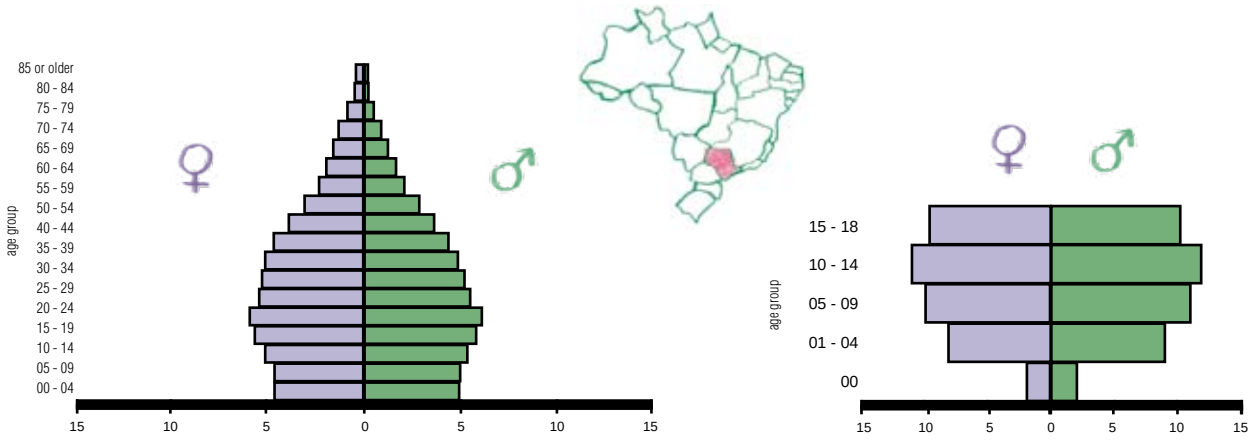

Figure 10. Population Distribution of Campinas

*Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Coverage area

The Campinas-SP PBCR covers the municipality of Campinas, located in the state of São Paulo, within the Southeast region of Brazil. Campinas-SP extends an area of 795.69 km² and has a population of 1,065,127 (98.7 % of the population, approximately 1,051,072 inhabitants, reside in urban areas), and the annual growth rate is 1.43%. Campinas-SP is located 680m above sea level and its mesothermal climate comprises hot summers and an average annual temperature of 20.7ºC

Health care facilities for cancer prevention and control

The city of Campinas-SP boasts a network of 26 modern public or private hospitals, with a total number of 2,674 hospital beds (2.98 per 100 inhabitants). The Dr. Boldrini Children's Center located in Campinas-SP is a reference for childhood cancer treatment in Latin America. Campinas has three universities with two medical schools. Other facilities in cancer diagnosis and treatment include: six radiotherapy services, seven chemotherapy services, 12 ultrasound services, 16 clinical pathology services, and 13 radiology services, among others.

Infrastructure and data source

The PBCR-Campinas-SP has existed since 1991 but was only instituted in 1992, by municipal legislation (n. 6986, May 11, 1992). Its headquarters are in the Department of Preventive and Social Medicine, Medical Science Department, State University of Campinas-SP. The PBCR-Campinas-SP does not have a permanent budget and there is active data collection. There are two coordinators – medical doctors, a permanent cancer registrars, and a temporary cancer registrars. The advisory board is composed of an epidemiologist, a statistician, a medical pathologist, four medical oncologists, a radiotherapist, and a cancer registry coordinator.

Data collection actively occurs in 40 notifying sources: one specialized hospital, 02 university hospitals, 19 general hospitals, 16 anatomical pathology laboratories, 01 hematology service, 10 oncology clinics, 06 radiotherapy services, 07 chemotherapy services, among others. The death certificates are obtained from the bank of death cases in Campinas-SP compiled by the City Government of Campinas-SP.

Use of Information

Estimating the incidence and geographical distribution of cancer cases in Campinas every year; Studying temporal trends; conducting survival analyses; evaluating the access to tracking programs; georeferencing information on cancer, through spatial analysis of cases in the geographical area of Campinas; employing data in epidemiological studies, publications, dissertations, theses, scientific journals, classes, and lectures, among others.

PBCR team – Campinas

Coordinators

Prof. Djalma de Carvalho Moreira Filho
Prof. Dr. Nazira Mahayri

Registrars

Sônia Pereira Ramos
Ana Maria Baldin Gabetto

Advisory board

Prof. Dr. José Vassalo
Prof. Dr. Luiz Carlos Zeferino
Prof. Dr. Cármino Antônio de Souza
Prof. Dr. Vitória Régia Pereira Pinheiro
Prof. Dr. Simone dos Santos Aguiar
Prof. Dr. Djalma de Carvalho Moreira Filho
Prof. Dr. Carlos R. Monti
Prof. Dr. Antônio Roberto Batista
Eduardo Luiz Hoehne

Table 12. Population at risk by sex and age-group from 1991 to 1995

Period: 1991 - 1995	Age-group	Male	Female
	< 1	39,142	36,903
	1-4	164,056	156,983
	5-9	216,327	209,359
	10-14	219,723	212,950
	15-18	157,108	158,334
Total	0 to 18	796,356	774,529
Annual Average	0 to 18	159,271	154,906

Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Table 13. Absolute incidence by type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Campinas, 1991 to 1995*

Pediatric Tumors - Groups	Number of cases						Rates per million						
	0	1-4	5-9	10-14	15-18	0-18	0	1-4	5-9	10-14	15-18	Crude	Adjusted*
I.Leukemia	**3**	**21**	**16**	**8**	**5**	**53**	**39.45**	**65.41**	**37.59**	**18.49**	**15.85**	**33.74**	**36.10**
Ia.Lymphoid leukemia	2	16	9	2	3	32	26.30	49.84	21.14	4.62	9.51	20.37	22.59
Ib.Acute myeloid leukemia	1	1	4	5	1	12	13.15	3.11	9.40	11.56	3.17	7.64	7.39
Ic.Chronic myeloproliferative diseases	0	3	0	1	0	4	0.00	9.34	0.00	2.31	0.00	2.55	2.89
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	2	0	1	3	0.00	0.00	4.70	0.00	3.17	1.91	1.83
Ie.Unspecified and other specified leukemias	0	1	1	0	0	2	0.00	3.11	2.35	0.00	0.00	1.27	1.40
II.Lymphomas and reticuloendothelial neoplasms	**3**	**5**	**4**	**7**	**6**	**25**	**39.45**	**15.57**	**9.40**	**16.18**	**19.02**	**15.91**	**16.25**
IIa.Hodgkin lymphomas	0	2	1	3	1	7	0.00	6.23	2.35	6.93	3.17	4.46	4.41
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	3	1	1	2	5	12	39.45	3.11	2.35	4.62	15.85	7.64	7.95
IIc.Burkitt lymphoma	0	2	1	2	0	5	0.00	6.23	2.35	4.62	0.00	3.18	3.27
IId.Miscellaneous lymphoreticular neoplasms	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIe.Unspecified lymphomas	0	0	1	0	0	1	0.00	0.00	2.35	0.00	0.00	0.64	0.61
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**2**	**10**	**8**	**10**	**3**	**33**	**26.30**	**31.15**	**18.79**	**23.11**	**9.51**	**21.01**	**21.64**
IIIa.Ependymomas and choroid plexus tumor	0	3	0	0	0	3	0.00	9.34	0.00	0.00	0.00	1.91	2.35
IIIb.Astrocytomas	1	3	3	8	3	18	13.15	9.34	7.05	18.49	9.51	11.46	11.17
IIIc.Intracranial and intraspinal embryonal tumors	0	1	1	1	0	3	0.00	3.11	2.35	2.31	0.00	1.91	1.94
IIId.Other gliomas	0	0	1	0	0	1	0.00	0.00	2.35	0.00	0.00	0.64	0.61
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	1	0	0	1	0.00	0.00	2.35	0.00	0.00	0.64	0.61
IIIf.Unspecified intracranial and intraspinal neoplasms	1	3	2	1	0	7	13.15	9.34	4.70	2.31	0.00	4.46	4.95
IV.Neuroblastoma and other peripheral nervous cell tumors	**2**	**3**	**1**	**0**	**0**	**6**	**26.30**	**9.34**	**2.35**	**0.00**	**0.00**	**3.82**	**4.62**
IVa.Neuroblastoma and ganglioneuroblastoma	2	3	1	0	0	6	26.30	9.34	2.35	0.00	0.00	3.82	4.62
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
V.Retinoblastoma	**2**	**5**	**1**	**0**	**0**	**8**	**26.30**	**15.57**	**2.35**	**0.00**	**0.00**	**5.09**	**6.18**
VI.Renal tumors	**3**	**6**	**1**	**0**	**0**	**10**	**39.45**	**18.69**	**2.35**	**0.00**	**0.00**	**6.37**	**7.79**
VIa.Nephroblastoma and other nonepithelial renal tumors	3	6	1	0	0	10	39.45	18.69	2.35	0.00	0.00	6.37	7.79
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIc.Unspecified malignant renal tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VII.Hepatic tumors	**0**	**0**	**2**	**0**	**0**	**2**	**0.00**	**0.00**	**4.70**	**0.00**	**0.00**	**1.27**	**1.23**
VIIa.Hepatoblastoma	0	0	2	0	0	2	0.00	0.00	4.70	0.00	0.00	1.27	1.23
VIIb.Hepatic carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIII.Malignant bone tumors	**0**	**0**	**1**	**6**	**5**	**12**	**0.00**	**0.00**	**2.35**	**13.87**	**15.85**	**7.64**	**6.87**
VIIIa.Osteosarcomas	0	0	1	2	5	8	0.00	0.00	2.35	4.62	15.85	5.09	4.69
VIIIb.Chondrosarcomas	0	0	0	2	0	2	0.00	0.00	0.00	4.62	0.00	1.27	1.09
VIIIc.Ewing tumor and related sarcomas of bone	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIId.Other specified malignant bone tumors	0	0	0	1	0	1	0.00	0.00	0.00	2.31	0.00	0.64	0.54
VIIIe.Unspecified malignant bone tumors	0	0	0	1	0	1	0.00	0.00	0.00	2.31	0.00	0.64	0.54
IX.Soft tissue and other extraosseous sarcomas	**0**	**5**	**7**	**5**	**5**	**22**	**0.00**	**15.57**	**16.44**	**11.56**	**15.85**	**14.00**	**13.93**
IXa.Rhabdomyosarcomas	0	3	4	2	2	11	0.00	9.34	9.40	4.62	6.34	7.00	7.09
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	1	1	0	1	3	0.00	3.11	2.35	0.00	3.17	1.91	2.00
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	0	0	3	2	5	0.00	0.00	0.00	6.93	6.34	3.18	2.83
IXe.Unspecified soft tissue sarcomas	0	1	2	0	0	3	0.00	3.11	4.70	0.00	0.00	1.91	2.01
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**1**	**1**	**0**	**0**	**2**	**4**	**13.15**	**3.11**	**0.00**	**0.00**	**6.34**	**2.55**	**2.80**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	0	0	0	0	1	1	0.00	0.00	0.00	0.00	3.17	0.64	0.60
Xc.Malignant gonadal germ cell tumors	1	1	0	0	1	3	13.15	3.11	0.00	0.00	3.17	1.91	2.21
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xe.Other and unspecified malignant gonadal tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XI.Other malignant epithelial neoplasms & malignant melanomas	**1**	**2**	**1**	**6**	**8**	**18**	**13.15**	**6.23**	**2.35**	**13.87**	**25.36**	**11.46**	**11.05**
XIa.Carcinoma de córtex adrenal	0	2	0	0	0	2	0.00	6.23	0.00	0.00	0.00	1.27	1.57
XIb.Thyroid carcinomas	0	0	0	0	1	1	0.00	0.00	0.00	0.00	3.17	0.64	0.60
XIc.Nasopharyngeal carcinomas	0	0	0	2	0	2	0.00	0.00	0.00	4.62	0.00	1.27	1.09
XId.Malignant melanomas	0	0	0	1	0	1	0.00	0.00	0.00	2.31	0.00	0.64	0.54
XIe.Skin carcinomas	0	0	1	2	1	4	0.00	0.00	2.35	4.62	3.17	2.55	2.30
XIf.Other and unspecified carcinomas	1	0	0	1	6	8	13.15	0.00	0.00	2.31	19.02	5.09	4.96
XII.Other and unspecified malignant neoplasms	**0**	**0**	**0**	**2**	**0**	**2**	**0.00**	**0.00**	**0.00**	**4.62**	**0.00**	**1.27**	**1.09**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIIb.Other and unspecified malignant tumors	0	0	0	2	0	2	0.00	0.00	0.00	4.62	0.00	1.27	1.09
All Neoplasms	**17**	**58**	**42**	**44**	**34**	**195**	**223.55**	**180.66**	**98.66**	**101.69**	**107.79**	**124.13**	**129.55**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

Table 14. Absolute incidence by sex and type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Campinas, 1991 to 1995*

Pediatric Tumors - Groups	Male								Female							
	Number of cases						Rates per million		Number of cases						Rates per million	
	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*
I.Leukemia	**1**	**17**	**10**	**4**	**2**	**34**	**42.69**	**46.44**	**2**	**4**	**6**	**4**	**3**	**19**	**24.53**	**25.31**
Ia.Lymphoid leukemia	1	14	6	1	1	23	28.88	32.58	1	2	3	1	2	9	11.62	12.14
Ib.Acute myeloid leukemia	0	1	1	2	0	4	5.02	4.89	1	0	3	3	1	8	10.33	9.96
Ic.Chronic myeloproliferative diseases	0	2	0	1	0	3	3.77	4.14	0	1	0	0	0	1	1.29	1.60
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	2	0	1	3	3.77	3.62	0	0	0	0	0	0	0.00	0.00
Ie.Unspecified and other specified leukemias	0	0	1	0	0	1	1.26	1.21	0	1	0	0	0	1	1.29	1.60
II.Lymphomas and reticuloendothelial neoplasms	**2**	**4**	**2**	**2**	**3**	**13**	**16.32**	**17.50**	**1**	**1**	**2**	**5**	**3**	**12**	**15.49**	**14.91**
IIa.Hodgkin lymphomas	0	2	1	2	1	6	7.53	7.62	0	0	0	1	0	1	1.29	1.11
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	2	1	1	0	2	6	7.53	8.35	1	0	0	2	3	6	7.75	7.49
IIc.Burkitt lymphoma	0	1	0	0	0	1	1.26	1.53	0	1	1	2	0	4	5.16	5.06
IId.Miscellaneous lymphoreticular neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIe.Unspecified lymphomas	0	0	0	0	0	0	0.00	0.00	0	0	1	0	0	1	1.29	1.25
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**1**	**5**	**7**	**7**	**3**	**23**	**28.88**	**28.84**	**1**	**5**	**1**	**3**	**0**	**10**	**12.91**	**14.28**
IIIa.Ependymomas and choroid plexus tumor	0	2	0	0	0	2	2.51	3.06	0	1	0	0	0	1	1.29	1.60
IIIb.Astrocytomas	1	0	2	5	3	11	13.81	12.99	0	3	1	3	0	7	9.04	9.37
IIIc.Intracranial and intraspinal embryonal tumors	0	0	1	1	0	2	2.51	2.28	0	1	0	0	0	1	1.29	1.60
IIId.Other gliomas	0	0	1	0	0	1	1.26	1.21	0	0	0	0	0	0	0.00	0.00
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	1	0	0	1	1.26	1.21	0	0	0	0	0	0	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	0	3	2	1	0	6	7.53	8.09	1	0	0	0	0	1	1.29	1.70
IV.Neuroblastoma and other peripheral nervous cell tumors	**0**	**1**	**0**	**0**	**0**	**1**	**1.26**	**1.53**	**2**	**2**	**1**	**0**	**0**	**5**	**6.46**	**7.86**
IVa.Neuroblastoma and ganglioneuroblastoma	0	1	0	0	0	1	1.26	1.53	2	2	1	0	0	5	6.46	7.86
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
V.Retinoblastoma	**1**	**2**	**1**	**0**	**0**	**4**	**5.02**	**5.88**	**1**	**3**	**0**	**0**	**0**	**4**	**5.16**	**6.51**
VI.Renal tumors	**2**	**1**	**0**	**0**	**0**	**3**	**3.77**	**4.74**	**1**	**5**	**1**	**0**	**0**	**7**	**9.04**	**10.96**
VIa.Nephroblastoma and other nonepithelial renal tumors	2	1	0	0	0	3	3.77	4.74	1	5	1	0	0	7	9.04	10.96
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIc.Unspecified malignant renal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VII.Hepatic tumors	**0**	**0**	**1**	**0**	**0**	**1**	**1.26**	**1.21**	**0**	**0**	**1**	**0**	**0**	**1**	**1.29**	**1.25**
VIIa.Hepatoblastoma	0	0	1	0	0	1	1.26	1.21	0	0	1	0	0	1	1.29	1.25
VIIb.Hepatic carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIII.Malignant bone tumors	**0**	**0**	**1**	**5**	**4**	**10**	**12.56**	**11.37**	**0**	**0**	**0**	**1**	**1**	**2**	**2.58**	**2.30**
VIIIa.Osteosarcomas	0	0	1	2	4	7	8.79	8.15	0	0	0	0	1	1	1.29	1.19
VIIIb.Chondrosarcomas	0	0	0	1	0	1	1.26	1.07	0	0	0	1	0	1	1.29	1.11
VIIIc.Ewing tumor and related sarcomas of bone	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIId.Other specified malignant bone tumors	0	0	0	1	0	1	1.26	1.07	0	0	0	0	0	0	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	0	0	1	0	1	1.26	1.07	0	0	0	0	0	0	0.00	0.00
IX.Soft tissue and other extraosseous sarcomas	**0**	**0**	**3**	**2**	**5**	**10**	**12.56**	**11.77**	**0**	**5**	**4**	**3**	**0**	**12**	**15.49**	**16.33**
IXa.Rhabdomyosarcomas	0	0	2	1	2	5	6.28	5.89	0	3	2	1	0	6	7.75	8.41
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	0	0	0	1	1	1.26	1.20	0	1	1	0	0	2	2.58	2.85
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	0	0	1	2	3	3.77	3.47	0	0	0	2	0	2	2.58	2.21
IXe.Unspecified soft tissue sarcomas	0	0	1	0	0	1	1.26	1.21	0	1	1	0	0	2	2.58	2.85
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**1**	**0**	**0**	**0**	**1**	**2**	**2.51**	**2.80**	**0**	**1**	**0**	**0**	**1**	**2**	**2.58**	**2.79**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	0	0	0.00	0.00						0	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	1	1	1.29	1.19
Xc.Malignant gonadal germ cell tumors	1	0	0	0	1	2	2.51	2.80	0	1	0	0	0	1	1.29	1.60
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xe.Other and unspecified malignant gonadal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XI.Other malignant epithelial neoplasms & malignant melanomas	**1**	**0**	**0**	**5**	**2**	**8**	**10.05**	**9.37**	**0**	**2**	**1**	**1**	**6**	**10**	**12.91**	**12.70**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0	2	0	0	0	2	2.58	3.20
XIb.Thyroid carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIc.Nasopharyngeal carcinomas	0	0	0	2	0	2	2.51	2.14	0	0	0	0	0	0	0.00	0.00
XId.Malignant melanomas	0	0	0	1	1	2	2.51	2.27	0	0	0	0	0	0	0.00	0.00
XIe.Skin carcinomas	0	0	0	2	0	2	2.51	2.14	0	0	1	0	1	2	2.58	2.44
XIf.Other and unspecified carcinomas	1	0	0	0	1	2	2.51	2.80	0	0	0	1	5	6	7.75	7.06
XII.Other and unspecified malignant neoplasms	**0**	**0**	**0**	**1**	**0**	**1**	**1.26**	**1.07**	**0**	**0**	**0**	**1**	**0**	**1**	**1.29**	**1.11**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIIb.Other and unspecified malignant tumors	0	0	0	1	0	1	1.26	1.07	0	0	0	1	0	1	1.29	1.11
All Neoplasms	**9**	**30**	**25**	**26**	**20**	**110**	**138.13**	**142.53**	**8**	**28**	**17**	**18**	**14**	**85**	**109.74**	**116.28**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

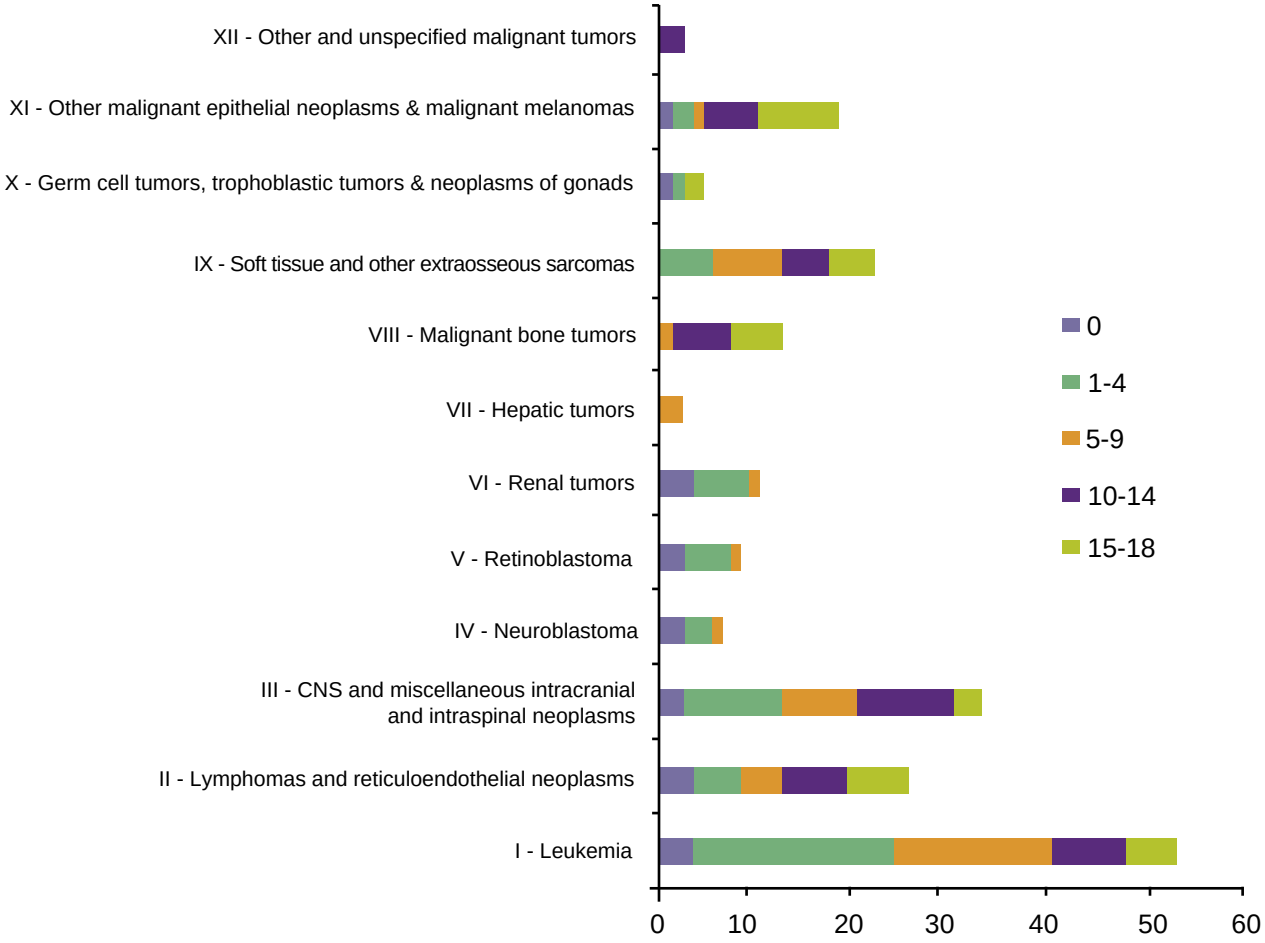

Figure 11. Number of cases by type of childhood cancer, by age group, Campinas, 1991 to 1995

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

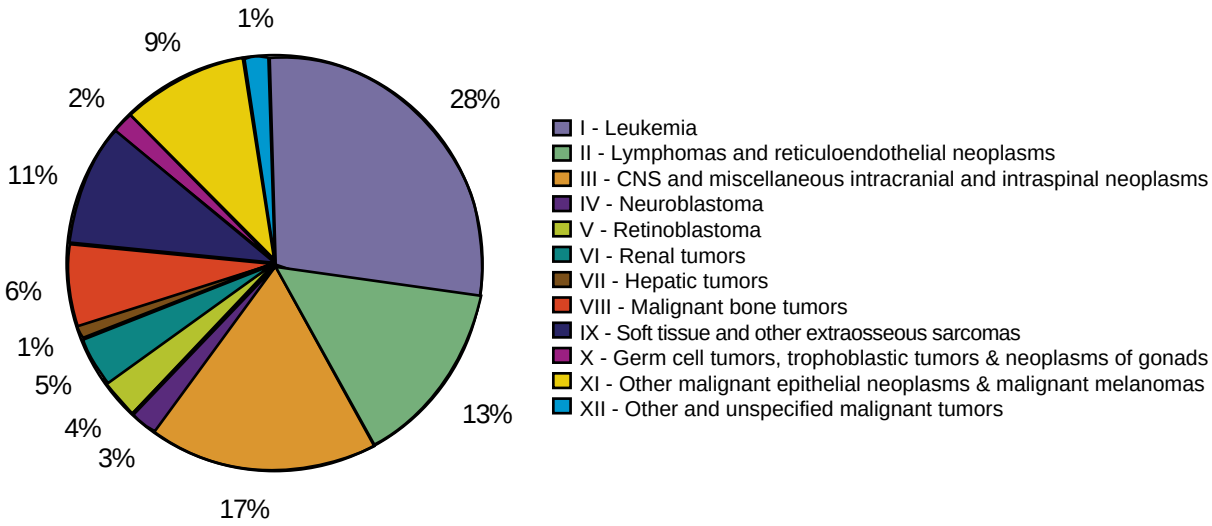

Figure 12. Percentage distribution of incidence by type of childhood cancer, Campinas, 1991 to 1995

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

PBCR of Campo Grande/MS

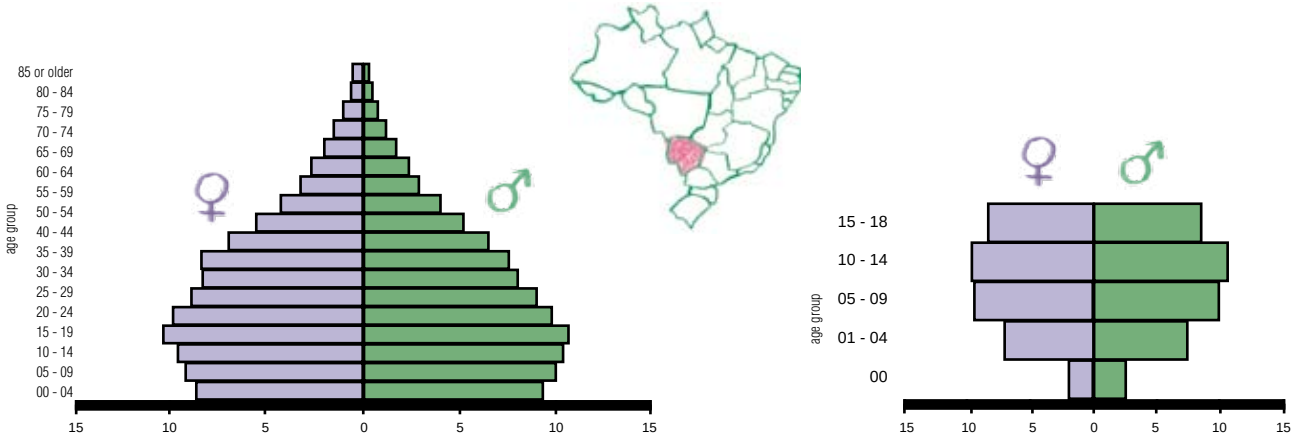

Figure 13. Population Distribution of Campo Grande

*Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Coverage area

Campo Grande's PBCR covers the municipality of Campo Grande and is located in Midwestern Brazil (Middle West region). Campo Grande lies 592m above sea level, extends 8,096 km², and 334 km² of that area is urbanized. There are approximately 724,524 inhabitants. The main professional activities involve agriculture and livestock farming. The city's climate can be described as high altitude tropical, with two clearly defined seasons: hot and humid in the summer, cold and dry in the winter. During the winter, the temperature plummets. The average annual temperature is 22.7ºC.

Health care facilities for cancer prevention and control

The programs and services are offered by 841 health units, 27 public and private hospitals with 2463 hospital beds (3.4 per 1,000 inhabitants).

Four of these hospitals are high complexity centers. There are nine higher education institutions, two of which offer medical programs.

Infrastructure and data source

The PBCR was created in 2000, although data collection started in 2002 and the first Bulletin was published in 2006 with data from the year 2000. The PBCR is located in the State Coordination of Basic Assistance, in Parque dos Poderes. It depends on permanent support due to the executive order of the Ministry of Health, n. 2607/05, supplemented by the State Health Department in 20%. The registry's staff includes a medical coordinator, a supervisor, two registrars who collect results, codification and data typing, a computer technician, and an epidemiologist. The advisory board is composed of medical doctors, coordinators, municipal and state auditors, and representatives of all institutions that provide oncological assistance throughout the state.

Data collection actively occurs in 10 notifying sources (Cancer Hospital Alfredo Abrão; University hospital Maria Aparecida Pedrossian; Regional Hospital Rosa Pedrossian; Associação Beneficente de Campo Grande – Santa Casa; Hospital São Julião; Hospital Pênfigo; UNIMED Hospital; Campo Grande Clinic; Hospital El Kadri and Municipal Health Auditing – APAC).

The death certificates are obtained from the Mortality Information System – SIM.

Use of Information

In addition to determining the incidence and geographical distribution of cancer in Campo Grande, the information has been used to supply data for epidemiological studies, administering classes and lectures, planning and supporting reports and state legislation, defining oncological assistance networks and producing bulletins.

PBCR team – Campo Grande

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Rogério Márcio Alves Souto
Jesusmar Modesto Ramos

Table 15. Population at risk by sex and age-group from 2000 to 2001

Period: 2000 - 2001	Age-group	Male	Female
	< 1	11,848	11,478
	1-4	49,278	47,537
	5-9	65,190	63,452
	10-14	67,828	65,429
	15-18	55,749	56,622
Total	0 to 18	249,893	244,518
Annual Average	0 to 18	124,947	122,259

Demographic Census of 2000 – IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Table 16. Absolute incidence by type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Campo Grande, 2000 to 2001*

Pediatric Tumors - Groups	Number of cases						Rates per million						
	0	1-4	5-9	10-14	15-18	0-18	0	1-4	5-9	10-14	15-18	Crude	Adjusted*
I.Leukemia	**1**	**6**	**9**	**4**	**6**	**26**	**42.87**	**61.97**	**69.96**	**30.02**	**53.39**	**52.59**	**53.72**
Ia.Lymphoid leukemia	1	5	9	4	3	22	42.87	51.64	69.96	30.02	26.70	44.50	46.09
Ib.Acute myeloid leukemia	0	1	0	0	3	4	0.00	10.33	0.00	0.00	26.70	8.09	7.63
Ic.Chronic myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ie.Unspecified and other specified leukemias	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
II.Lymphomas and reticuloendothelial neoplasms	**1**	**5**	**0**	**3**	**8**	**17**	**42.87**	**51.64**	**0.00**	**22.51**	**71.19**	**34.38**	**34.39**
IIa.Hodgkin lymphomas	0	1	0	1	4	6	0.00	10.33	0.00	7.50	35.60	12.14	11.07
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	2	0	2	1	5	0.00	20.66	0.00	15.01	8.90	10.11	10.40
IIc.Burkitt lymphoma	0	2	0	0	1	3	0.00	20.66	0.00	0.00	8.90	6.07	6.87
IId.Miscellaneous lymphoreticular neoplasms	1	0	0	0	0	1	42.87	0.00	0.00	0.00	0.00	2.02	2.69
IIe.Unspecified lymphomas	0	0	0	0	2	2	0.00	0.00	0.00	0.00	17.80	4.05	3.35
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**0**	**1**	**4**	**5**	**0**	**10**	**0.00**	**10.33**	**31.09**	**37.52**	**0.00**	**20.23**	**19.58**
IIIa.Ependymomas and choroid plexus tumor	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIb.Astrocytomas	0	0	1	4	0	5	0.00	0.00	7.77	30.02	0.00	10.11	9.11
IIIc.Intracranial and intraspinal embryonal tumors	0	0	1	0	0	1	0.00	0.00	7.77	0.00	0.00	2.02	2.03
IIId.Other gliomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	1	0	1	0.00	0.00	0.00	7.50	0.00	2.02	1.77
IIIf.Unspecified intracranial and intraspinal neoplasms	0	1	2	0	0	3	0.00	10.33	15.55	0.00	0.00	6.07	6.67
IV.Neuroblastoma and other peripheral nervous cell tumors	**1**	**0**	**1**	**0**	**0**	**2**	**42.87**	**0.00**	**7.77**	**0.00**	**0.00**	**4.05**	**4.73**
IVa.Neuroblastoma and ganglioneuroblastoma	1	0	1	0	0	2	42.87	0.00	7.77	0.00	0.00	4.05	4.73
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
V.Retinoblastoma	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
VI.Renal tumors	**2**	**2**	**1**	**0**	**0**	**5**	**85.74**	**20.66**	**7.77**	**0.00**	**0.00**	**10.11**	**12.61**
VIa.Nephroblastoma and other nonepithelial renal tumors	2	2	1	0	0	5	85.74	20.66	7.77	0.00	0.00	10.11	12.61
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIc.Unspecified malignant renal tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VII.Hepatic tumors	**0**	**0**	**0**	**1**	**1**	**2**	**0.00**	**0.00**	**0.00**	**7.50**	**8.90**	**4.05**	**3.45**
VIIa.Hepatoblastoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIb.Hepatic carcinomas	0	0	0	1	1	2	0.00	0.00	0.00	7.50	8.90	4.05	3.45
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIII.Malignant bone tumors	**0**	**0**	**0**	**1**	**3**	**4**	**0.00**	**0.00**	**0.00**	**7.50**	**26.70**	**8.09**	**6.80**
VIIIa.Osteosarcomas	0	0	0	1	3	4	0.00	0.00	0.00	7.50	26.70	8.09	6.80
VIIIb.Chondrosarcomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIc.Ewing tumor and related sarcomas of bone	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IX.Soft tissue and other extraosseous sarcomas	**1**	**4**	**0**	**2**	**1**	**8**	**42.87**	**41.32**	**0.00**	**15.01**	**8.90**	**16.18**	**18.29**
IXa.Rhabdomyosarcomas	0	3	0	1	0	4	0.00	30.99	0.00	7.50	0.00	8.09	9.56
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	1	0	0	0	0	1	42.87	0.00	0.00	0.00	0.00	2.02	2.69
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	1	0	1	1	3	0.00	10.33	0.00	7.50	8.90	6.07	6.04
IXe.Unspecified soft tissue sarcomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**0**	**1**	**0**	**3**	**1**	**5**	**0.00**	**10.33**	**0.00**	**22.51**	**8.90**	**10.11**	**9.58**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	1	1	0.00	0.00	0.00	0.00	8.90	2.02	1.68
Xb.Malignant extracranial and extragonadal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xc.Malignant gonadal germ cell tumors	0	1	0	1	0	2	0.00	10.33	0.00	7.50	0.00	4.05	4.36
Xd.Gonadal carcinomas	0	0	0	1	0	1	0.00	0.00	0.00	7.50	0.00	2.02	1.77
Xe.Other and unspecified malignant gonadal tumors	0	0	0	1	0	1	0.00	0.00	0.00	7.50	0.00	2.02	1.77
XI.Other malignant epithelial neoplasms & malignant melanomas	**1**	**0**	**0**	**2**	**2**	**5**	**42.87**	**0.00**	**0.00**	**15.01**	**17.80**	**10.11**	**9.58**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIb.Thyroid carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIc.Nasopharyngeal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XId.Malignant melanomas	0	0	0	0	1	1	0.00	0.00	0.00	0.00	8.90	2.02	1.68
XIe.Skin carcinomas	0	0	0	2	0	2	0.00	0.00	0.00	15.01	0.00	4.05	3.54
XIf.Other and unspecified carcinomas	1	0	0	0	1	2	42.87	0.00	0.00	0.00	8.90	4.05	4.37
XII.Other and unspecified malignant neoplasms	**0**	**0**	**0**	**1**	**1**	**2**	**0.00**	**0.00**	**0.00**	**7.50**	**8.90**	**4.05**	**3.45**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIIb.Other and unspecified malignant tumors	0	0	0	1	1	2	0.00	0.00	0.00	7.50	8.90	4.05	3.45
All Neoplasms	**7**	**19**	**15**	**22**	**23**	**86**	**300.09**	**196.25**	**116.60**	**165.09**	**204.68**	**173.94**	**176.17**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
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Table 17. Absolute incidence by sex and type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Campo Grande, 2000 to 2001*

Pediatric Tumors - Groups	Male								Female							
	Number of cases						Rates per million		Number of cases						Rates per million	
	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*
I.Leukemia	**1**	**2**	**4**	**1**	**2**	**10**	**40,02**	**41,80**	**0**	**4**	**5**	**3**	**4**	**16**	**65,43**	**65,89**
Ia.Lymphoid leukemia	1	1	4	1	1	8	32.01	33.32	0	4	5	3	2	14	57.26	59.23
Ib.Acute myeloid leukemia	0	1	0	0	1	2	8.00	8.48	0	0	0	0	2	2	8.18	6.66
Ic.Chronic myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Ie.Unspecified and other specified leukemias	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
II.Lymphomas and reticuloendothelial neoplasms	**1**	**3**	**0**	**3**	**6**	**13**	**52.02**	**51.31**	**0**	**2**	**0**	**0**	**2**	**4**	**16.36**	**17.23**
IIa.Hodgkin lymphomas	0	1	0	1	2	4	16.01	15.34	0	0	0	0	2	2	8.18	6.66
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	1	0	2	1	4	16.01	15.43	0	1	0	0	0	1	4.09	5.29
IIc.Burkitt lymphoma	0	1	0	0	1	2	8.00	8.48	0	1	0	0	0	1	4.09	5.29
IId.Miscellaneous lymphoreticular neoplasms	1	0	0	0	0	1	4.00	5.30	0	0	0	0	0	0	0.00	0.00
IIe.Unspecified lymphomas	0	0	0	0	2	2	8.00	6.76	0	0	0	0	0	0	0.00	0.00
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**0**	**0**	**3**	**2**	**0**	**5**	**20.01**	**18.99**	**0**	**1**	**1**	**3**	**0**	**5**	**20.45**	**20.21**
IIIa.Ependymomas and choroid plexus tumor	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIb.Astrocytomas	0	0	1	1	0	2	8.00	7.49	0	0	0	3	0	3	12.27	10.80
IIIc.Intracranial and intraspinal embryonal tumors	0	0	0	0	0	0	0.00	0.00	0	0	1	0	0	1	4.09	4.13
IIId.Other gliomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	1	0	1	4.00	3.47	0	0	0	0	0	0	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	0	0	2	0	0	2	8.00	8.03	0	1	0	0	0	1	4.09	5.29
IV.Neuroblastoma and other peripheral nervous cell tumors	**0**	**0**	**1**	**0**	**0**	**1**	**4.00**	**4.02**	**1**	**0**	**0**	**0**	**0**	**1**	**4.09**	**5.47**
IVa.Neuroblastoma and ganglioneuroblastoma	0	0	1	0	0	1	4.00	4.02	1	0	0	0	0	1	4.09	5.47
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
V.Retinoblastoma	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
VI.Renal tumors	**0**	**1**	**1**	**0**	**0**	**2**	**8.00**	**9.12**	**2**	**1**	**0**	**0**	**0**	**3**	**12.27**	**16.23**
VIa.Nephroblastoma and other nonepithelial renal tumors	0	1	1	0	0	2	8.00	9.12	2	1	0	0	0	3	12.27	16.23
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIc.Unspecified malignant renal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VII.Hepatic tumors	**0**	**0**	**0**	**1**	**1**	**2**	**8.00**	**6.85**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
VIIa.Hepatoblastoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIb.Hepatic carcinomas	0	0	0	1	1	2	8.00	6.85	0	0	0	0	0	0	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIII.Malignant bone tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**1**	**3**	**4**	**16.36**	**13.59**
VIIIa.Osteosarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	1	3	4	16.36	13.59
VIIIb.Chondrosarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIc.Ewing tumor and related sarcomas of bone	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IX.Soft tissue and other extraosseous sarcomas	**1**	**4**	**0**	**0**	**0**	**5**	**20.01**	**25.70**	**0**	**0**	**0**	**2**	**1**	**3**	**12.27**	**10.53**
IXa.Rhabdomyosarcomas	0	3	0	0	0	3	12.01	15.30	0	0	0	1	0	1	4.09	3.60
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	1	0	0	0	0	1	4.00	5.30	0	0	0	0	0	0	0.00	0.00
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	1	0	0	0	1	4.00	5.10	0	0	0	1	1	2	8.18	6.93
IXe.Unspecified soft tissue sarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**0**	**1**	**0**	**0**	**0**	**1**	**4.00**	**5.10**	**0**	**0**	**0**	**3**	**1**	**4**	**16.36**	**14.13**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	1	1	4.09	3.33
Xb.Malignant extracranial and extragonadal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xc.Malignant gonadal germ cell tumors	0	1	0	0	0	1	4.00	5.10	0	0	0	1	0	1	4.09	3.60
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	1	0	1	4.09	3.60
Xe.Other and unspecified malignant gonadal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	1	0	1	4.09	3.60
XI.Other malignant epithelial neoplasms & malignant melanomas	**1**	**0**	**0**	**2**	**1**	**4**	**16.01**	**15.63**	**0**	**0**	**0**	**0**	**1**	**1**	**4.09**	**3.33**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIb.Thyroid carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIc.Nasopharyngeal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XId.Malignant melanomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	1	1	4.09	3.33
XIe.Skin carcinomas	0	0	0	2	0	2	8.00	6.95	0	0	0	0	0	0	0.00	0.00
XIf.Other and unspecified carcinomas	1	0	0	0	1	2	8.00	8.68	0	0	0	0	0	0	0.00	0.00
XII.Other and unspecified malignant neoplasms	**0**	**0**	**0**	**1**	**1**	**2**	**8.00**	**6.85**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIIb.Other and unspecified malignant tumors	0	0	0	1	1	2	8.00	6.85	0	0	0	0	0	0	0.00	0.00
All Neoplasms	**4**	**11**	**9**	**10**	**11**	**45**	**180.08**	**185.38**	**3**	**8**	**6**	**12**	**12**	**41**	**167.68**	**166.62**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

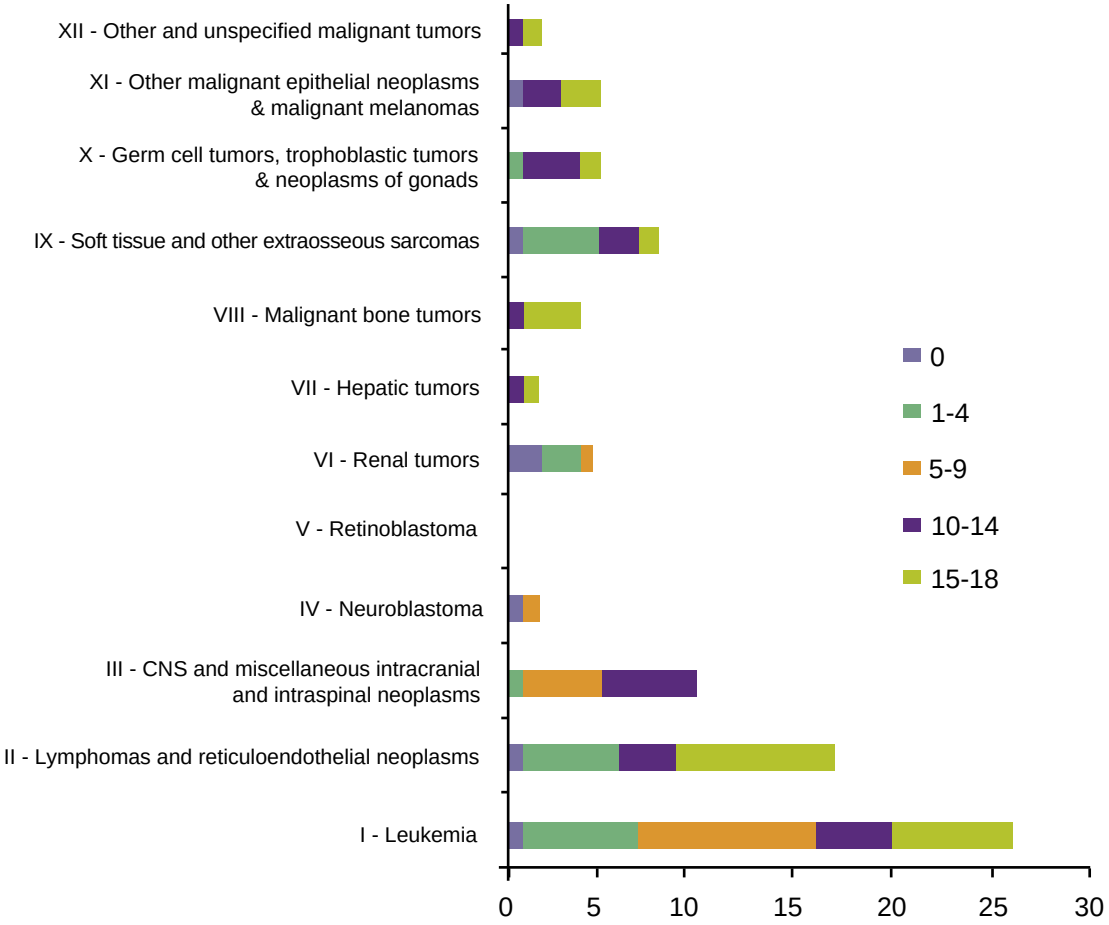

Figure 14. Number of cases by type of childhood cancer, according to age group, Campo Grande, 2000 to 2001

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

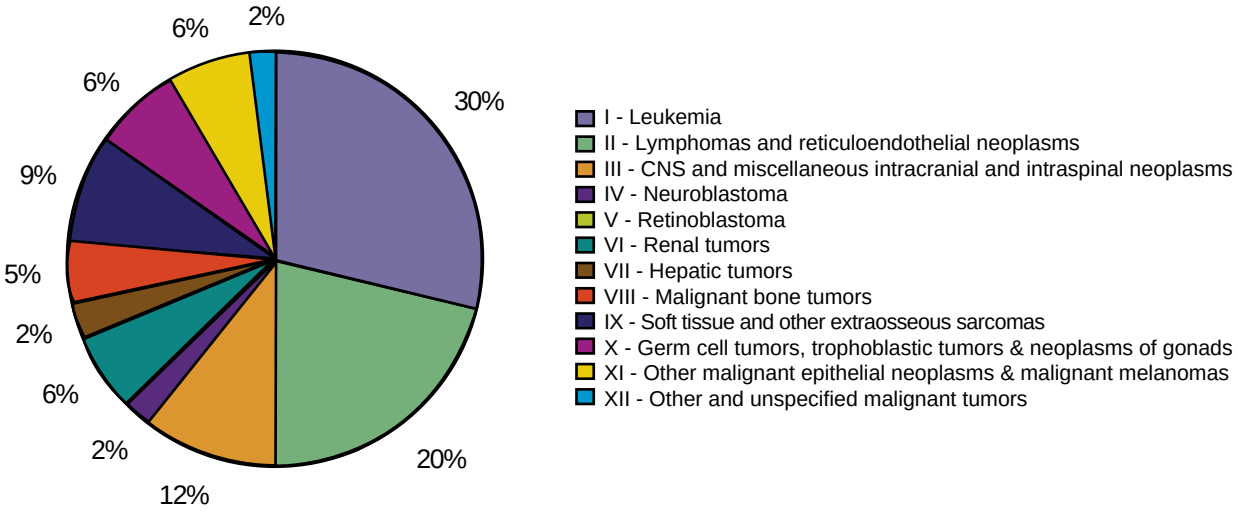

Figure 15. Percentage distribution of incidence by type of childhood cancer, Campo Grande, 2000 to 2001

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

PBCR of Cuiabá and Várzea Grande/MT

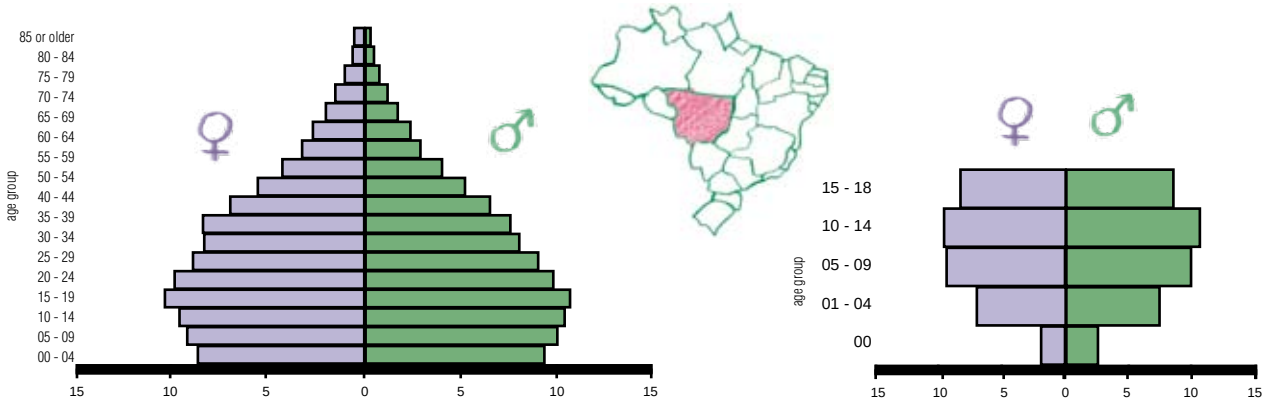

Figure 16. Population Distribution of Cuiabá and Várzea Grande

*Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Coverage area

Cuiabá's PBCR covers the municipalities of Cuiabá and Várzea Grande, located in the Middle West region of Brazil. Cuiabá and Várzea Grande extend 4,476 km^2. Approximately 98.44% of the population (about 756,831 inhabitants) reside in urban areas, with an annual growth rate of 2.72% in Cuiabá and 2.66% in Várzea Grande. The municipality of Cuiaba lies 177 m above sea level and Várzea Grande lies 191 m above sea level. The coverage area has a tropical continental climate with an average annual temperature of 33ºC.

Health care facilities for cancer prevention and control

The Superintendence of Health Vigilance, an agency of the State Department of Health of Mato Grosso is working towards attending the needs of oncology professionals and aims to subsidize the development of prevention and assistance policies, scientific research, and epidemiological studies.

Health programs and services are offered in three public hospitals and one private hospital, with 162 public hospital beds (0.23 per 100 inhabitants). There are also four health units with programs concerning cancer prevention and early detection. Other cancer diagnostic and treatment units include two radiotherapy services, six chemotherapy services, and six anatomical pathology laboratories. There are two universities offering medical degrees.

Infrastructure and data source

The PBCR was created in 1999 and data collection started in 2000. Its headquarters are in SUVISA - Superintendence of Health Vigilance of the State Department of Health of Mato Grosso, situated in the Political and Administrative Center. The PBCR depends on fixed financial support. The registry staff counts on one coordinator and five registrars/collectors. The advisory board is composed of an epidemiologist/statistician, a medical pathologist, and an oncologist.

Data collection actively occurs in 28 notifying sources: four specialized hospitals, two university hospitals, four general hospitals, six anatomical pathology laboratories, one hematology service, three oncology clinics, two radiotherapy services, and six chemotherapy services. Besides being notifying sources, the SIM and APAC also provide data complementation.

Use of Information

In addition to determining the incidence and geographical distribution of cancer in Cuiabá and Várzea Grande, the information has been used to study temporal trends; access to tracking programs; data supply of epidemiological studies; administering classes and lectures; and subsidizing actions towards prevention and oncological assistance.

PBCR team – Cuiabá and Várzea Grande

Health Surveillance Superintendent
Maria Conceição Encarnação Villa

Epidemiology and Surveillance Coordinator
Mirian Estela Souza Freire

Technical coordinator
Nurse Maria Ilma Castilho

Registrars/Collectors
Daniela Correa da Costa
Márcia Cristina Claudiano
Maria Ilma Castilho
Maria Jose L. de Oliveira Sales
Paulo Cesar Fernandes de Souza

Typists
Márcia Cristina Claudiano
Maria Ilma Castilho
Maria Jose L. de Oliveira Sales
Paulo Cesar Fernandes de Souza

Advisory board
Dr. Wilson G. Pereira – Oncologist
Nurse Marcia R. G. Pereira – Epidemiologist
Dr. Rubens Carlos de O. Junior – Cytopathologist

Table 18. Population at risk by sex and age-group from 2000 to 2003

Period: 2000 - 2003	Age-group	Male	Female
	< 1	27,207	25,260
	1-4	109,788	106,181
	5-9	143,986	139,718
	10-14	155,232	152,193
	15-18	128,526	131,845
Total	0 to 18	564,739	555,197
Annual Average	0 to 18	141,185	138,799

Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Table 19. Absolute incidence by type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Cuiabá and Várzea Grande, 2000 to 2003*

Pediatric Tumors - Groups	Number of cases						Rates per million						
	0	1-4	5-9	10-14	15-18	0-18	0	1-4	5-9	10-14	15-18	Crude	Adjusted*
I.Leukemia	**7**	**25**	**20**	**12**	**7**	**71**	**133,42**	**115,76**	**70,50**	**39,03**	**26,88**	**63,40**	**70,19**
Ia.Lymphoid leukemia	2	19	13	10	4	48	38.12	87.98	45.82	32.53	15.36	42.86	47.06
Ib.Acute myeloid leukemia	3	0	4	0	1	8	57.18	0.00	14.10	0.00	3.84	7.14	8.01
Ic.Chronic myeloproliferative diseases	0	1	0	1	0	2	0.00	4.63	0.00	3.25	0.00	1.79	1.93
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ie.Unspecified and other specified leukemias	2	5	3	1	2	13	38.12	23.15	10.57	3.25	7.68	11.61	13.20
II.Lymphomas and reticuloendothelial neoplasms	**0**	**4**	**1**	**9**	**11**	**25**	**0.00**	**18.52**	**3.52**	**29.28**	**42.25**	**22.32**	**20.44**
IIa.Hodgkin lymphomas	0	2	0	4	7	13	0.00	9.26	0.00	13.01	26.88	11.61	10.46
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	2	1	5	4	12	0.00	9.26	3.52	16.26	15.36	10.71	9.98
IIc.Burkitt lymphoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IId.Miscellaneous lymphoreticular neoplasms	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIe.Unspecified lymphomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**1**	**6**	**6**	**4**	**3**	**20**	**19.06**	**27.78**	**21.15**	**13.01**	**11.52**	**17.86**	**18.95**
IIIa.Ependymomas and choroid plexus tumor	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIb.Astrocytomas	0	2	1	2	1	6	0.00	9.26	3.52	6.51	3.84	5.36	5.51
IIIc.Intracranial and intraspinal embryonal tumors	0	2	0	2	1	5	0.00	9.26	0.00	6.51	3.84	4.46	4.58
IIId.Other gliomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	1	0	0	1	0.00	0.00	3.52	0.00	0.00	0.89	0.92
IIIf.Unspecified intracranial and intraspinal neoplasms	1	2	4	0	1	8	19.06	9.26	14.10	0.00	3.84	7.14	7.94
IV.Neuroblastoma and other peripheral nervous cell tumors	**0**	**4**	**2**	**1**	**0**	**7**	**0.00**	**18.52**	**7.05**	**3.25**	**0.00**	**6.25**	**7.27**
IVa.Neuroblastoma and ganglioneuroblastoma	0	4	2	1	0	7	0.00	18.52	7.05	3.25	0.00	6.25	7.27
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
V.Retinoblastoma	**0**	**2**	**0**	**0**	**0**	**2**	**0.00**	**9.26**	**0.00**	**0.00**	**0.00**	**1.79**	**2.33**
VI.Renal tumors	**0**	**4**	**1**	**1**	**0**	**6**	**0.00**	**18.52**	**3.52**	**3.25**	**0.00**	**5.36**	**6.34**
VIa.Nephroblastoma and other nonepithelial renal tumors	0	3	1	1	0	5	0.00	13.89	3.52	3.25	0.00	4.46	5.18
VIb.Renal carcinomas	0	1	0	0	0	1	0.00	4.63	0.00	0.00	0.00	0.89	1.16
VIc.Unspecified malignant renal tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VII.Hepatic tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
VIIa.Hepatoblastoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIb.Hepatic carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIII.Malignant bone tumors	**0**	**0**	**1**	**4**	**12**	**17**	**0.00**	**0.00**	**3.52**	**13.01**	**46.09**	**15.18**	**12.67**
VIIIa.Osteosarcomas	0	0	1	2	8	11	0.00	0.00	3.52	6.51	30.73	9.82	8.25
VIIIb.Chondrosarcomas	0	0	0	1	2	3	0.00	0.00	0.00	3.25	7.68	2.68	2.21
VIIIc.Ewing tumor and related sarcomas of bone	0	0	0	1	1	2	0.00	0.00	0.00	3.25	3.84	1.79	1.49
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	0	0	0	1	1	0.00	0.00	0.00	0.00	3.84	0.89	0.72
IX.Soft tissue and other extraosseous sarcomas	**1**	**5**	**0**	**2**	**2**	**10**	**19.06**	**23.15**	**0.00**	**6.51**	**7.68**	**8.93**	**10.00**
IXa.Rhabdomyosarcomas	0	3	0	0	1	4	0.00	13.89	0.00	0.00	3.84	3.57	4.21
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	1	0	1	0	2	0.00	4.63	0.00	3.25	0.00	1.79	1.93
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	0	0	1	1	2	0.00	0.00	0.00	3.25	3.84	1.79	1.49
IXe.Unspecified soft tissue sarcomas	1	1	0	0	0	2	19.06	4.63	0.00	0.00	0.00	1.79	2.36
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**0**	**0**	**0**	**1**	**1**	**2**	**0.00**	**0.00**	**0.00**	**3.25**	**3.84**	**1.79**	**1.49**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	0	0	0	0	1	1	0.00	0.00	0.00	0.00	3.84	0.89	0.72
Xc.Malignant gonadal germ cell tumors	0	0	0	1	0	1	0.00	0.00	0.00	3.25	0.00	0.89	0.77
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xe.Other and unspecified malignant gonadal tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XI.Other malignant epithelial neoplasms & malignant melanomas	**0**	**0**	**0**	**1**	**5**	**6**	**0.00**	**0.00**	**0.00**	**3.25**	**19.20**	**5.36**	**4.39**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIb.Thyroid carcinomas	0	0	0	0	1	1	0.00	0.00	0.00	0.00	3.84	0.89	0.72
XIc.Nasopharyngeal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XId.Malignant melanomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIe.Skin carcinomas	0	0	0	0	2	2	0.00	0.00	0.00	0.00	7.68	1.79	1.45
XIf.Other and unspecified carcinomas	0	0	0	1	2	3	0.00	0.00	0.00	3.25	7.68	2.68	2.21
XII.Other and unspecified malignant neoplasms	**1**	**2**	**2**	**7**	**7**	**19**	**19.06**	**9.26**	**7.05**	**22.77**	**26.88**	**16.97**	**15.80**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIIb.Other and unspecified malignant tumors	1	2	2	7	7	19	19.06	9.26	7.05	22.77	26.88	16.97	15.80
All Neoplasms	**10**	**52**	**33**	**42**	**48**	**185**	**190.60**	**240.78**	**116.32**	**136.62**	**184.35**	**165.19**	**169.87**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

Table 20. Absolute incidence by sex and type of cancer, crude and age-adjusted rates, per million children and adolescents, Cuiabá and Várzea Grande, 2000 to 2003*

Pediatric Tumors - Groups	Male								Female							
	Number of cases						Rates per million		Number of cases						Rates per million	
	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*
I.Leukemia	**3**	**19**	**13**	**8**	**3**	**46**	**81.45**	**90.60**	**4**	**6**	**7**	**4**	**4**	**25**	**45.03**	**49.18**
Ia.Lymphoid leukemia	0	14	7	6	1	28	49.58	55.35	2	5	6	4	3	20	36.02	38.53
Ib.Acute myeloid leukemia	1	0	4	0	0	5	8.85	9.58	2	0	0	0	1	3	5.40	6.40
Ic.Chronic myeloproliferative diseases	0	1	0	1	0	2	3.54	3.81	0	0	0	0	0	0	0.00	0.00
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Ie.Unspecified and other specified leukemias	2	4	2	1	2	11	19.48	21.86	0	1	1	0	0	2	3.60	4.24
II.Lymphomas and reticuloendothelial neoplasms	**0**	**1**	**1**	**7**	**9**	**18**	**31.87**	**27.93**	**0**	**3**	**0**	**2**	**2**	**7**	**12.61**	**13.06**
IIa.Hodgkin lymphomas	0	0	0	3	6	9	15.94	13.35	0	2	0	1	1	4	7.20	7.71
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	1	1	4	3	9	15.94	14.58	0	1	0	1	1	3	5.40	5.34
IIc.Burkitt lymphoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IId.Miscellaneous lymphoreticular neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIe.Unspecified lymphomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**1**	**3**	**2**	**0**	**2**	**8**	**14.17**	**15.75**	**0**	**3**	**4**	**4**	**1**	**12**	**21.61**	**22.22**
IIIa.Ependymomas and choroid plexus tumor	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIb.Astrocytomas	0	2	1	0	0	3	5.31	6.40	0	0	0	2	1	3	5.40	4.53
IIIc.Intracranial and intraspinal embryonal tumors	0	0	0	0	1	1	1.77	1.47	0	2	0	2	0	4	7.20	7.83
IIId.Other gliomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	1	0	0	1	1.80	1.87
IIIf.Unspecified intracranial and intraspinal neoplasms	1	1	1	0	1	4	7.08	7.88	0	1	3	0	0	4	7.20	7.99
IV.Neuroblastoma and other peripheral nervous cell tumors	**0**	**4**	**1**	**1**	**0**	**6**	**10.62**	**12.49**	**0**	**0**	**1**	**0**	**0**	**1**	**1.80**	**1.87**
IVa.Neuroblastoma and ganglioneuroblastoma	0	4	1	1	0	6	10.62	12.49	0	0	1	0	0	1	1.80	1.87
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
V.Retinoblastoma	**0**	**1**	**0**	**0**	**0**	**1**	**1.77**	**2.29**	**0**	**1**	**0**	**0**	**0**	**1**	**1.80**	**2.37**
VI.Renal tumors	**0**	**3**	**1**	**1**	**0**	**5**	**8.85**	**10.20**	**0**	**1**	**0**	**0**	**0**	**1**	**1.80**	**2.37**
VIa.Nephroblastoma and other nonepithelial renal tumors	0	3	1	1	0	5	8.85	10.20	0	0	0	0	0	0	0.00	0.00
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0	1	0	0	0	1	1.80	2.37
VIc.Unspecified malignant renal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VII.Hepatic tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
VIIa.Hepatoblastoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIb.Hepatic carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIII.Malignant bone tumors	**0**	**0**	**0**	**1**	**3**	**4**	**7.08**	**5.92**	**0**	**0**	**1**	**3**	**9**	**13**	**23.42**	**19.38**
VIIIa.Osteosarcomas	0	0	0	0	3	3	5.31	4.40	0	0	1	2	5	8	14.41	12.12
VIIIb.Chondrosarcomas	0	0	0	1	0	1	1.77	1.52	0	0	0	0	2	2	3.60	2.86
VIIIc.Ewing tumor and related sarcomas of bone	0	0	0	0	0	0	0.00	0.00	0	0	0	1	1	2	3.60	2.98
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	1	1	1.80	1.43
IX.Soft tissue and other extraosseous sarcomas	**0**	**1**	**0**	**2**	**2**	**5**	**8.85**	**8.26**	**1**	**4**	**0**	**0**	**0**	**5**	**9.01**	**11.95**
IXa.Rhabdomyosarcomas	0	1	0	0	1	2	3.54	3.76	0	2	0	0	0	2	3.60	4.73
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	0	0	1	0	1	1.77	1.52	0	1	0	0	0	1	1.80	2.37
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	0	0	1	1	2	3.54	2.98	0	0	0	0	0	0	0.00	0.00
IXe.Unspecified soft tissue sarcomas	0	0	0	0	0	0	0.00	0.00	1	1	0	0	0	2	3.60	4.85
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**0**	**0**	**0**	**0**	**1**	**1**	**1.77**	**1.47**	**0**	**0**	**0**	**1**	**0**	**1**	**1.80**	**1.55**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	0	0	0	0	1	1	1.77	1.47	0	0	0	0	0	0	0.00	0.00
Xc.Malignant gonadal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	1	0	1	1.80	1.55
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xe.Other and unspecified malignant gonadal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XI.Other malignant epithelial neoplasms & malignant melanomas	**0**	**0**	**0**	**1**	**1**	**2**	**3.54**	**2.98**	**0**	**0**	**0**	**0**	**4**	**4**	**7.20**	**5.72**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIb.Thyroid carcinomas	0	0	0	0	1	1	1.77	1.47	0	0	0	0	0	0	0.00	0.00
XIc.Nasopharyngeal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XId.Malignant melanomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIe.Skin carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	2	2	3.60	2.86
XIf.Other and unspecified carcinomas	0	0	0	1	0	1	1.77	1.52	0	0	0	0	2	2	3.60	2.86
XII.Other and unspecified malignant neoplasms	**1**	**0**	**1**	**2**	**0**	**4**	**7.08**	**7.16**	**0**	**2**	**1**	**5**	**7**	**15**	**27.02**	**24.35**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIIb.Other and unspecified malignant tumors	1	0	1	2	0	4	7.08	7.16	0	2	1	5	7	15	27.02	24.35
All Neoplasms	**5**	**32**	**19**	**23**	**21**	**100**	**177.07**	**185.04**	**5**	**20**	**14**	**19**	**27**	**85**	**153.10**	**154.01**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

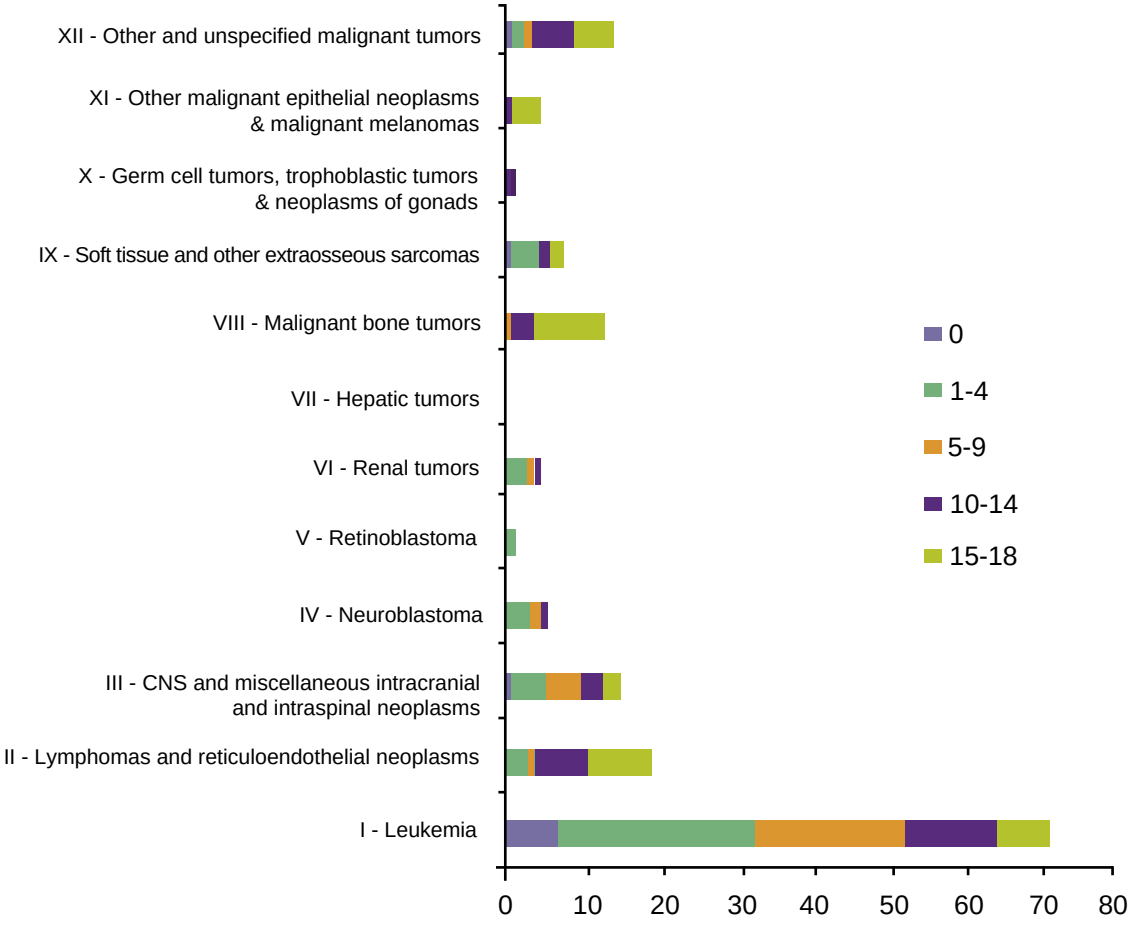

Figure 17. Number of cases by type of childhood cancer, by age group, Cuiabá and Várzea Grande, 2000 to 2003

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

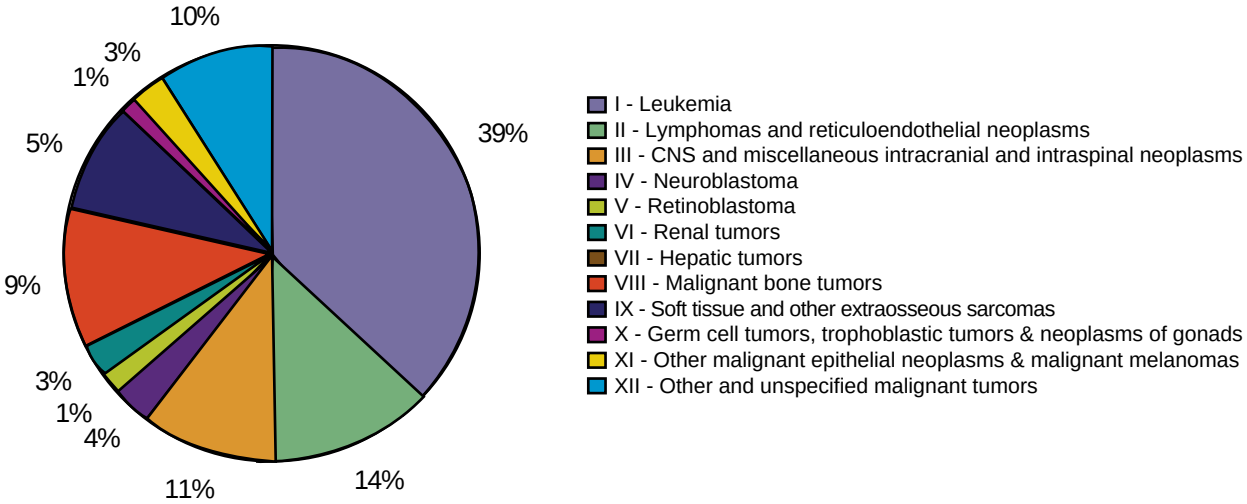

Figure 18. Percentage distribution of incidence by type of childhood cancer, Cuiabá and Várzea Grande, 2000 to 2003

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

PBCR of Curitiba/PR

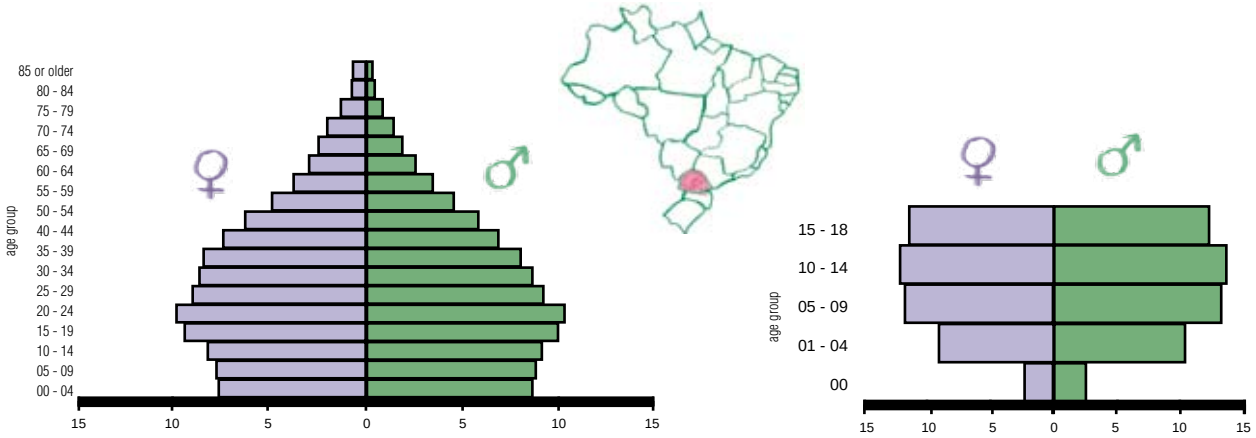

Figure 19. Population Distribution of Curitiba

*Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Coverage area

The coverage area of the PCBR is restricted to the population of Curitiba, which was 1,797,408 inhabitants in 2007, according to IBGE estimates. Curitiba occupies an area of 430.9 km² and the average altitude is 934.6 m above sea level. The climate is temperate, with an average temperature of 21º C in the summer and 13º C during the winter. The city's contained borders and population increase are causing an increase in density rate (measured by the ratio inhabitants per hectare). This rate was 14.09 in 1970 and, according to the Census 2000, the average population density is currently 36.72 inhabitants per hectare. The growth rate is decreasing each year. The fastest growth occurred between the 1970s and 80s, when the rate was 5.34% a year. The last Census considering the period 1996-2000 showed an annual growth rate of 1.82%.

Health care facilities for cancer prevention and control

Curitiba attends it population through 127 health equipments: 47 basic units, 51 Family Care (PSF) units, eight local emergency centers, eleven high complexity units, eight Psico-Social Care Centers (CAPS), one municipal hospital, and one municipal laboratory, spread across nine sanitary districts. The city counts on various private oncology centers and 23 Unified Healthcare System (SUS)-accredited hospitals, three of which are public and the rest of which are private and philanthropic. Four of these are Oncology Units (CACON) and seven are educational institutions. Four universities offer medical degrees.

Infrastructure and data source

The Population-Based Cancer Registry of Curitiba is inserted in the Epidemiology Center of the City Department of Health and started its activities in 1997. It currently counts on the following staff: one dentist, Collective Health specialist and coordinator; a nurse, a nursing assistant and a dental technician as registrars; one typist and one medical pathologist. The whole PBCR staff is composed of tenured municipal public servants .

Data collection is mostly active but also passive. The information is collected in all public and private hospitals; centers for diagnosis and treatment of cancer patients; pathology labs; radiotherapy and/or chemotherapy clinics; SISCAN (cancer information system used for early detection of uterine cancer) and SIM (Mortality Information System).

Curitiba currently possesses 40 active notifying sources and has published data concerning the period from 1998 to 2002.

PBCR team – Curitiba

Coordinator

Cyntia Asturian Laporte

Registrars/Codifiers

Maria Rita Ostrowski Martins

Cíntia da Costa Marques

Vivian de Fátima Blanchet

Typist

Edir Walewski

Advisory board

Fábio Tironi

Table 21. Population at risk by sex and age-group from 1998 to 2002

Period: 1998 - 2002	Age-group	Male	Female
	< 1	66,821	64,106
	1-4	270,128	257,970
	5-9	343,995	331,343
	10-14	359,209	353,288
	15-18	308,870	315,731
Total	0 to 18	1,349,023	1,322,438
Annual Average	0 to 18	269,805	264,488

Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Table 22. Absolute incidence by type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Curitiba, 1998 to 2002*

Pediatric Tumors - Groups	Number of cases						Rates per million						
	0	1-4	5-9	10-14	15-18	0-18	0	1-4	5-9	10-14	15-18	Crude	Adjusted*
I.Leukemia	**4**	**58**	**48**	**27**	**26**	**163**	**30.55**	**109.83**	**71.08**	**37.89**	**41.63**	**61.02**	**64.90**
Ia.Lymphoid leukemia	2	45	39	19	15	120	15.28	85.21	57.75	26.67	24.02	44.92	48.30
Ib.Acute myeloid leukemia	1	10	5	5	10	31	7.64	18.94	7.40	7.02	16.01	11.60	11.85
Ic.Chronic myeloproliferative diseases	0	2	2	2	1	7	0.00	3.79	2.96	2.81	1.60	2.62	2.69
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	1	1	0	0	2	0.00	1.89	1.48	0.00	0.00	0.75	0.86
Ie.Unspecified and other specified leukemias	1	0	1	1	0	3	7.64	0.00	1.48	1.40	0.00	1.12	1.20
II.Lymphomas and reticuloendothelial neoplasms	**0**	**11**	**17**	**14**	**29**	**71**	**0.00**	**20.83**	**25.17**	**19.65**	**46.43**	**26.58**	**25.20**
IIa.Hodgkin lymphomas	0	2	6	7	23	38	0.00	3.79	8.88	9.82	36.82	14.22	12.53
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	2	4	4	5	15	0.00	3.79	5.92	5.61	8.01	5.61	5.33
IIc.Burkitt lymphoma	0	4	6	2	0	12	0.00	7.57	8.88	2.81	0.00	4.49	4.89
IId.Miscellaneous lymphoreticular neoplasms	0	2	0	1	0	3	0.00	3.79	0.00	1.40	0.00	1.12	1.28
IIe.Unspecified lymphomas	0	1	1	0	1	3	0.00	1.89	1.48	0.00	1.60	1.12	1.17
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**2**	**15**	**29**	**12**	**10**	**68**	**15.28**	**28.40**	**42.94**	**16.84**	**16.01**	**25.45**	**26.32**
IIIa.Ependymomas and choroid plexus tumor	0	3	0	1	1	5	0.00	5.68	0.00	1.40	1.60	1.87	2.06
IIIb.Astrocytomas	1	2	6	4	7	20	7.64	3.79	8.88	5.61	11.21	7.49	7.19
IIIc.Intracranial and intraspinal embryonal tumors	0	5	16	4	0	25	0.00	9.47	23.69	5.61	0.00	9.36	9.90
IIId.Other gliomas	0	3	2	2	0	7	0.00	5.68	2.96	2.81	0.00	2.62	2.86
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	1	2	5	1	2	11	7.64	3.79	7.40	1.40	3.20	4.12	4.30
IV.Neuroblastoma and other peripheral nervous cell tumors	**2**	**19**	**3**	**1**	**0**	**25**	**15.28**	**35.98**	**4.44**	**1.40**	**0.00**	**9.36**	**11.49**
IVa.Neuroblastoma and ganglioneuroblastoma	2	19	3	1	0	25	15.28	35.98	4.44	1.40	0.00	9.36	11.49
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
V.Retinoblastoma	**1**	**5**	**0**	**0**	**0**	**6**	**7.64**	**9.47**	**0.00**	**0.00**	**0.00**	**2.25**	**2.86**
VI.Renal tumors	**2**	**8**	**1**	**0**	**0**	**11**	**15.28**	**15.15**	**1.48**	**0.00**	**0.00**	**4.12**	**5.15**
VIa.Nephroblastoma and other nonepithelial renal tumors	1	8	1	0	0	10	7.64	15.15	1.48	0.00	0.00	3.74	4.67
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIc.Unspecified malignant renal tumors	1	0	0	0	0	1	7.64	0.00	0.00	0.00	0.00	0.37	0.48
VII.Hepatic tumors	**0**	**0**	**0**	**0**	**2**	**2**	**0.00**	**0.00**	**0.00**	**0.00**	**3.20**	**0.75**	**0.60**
VIIa.Hepatoblastoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIb.Hepatic carcinomas	0	0	0	0	2	2	0.00	0.00	0.00	0.00	3.20	0.75	0.60
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIII.Malignant bone tumors	**1**	**1**	**7**	**7**	**12**	**28**	**7.64**	**1.89**	**10.37**	**9.82**	**19.21**	**10.48**	**9.60**
VIIIa.Osteosarcomas	1	0	5	2	6	14	7.64	0.00	7.40	2.81	9.61	5.24	4.89
VIIIb.Chondrosarcomas	0	0	0	0	1	1	0.00	0.00	0.00	0.00	1.60	0.37	0.30
VIIIc.Ewing tumor and related sarcomas of bone	0	0	2	5	4	11	0.00	0.00	2.96	7.02	6.40	4.12	3.64
VIIId.Other specified malignant bone tumors	0	1	0	0	0	1	0.00	1.89	0.00	0.00	0.00	0.37	0.48
VIIIe.Unspecified malignant bone tumors	0	0	0	0	1	1	0.00	0.00	0.00	0.00	1.60	0.37	0.30
IX.Soft tissue and other extraosseous sarcomas	**0**	**5**	**8**	**9**	**11**	**33**	**0.00**	**9.47**	**11.85**	**12.63**	**17.61**	**12.35**	**11.78**
IXa.Rhabdomyosarcomas	0	4	5	4	5	18	0.00	7.57	7.40	5.61	8.01	6.74	6.67
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	1	0	2	3	6	0.00	1.89	0.00	2.81	4.80	2.25	2.04
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	0	2	3	1	6	0.00	0.00	2.96	4.21	1.60	2.25	2.07
IXe.Unspecified soft tissue sarcomas	0	0	1	0	2	3	0.00	0.00	1.48	0.00	3.20	1.12	0.99
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**3**	**15**	**7**	**4**	**8**	**37**	**22.91**	**28.40**	**10.37**	**5.61**	**12.81**	**13.85**	**15.03**
Xa.Intracranial and intraspinal germ cell tumors	0	1	0	1	1	3	0.00	1.89	0.00	1.40	1.60	1.12	1.11
Xb.Malignant extracranial and extragonadal germ cell tumors	2	1	0	0	0	3	15.28	1.89	0.00	0.00	0.00	1.12	1.44
Xc.Malignant gonadal germ cell tumors	0	1	2	0	5	8	0.00	1.89	2.96	0.00	8.01	2.99	2.76
Xd.Gonadal carcinomas	1	8	4	2	2	17	7.64	15.15	5.92	2.81	3.20	6.36	7.10
Xe.Other and unspecified malignant gonadal tumors	0	4	1	1	0	6	0.00	7.57	1.48	1.40	0.00	2.25	2.62
XI.Other malignant epithelial neoplasms & malignant melanomas	**2**	**3**	**5**	**6**	**23**	**39**	**15.28**	**5.68**	**7.40**	**8.42**	**36.82**	**14.60**	**13.25**
XIa.Adrenocortical carcinomas	0	2	0	1	0	3	0.00	3.79	0.00	1.40	0.00	1.12	1.28
XIb.Thyroid carcinomas	0	0	0	0	8	8	0.00	0.00	0.00	0.00	12.81	2.99	2.41
XIc.Nasopharyngeal carcinomas	0	0	0	0	3	3	0.00	0.00	0.00	0.00	4.80	1.12	0.91
XId.Malignant melanomas	1	0	2	2	4	9	7.64	0.00	2.96	2.81	6.40	3.37	3.12
XIe.Skin carcinomas	0	0	1	1	2	4	0.00	0.00	1.48	1.40	3.20	1.50	1.32
XIf.Other and unspecified carcinomas	1	1	2	2	6	12	7.64	1.89	2.96	2.81	9.61	4.49	4.20
XII.Other and unspecified malignant neoplasms	**2**	**2**	**1**	**1**	**2**	**8**	**15.28**	**3.79**	**1.48**	**1.40**	**3.20**	**2.99**	**3.23**
XIIa.Other specified malignant tumors	0	0	0	0	2	2	0.00	0.00	0.00	0.00	3.20	0.75	0.60
XIIb.Other and unspecified malignant tumors	2	2	1	1	0	6	15.28	3.79	1.48	1.40	0.00	2.25	2.63
All Neoplasms	**19**	**142**	**126**	**81**	**123**	**491**	**145.12**	**268.89**	**186.57**	**113.68**	**196.93**	**183.79**	**189.43**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

Table 23. Absolute incidence by sex and type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Curitiba, 1998 to 2002*

Pediatric Tumors - Groups	Male								Female							
	Number of cases						Rates per million		Number of cases						Rates per million	
	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*
I.Leukemia	**2**	**21**	**26**	**10**	**19**	**78**	**57.82**	**59.36**	**2**	**36**	**22**	**17**	**7**	**84**	**63.52**	**69.93**
Ia.Lymphoid leukemia	0	15	18	9	12	54	40.03	40.88	2	29	21	10	3	65	49.15	55.26
Ib.Acute myeloid leukemia	1	6	4	1	7	19	14.08	14.49	0	4	1	4	3	12	9.07	9.15
Ic.Chronic myeloproliferative diseases	0	0	2	0	0	2	1.48	1.52	0	2	0	2	1	5	3.78	3.88
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	1	0	0	1	0.74	0.76	0	1	0	0	0	1	0.76	0.97
Ie.Unspecified and other specified leukemias	1	0	1	0	0	2	1.48	1.70	0	0	0	1	0	1	0.76	0.67
II.Lymphomas and reticuloendothelial neoplasms	**0**	**8**	**10**	**8**	**18**	**44**	**32.62**	**31.28**	**0**	**3**	**7**	**6**	**11**	**27**	**20.42**	**19.02**
IIa.Hodgkin lymphomas	0	2	4	4	13	23	17.05	15.46	0	0	2	3	10	15	11.34	9.55
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	1	1	2	4	8	5.93	5.44	0	1	3	2	1	7	5.29	5.28
IIc.Burkitt lymphoma	0	3	4	2	0	9	6.67	7.15	0	1	2	0	0	3	2.27	2.55
IId.Miscellaneous lymphoreticular neoplasms	0	1	0	0	0	1	0.74	0.93	0	1	0	1	0	2	1.51	1.64
IIe.Unspecified lymphomas	0	1	1	0	1	3	2.22	2.30	0	0	0	0	0	0	0.00	0.00
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**0**	**10**	**23**	**6**	**3**	**42**	**31.13**	**32.57**	**2**	**5**	**6**	**6**	**7**	**26**	**19.66**	**19.75**
IIIa.Ependymomas and choroid plexus tumor	0	3	0	1	0	4	2.97	3.45	0	0	0	0	1	1	0.76	0.60
IIIb.Astrocytomas	0	2	4	3	3	12	8.90	8.70	1	0	2	1	4	8	6.05	5.61
IIIc.Intracranial and intraspinal embryonal tumors	0	2	13	1	0	16	11.86	12.41	0	3	3	3	0	9	6.81	7.29
IIId.Other gliomas	0	2	1	0	0	3	2.22	2.62	0	1	1	2	0	4	3.02	3.10
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	0	1	5	1	0	7	5.19	5.39	1	1	0	0	2	4	3.02	3.15
IV.Neuroblastoma and other peripheral nervous cell tumors	**1**	**8**	**1**	**0**	**0**	**10**	**7.41**	**9.14**	**1**	**11**	**2**	**1**	**0**	**15**	**11.34**	**13.94**
IVa.Neuroblastoma and ganglioneuroblastoma	1	8	1	0	0	10	7.41	9.14	1	11	2	1	0	15	11.34	13.94
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
V.Retinoblastoma	**1**	**2**	**0**	**0**	**0**	**3**	**2.22**	**2.80**	**0**	**3**	**0**	**0**	**0**	**3**	**2.27**	**2.92**
VI.Renal tumors	**0**	**5**	**0**	**0**	**0**	**5**	**3.71**	**4.65**	**2**	**3**	**1**	**0**	**0**	**6**	**4.54**	**5.67**
VIa.Nephroblastoma and other nonepithelial renal tumors	0	5	0	0	0	5	3.71	4.65	1	3	1	0	0	5	3.78	4.69
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIc.Unspecified malignant renal tumors	0	0	0	0	0	0	0.00	0.00	1	0	0	0	0	1	0.76	0.98
VII.Hepatic tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**0**	**2**	**2**	**1.51**	**1.19**
VIIa.Hepatoblastoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIb.Hepatic carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	2	2	1.51	1.19
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIII.Malignant bone tumors	**1**	**1**	**4**	**4**	**7**	**17**	**12.60**	**11.81**	**0**	**0**	**3**	**3**	**5**	**11**	**8.32**	**7.36**
VIIIa.Osteosarcomas	1	0	3	2	5	11	8.15	7.59	0	0	2	0	1	3	2.27	2.18
VIIIb.Chondrosarcomas	0	0	0	0	1	1	0.74	0.61	0	0	0	0	0	0	0.00	0.00
VIIIc.Ewing tumor and related sarcomas of bone	0	0	1	2	0	3	2.22	2.07	0	0	1	3	4	8	6.05	5.18
VIIId.Other specified malignant bone tumors	0	1	0	0	0	1	0.74	0.93	0	0	0	0	0	0	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	0	0	0	1	1	0.74	0.61	0	0	0	0	0	0	0.00	0.00
IX.Soft tissue and other extraosseous sarcomas	**0**	**3**	**5**	**2**	**8**	**18**	**13.34**	**12.79**	**0**	**2**	**3**	**7**	**3**	**15**	**11.34**	**10.78**
IXa.Rhabdomyosarcomas	0	2	2	1	5	10	7.41	7.09	0	2	3	3	0	8	6.05	6.32
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	1	0	1	1	3	2.22	2.20	0	0	0	1	2	3	2.27	1.86
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	0	2	0	1	3	2.22	2.13	0	0	0	3	0	3	2.27	2.00
IXe.Unspecified soft tissue sarcomas	0	0	1	0	1	2	1.48	1.37	0	0	0	0	1	1	0.76	0.60
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**2**	**14**	**5**	**4**	**6**	**31**	**22.98**	**25.00**	**1**	**1**	**2**	**0**	**2**	**6**	**4.54**	**4.73**
Xa.Intracranial and intraspinal germ cell tumors	0	1	0	1	1	3	2.22	2.20	0	0	0	0	0	0	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	1	0	0	0	0	1	0.74	0.94	1	1	0	0	0	2	1.51	1.95
Xc.Malignant gonadal germ cell tumors	0	1	0	0	5	6	4.45	3.98	0	0	2	0	0	2	1.51	1.58
Xd.Gonadal carcinomas	1	8	4	2	0	15	11.12	12.74	0	0	0	0	2	2	1.51	1.19
Xe.Other and unspecified malignant gonadal tumors	0	4	1	1	0	6	4.45	5.14	0	0	0	0	0	0	0.00	0.00
XI.Other malignant epithelial neoplasms & malignant melanomas	**2**	**2**	**4**	**2**	**6**	**16**	**11.86**	**11.76**	**0**	**1**	**1**	**4**	**17**	**23**	**17.39**	**14.58**
XIa.Adrenocortical carcinomas	0	1	0	0	0	1	0.74	0.93	0	1	0	1	0	2	1.51	1.64
XIb.Thyroid carcinomas	0	0	0	0	1	1	0.74	0.61	0	0	0	0	7	7	5.29	4.18
XIc.Nasopharyngeal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	3	3	2.27	1.79
XId.Malignant melanomas	1	0	1	1	3	6	4.45	4.19	0	0	1	1	1	3	2.27	2.05
XIe.Skin carcinomas	0	0	1	0	0	1	0.74	0.76	0	0	0	1	2	3	2.27	1.86
XIf.Other and unspecified carcinomas	1	1	2	1	2	7	5.19	5.27	0	0	0	1	4	5	3.78	3.05
XII.Other and unspecified malignant neoplasms	**0**	**1**	**1**	**0**	**0**	**2**	**1.48**	**1.69**	**2**	**1**	**0**	**1**	**2**	**6**	**4.54**	**4.80**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	2	2	1.51	1.19
XIIb.Other and unspecified malignant tumors	0	1	1	0	0	2	1.48	1.69	2	1	0	1	0	4	3.02	3.60
All Neoplasms	**9**	**75**	**79**	**36**	**67**	**266**	**197.18**	**202.85**	**10**	**66**	**47**	**45**	**56**	**224**	**169.38**	**174.67**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
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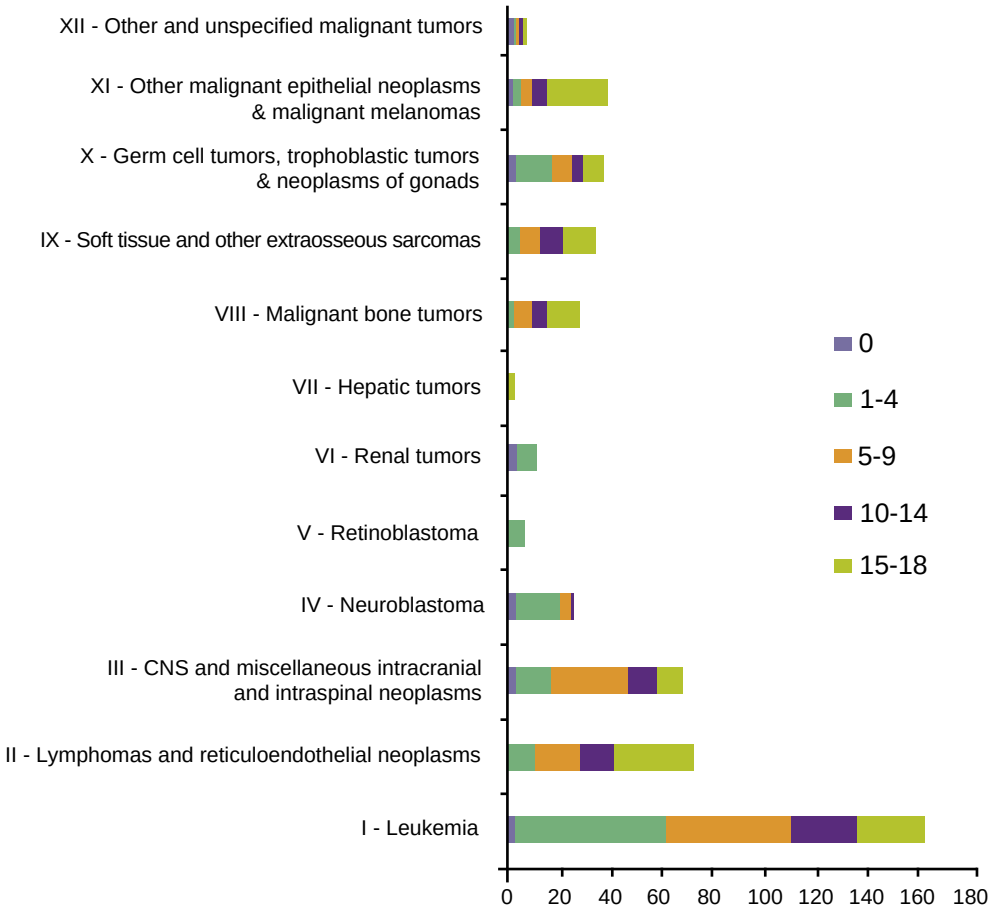

Figure 20. Number of cases by type of childhood cancer, by age group, Curitiba, 1998 to 2002

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

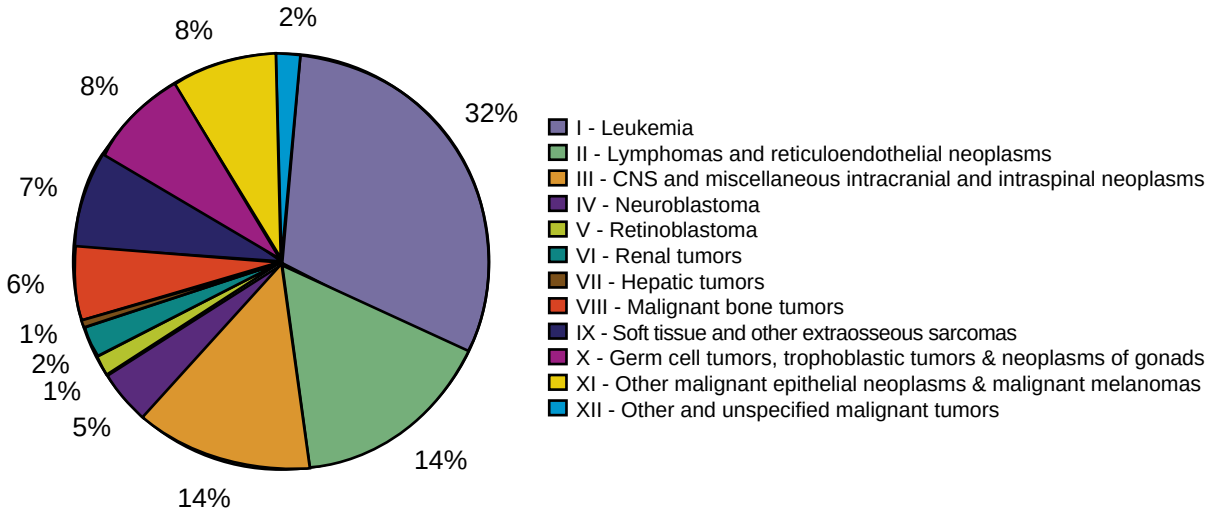

Figure 21. Percentage distribution of incidence by type of childhood cancer, Curitiba, 1998 to 2002

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

PBCR of Distrito Federal

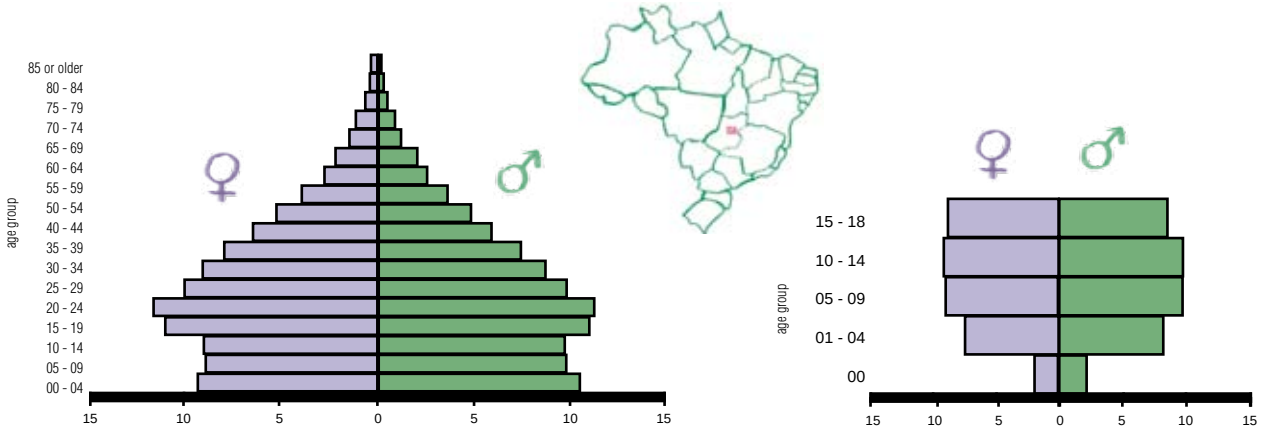

Figure 22. Population Distribution of Distrito Federal

*Demographic Census of 2000 - IBGE
Sources: MP/ Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Coverage area

The PBCR of Distrito Federal covers the Distrito Federal, located in Midwestern Brazil. Distrito Federal extends an area of about 5,801.937 km² and a population of approximately 2,483,505 inhabitants. Distrito Federal is 1,100m above sea level, with an average annual temperature of 20.5°C.

Background

Between 1999 and 2001, in view of the elevated incidence and mortality rates from malignant neoplasms, the Ministry of Health, by means of the National Cancer Institute (INCA), established a partnership with State Departments of Health aiming to implement surveillance and evaluation programs against cancer and its risk factors – PAV. At the time, financial resources were allocated for operating this infrastructure. The PBCR of Distrito Federal receives financial support from the Ministry of Health and aims to strengthen the quality and quantity of local information.

The Ministry's decree Portaria n. 2,607, 12/28/05 instituted financial incentives to afford the actitivities developed by the Population-Based Cancer Registry (PBCR). The information obtained from the PBCR helps determine the need for publicizing campaigns for early detection and prevention of cancer and helps the assessment of new diagnostic techniques and epidemiological research. The Health Department of Distrito Federal is responsible for developing policies towards cancer prevention and control within Distrito Federal. One of its functions is the state coordination of cancer surveillance. These actions employ the methodology defined by the National Cancer Institute, which renders federal units responsible for the regional management of databases by means of computerized information systems. Thus, the Health Department of Distrito Federal is responsible for the Population-Based Cancer Registry in Distrito Federal - SISPASEPOP, the women's cancer system - SISCAM/ SISMAMA, and hospital cancer registry systems – SISRHC. These systems cross with other health information systems such as SIM, SIA and SIH. They generate information, which is periodically sent to the Ministry of Health, according to the norms established by the Department of Health of Distrito Federal and the Ministry of Health.

PBCR team – Distrito Federal

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Ana Lúcia Ávila
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Table 24. Population at risk by sex and age-group from 1999 to 2002

Period: 1999 - 2002	Age-group	Male	Female
	< 1	104,587	101,400
	1-4	406,125	392,863
	5-9	486,238	478,022
	10-14	499,788	502,640
	15-18	433,588	476,510
Total	0 a 18	1,930,326	1,951,435
Annual Average	0 a 18	482,582	487,859

Demographic Census of 2000 - IBGE
Sources: MP/ Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Table 25. Absolute incidence by type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Distrito Federal, 1999 to 2002*

Pediatric Tumors - Groups	Number of cases						Rates per million						
	0	1-4	5-9	10-14	15-18	0-18	0	1-4	5-9	10-14	15-18	Crude	Adjusted*
I.Leukemia	**2**	**36**	**36**	**23**	**11**	**108**	**9.71**	**45.06**	**37.33**	**22.94**	**12.09**	**27.82**	**29.39**
Ia.Lymphoid leukemia	1	30	24	17	4	76	4.85	37.55	24.89	16.96	4.40	19.58	21.08
Ib.Acute myeloid leukemia	1	5	6	3	3	18	4.85	6.26	6.22	2.99	3.30	4.64	4.83
Ic.Chronic myeloproliferative diseases	0	0	1	1	2	4	0.00	0.00	1.04	1.00	2.20	1.03	0.92
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	1	2	0	2	5	0.00	1.25	2.07	0.00	2.20	1.29	1.27
Ie.Unspecified and other specified leukemias	0	0	3	2	0	5	0.00	0.00	3.11	2.00	0.00	1.29	1.28
II.Lymphomas and reticuloendothelial neoplasms	**0**	**16**	**29**	**20**	**23**	**88**	**0.00**	**20.03**	**30.07**	**19.95**	**25.27**	**22.67**	**22.37**
IIa.Hodgkin lymphomas	0	2	12	7	7	28	0.00	2.50	12.44	6.98	7.69	7.21	6.98
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	10	12	11	14	47	0.00	12.52	12.44	10.97	15.38	12.11	11.89
IIc.Burkitt lymphoma	0	3	3	2	1	9	0.00	3.75	3.11	2.00	1.10	2.32	2.44
IId.Miscellaneous lymphoreticular neoplasms	0	1	1	0	0	2	0.00	1.25	1.04	0.00	0.00	0.52	0.59
IIe.Unspecified lymphomas	0	0	1	0	1	2	0.00	0.00	1.04	0.00	1.10	0.52	0.48
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**2**	**19**	**28**	**26**	**18**	**93**	**9.71**	**23.78**	**29.04**	**25.94**	**19.78**	**23.96**	**24.03**
IIIa.Ependymomas and choroid plexus tumor	0	2	0	0	0	2	0.00	2.50	0.00	0.00	0.00	0.52	0.63
IIIb.Astrocytomas	1	6	13	13	4	37	4.85	7.51	13.48	12.97	4.40	9.53	9.61
IIIc.Intracranial and intraspinal embryonal tumors	0	3	4	4	1	12	0.00	3.75	4.15	3.99	1.10	3.09	3.18
IIId.Other gliomas	0	1	1	2	1	5	0.00	1.25	1.04	2.00	1.10	1.29	1.26
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	1	7	10	7	12	37	4.85	8.76	10.37	6.98	13.19	9.53	9.35
IV.Neuroblastoma and other peripheral nervous cell tumors	**1**	**8**	**6**	**1**	**1**	**17**	**4.85**	**10.01**	**6.22**	**1.00**	**1.10**	**4.38**	**4.89**
IVa.Neuroblastoma and ganglioneuroblastoma	1	8	6	1	1	17	4.85	10.01	6.22	1.00	1.10	4.38	4.89
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
V.Retinoblastoma	**0**	**8**	**0**	**0**	**0**	**8**	**0.00**	**10.01**	**0.00**	**0.00**	**0.00**	**2.06**	**2.52**
VI.Renal tumors	**1**	**22**	**5**	**2**	**0**	**30**	**4.85**	**27.53**	**5.19**	**2.00**	**0.00**	**7.73**	**9.05**
VIa.Nephroblastoma and other nonepithelial renal tumors	1	16	4	2	0	23	4.85	20.03	4.15	2.00	0.00	5.93	6.89
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIc.Unspecified malignant renal tumors	0	6	1	0	0	7	0.00	7.51	1.04	0.00	0.00	1.80	2.16
VII.Hepatic tumors	**1**	**1**	**0**	**0**	**0**	**2**	**4.85**	**1.25**	**0.00**	**0.00**	**0.00**	**0.52**	**0.62**
VIIa.Hepatoblastoma	0	1	0	0	0	1	0.00	1.25	0.00	0.00	0.00	0.26	0.31
VIIb.Hepatic carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	1	0	0	0	0	1	4.85	0.00	0.00	0.00	0.00	0.26	0.31
VIII.Malignant bone tumors	**1**	**5**	**5**	**16**	**13**	**40**	**4.85**	**6.26**	**5.19**	**15.96**	**14.28**	**10.30**	**9.69**
VIIIa.Osteosarcomas	0	0	1	4	3	8	0.00	0.00	1.04	3.99	3.30	2.06	1.83
VIIIb.Chondrosarcomas	0	0	0	1	3	4	0.00	0.00	0.00	1.00	3.30	1.03	0.86
VIIIc.Ewing tumor and related sarcomas of bone	0	0	0	4	1	5	0.00	0.00	0.00	3.99	1.10	1.29	1.15
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIe.Unspecified malignant bone tumors	1	5	4	7	6	23	4.85	6.26	4.15	6.98	6.59	5.93	5.85
IX.Soft tissue and other extraosseous sarcomas	**1**	**6**	**7**	**6**	**3**	**23**	**4.85**	**7.51**	**7.26**	**5.99**	**3.30**	**5.93**	**6.12**
IXa.Rhabdomyosarcomas	0	4	5	3	1	13	0.00	5.01	5.19	2.99	1.10	3.35	3.53
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	1	0	1	3	1	6	4.85	0.00	1.04	2.99	1.10	1.55	1.49
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	1	1	0	0	2	0.00	1.25	1.04	0.00	0.00	0.52	0.59
IXe.Unspecified soft tissue sarcomas	0	1	0	0	1	2	0.00	1.25	0.00	0.00	1.10	0.52	0.52
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**0**	**2**	**5**	**7**	**13**	**27**	**0.00**	**2.50**	**5.19**	**6.98**	**14.28**	**6.96**	**6.32**
Xa.Intracranial and intraspinal germ cell tumors	0	0	2	0	0	2	0.00	0.00	2.07	0.00	0.00	0.52	0.54
Xb.Malignant extracranial and extragonadal germ cell tumors	0	1	0	0	5	6	0.00	1.25	0.00	0.00	5.49	1.55	1.35
Xc.Malignant gonadal germ cell tumors	0	0	2	2	4	8	0.00	0.00	2.07	2.00	4.40	2.06	1.84
Xd.Gonadal carcinomas	0	0	0	0	1	1	0.00	0.00	0.00	0.00	1.10	0.26	0.21
Xe.Other and unspecified malignant gonadal tumors	0	1	1	5	3	10	0.00	1.25	1.04	4.99	3.30	2.58	2.38
XI.Other malignant epithelial neoplasms & malignant melanomas	**4**	**4**	**6**	**23**	**21**	**58**	**19.42**	**5.01**	**6.22**	**22.94**	**23.07**	**14.94**	**13.86**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIb.Thyroid carcinomas	0	0	1	4	8	13	0.00	0.00	1.04	3.99	8.79	3.35	2.87
XIc.Nasopharyngeal carcinomas	0	0	0	4	3	7	0.00	0.00	0.00	3.99	3.30	1.80	1.56
XId.Malignant melanomas	1	1	0	3	0	5	4.85	1.25	0.00	2.99	0.00	1.29	1.32
XIe.Skin carcinomas	0	0	1	1	0	2	0.00	0.00	1.04	1.00	0.00	0.52	0.51
XIf.Other and unspecified carcinomas	3	3	4	11	10	31	14.56	3.75	4.15	10.97	10.99	7.99	7.60
XII.Other and unspecified malignant neoplasms	**3**	**20**	**16**	**15**	**13**	**67**	**14.56**	**25.03**	**16.59**	**14.96**	**14.28**	**17.26**	**17.77**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIIb.Other and unspecified malignant tumors	3	20	16	15	13	67	14.56	25.03	16.59	14.96	14.28	17.26	17.77
All Neoplasms	**16**	**147**	**143**	**139**	**116**	**561**	**77.67**	**183.98**	**148.30**	**138.66**	**127.46**	**144.52**	**146.63**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
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Table 26. Absolute incidence by sex and type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Distrito Federal, 1999 to 2002*

Pediatric Tumors - Groups	Male								Female							
	Number of cases						Rates per million		Number of cases						Rates per million	
	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*
I.Leukemia	**1**	**20**	**16**	**15**	**9**	**61**	**31.60**	**32.57**	**1**	**16**	**19**	**8**	**2**	**46**	**23.57**	**25.80**
Ia.Lymphoid leukemia	1	16	9	12	4	42	21.76	22.74	0	14	14	5	0	33	16.91	18.97
Ib.Acute myeloid leukemia	0	4	3	1	3	11	5.70	5.87	1	1	3	2	0	7	3.59	3.84
Ic.Chronic myeloproliferative diseases	0	0	0	1	0	1	0.52	0.47	0	0	1	0	2	3	1.54	1.34
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	2	0	2	4	2.07	1.95	0	1	0	0	0	1	0.51	0.64
Ie.Unspecified and other specified leukemias	0	0	2	1	0	3	1.55	1.55	0	0	1	1	0	2	1.02	1.02
II.Lymphomas and reticuloendothelial neoplasms	**0**	**9**	**21**	**17**	**15**	**62**	**32.12**	**31.41**	**0**	**7**	**8**	**3**	**8**	**26**	**13.32**	**13.43**
IIa.Hodgkin lymphomas	0	1	8	6	4	19	9.84	9.49	0	1	4	1	3	9	4.61	4.49
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	5	9	10	10	34	17.61	17.00	0	5	3	1	4	13	6.66	6.89
IIc.Burkitt lymphoma	0	2	3	1	1	7	3.63	3.76	0	1	0	1	0	2	1.02	1.11
IId.Miscellaneous lymphoreticular neoplasms	0	1	0	0	0	1	0.52	0.62	0	0	1	0	0	1	0.51	0.55
IIe.Unspecified lymphomas	0	0	1	0	0	1	0.52	0.54	0	0	0	0	1	1	0.51	0.40
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**1**	**11**	**13**	**13**	**10**	**48**	**24.87**	**24.88**	**1**	**8**	**15**	**12**	**8**	**44**	**22.55**	**22.74**
IIIa.Ependymomas and choroid plexus tumor	0	1	0	0	0	1	0.52	0.62	0	1	0	0	0	1	0.51	0.64
IIIb.Astrocytomas	1	2	6	6	3	18	9.32	9.20	0	4	7	7	1	19	9.74	10.07
IIIc.Intracranial and intraspinal embryonal tumors	0	3	3	2	1	9	4.66	4.85	0	0	1	2	0	3	1.54	1.49
IIId.Other gliomas	0	0	1	2	1	4	2.07	1.92	0	1	0	0	0	1	0.51	0.64
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	0	5	3	3	5	16	8.29	8.30	1	2	7	3	7	20	10.25	9.91
IV.Neuroblastoma and other peripheral nervous cell tumors	**0**	**2**	**1**	**1**	**0**	**4**	**2.07**	**2.25**	**1**	**6**	**5**	**0**	**1**	**13**	**6.66**	**7.59**
IVa.Neuroblastoma and ganglioneuroblastoma	0	2	1	1	0	4	2.07	2.25	1	6	5	0	1	13	6.66	7.59
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
V.Retinoblastoma	**0**	**3**	**0**	**0**	**0**	**3**	**1.55**	**1.86**	**0**	**5**	**0**	**0**	**0**	**5**	**2.56**	**3.20**
VI.Renal tumors	**1**	**8**	**2**	**2**	**0**	**13**	**6.73**	**7.57**	**0**	**14**	**3**	**0**	**0**	**17**	**8.71**	**10.60**
VIa.Nephroblastoma and other nonepithelial renal tumors	1	6	1	2	0	10	5.18	5.79	0	10	3	0	0	13	6.66	8.04
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIc.Unspecified malignant renal tumors	0	2	1	0	0	3	1.55	1.78	0	4	0	0	0	4	2.05	2.56
VII.Hepatic tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**1**	**1**	**0**	**0**	**0**	**2**	**1.02**	**1.26**
VIIa.Hepatoblastoma	0	0	0	0	0	0	0.00	0.00	0	1	0	0	0	1	0.51	0.64
VIIb.Hepatic carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	1	0	0	0	0	1	0.51	0.62
VIII.Malignant bone tumors	**1**	**4**	**3**	**6**	**10**	**24**	**12.43**	**11.87**	**0**	**1**	**2**	**10**	**3**	**16**	**8.20**	**7.61**
VIIIa.Osteosarcomas	0	0	0	0	2	2	1.04	0.87	0	0	1	4	1	6	3.07	2.82
VIIIb.Chondrosarcomas	0	0	0	1	3	4	2.07	1.78	0	0	0	0	0	0	0.00	0.00
VIIIc.Ewing tumor and related sarcomas of bone	0	0	0	2	1	3	1.55	1.38	0	0	0	2	0	2	1.02	0.94
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIe.Unspecified malignant bone tumors	1	4	3	3	4	15	7.77	7.84	0	1	1	4	2	8	4.10	3.85
IX.Soft tissue and other extraosseous sarcomas	**0**	**4**	**5**	**2**	**1**	**12**	**6.22**	**6.54**	**1**	**2**	**2**	**4**	**2**	**11**	**5.64**	**5.66**
IXa.Rhabdomyosarcomas	0	3	3	1	0	7	3.63	3.94	0	1	2	2	1	6	3.07	3.07
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	0	1	1	1	3	1.55	1.44	1	0	0	2	0	3	1.54	1.56
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	1	1	0	0	2	1.04	1.16	0	0	0	0	0	0	0.00	0.00
IXe.Unspecified soft tissue sarcomas	0	0	0	0	0	0	0.00	0.00	0	1	0	0	1	2	1.02	1.04
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**0**	**1**	**2**	**2**	**3**	**8**	**4.14**	**3.94**	**0**	**1**	**3**	**5**	**10**	**19**	**9.74**	**8.58**
Xa.Intracranial and intraspinal germ cell tumors	0	0	1	0	0	1	0.52	0.54	0	0	1	0	0	1	0.51	0.55
Xb.Malignant extracranial and extragonadal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	1	0	0	5	6	3.07	2.62
Xc.Malignant gonadal germ cell tumors	0	0	0	0	1	1	0.52	0.43	0	0	2	2	3	7	3.59	3.22
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	1	1	0.51	0.40
Xe.Other and unspecified malignant gonadal tumors	0	1	1	2	2	6	3.11	2.97	0	0	0	3	1	4	2.05	1.80
XI.Other malignant epithelial neoplasms & malignant melanomas	**1**	**2**	**3**	**14**	**7**	**27**	**13.99**	**13.10**	**3**	**2**	**3**	**9**	**14**	**31**	**15.89**	**14.54**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIb.Thyroid carcinomas	0	0	1	0	3	4	2.07	1.84	0	0	0	4	5	9	4.61	3.85
XIc.Nasopharyngeal carcinomas	0	0	0	4	3	7	3.63	3.19	0	0	0	0	0	0	0.00	0.00
XId.Malignant melanomas	0	0	0	3	0	3	1.55	1.41	1	1	0	0	0	2	1.02	1.26
XIe.Skin carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	1	1	0	2	1.02	1.02
XIf.Other and unspecified carcinomas	1	2	2	7	1	13	6.73	6.65	2	1	2	4	9	18	9.22	8.41
XII.Other and unspecified malignant neoplasms	**2**	**10**	**7**	**7**	**7**	**33**	**17.10**	**17.50**	**1**	**10**	**9**	**8**	**6**	**34**	**17.42**	**18.07**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIIb.Other and unspecified malignant tumors	2	10	7	7	7	33	17.10	17.50	1	10	9	8	6	34	17.42	18.07
All Neoplasms	**7**	**74**	**73**	**79**	**62**	**295**	**152.82**	**153.49**	**9**	**73**	**69**	**59**	**54**	**264**	**135.29**	**139.07**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

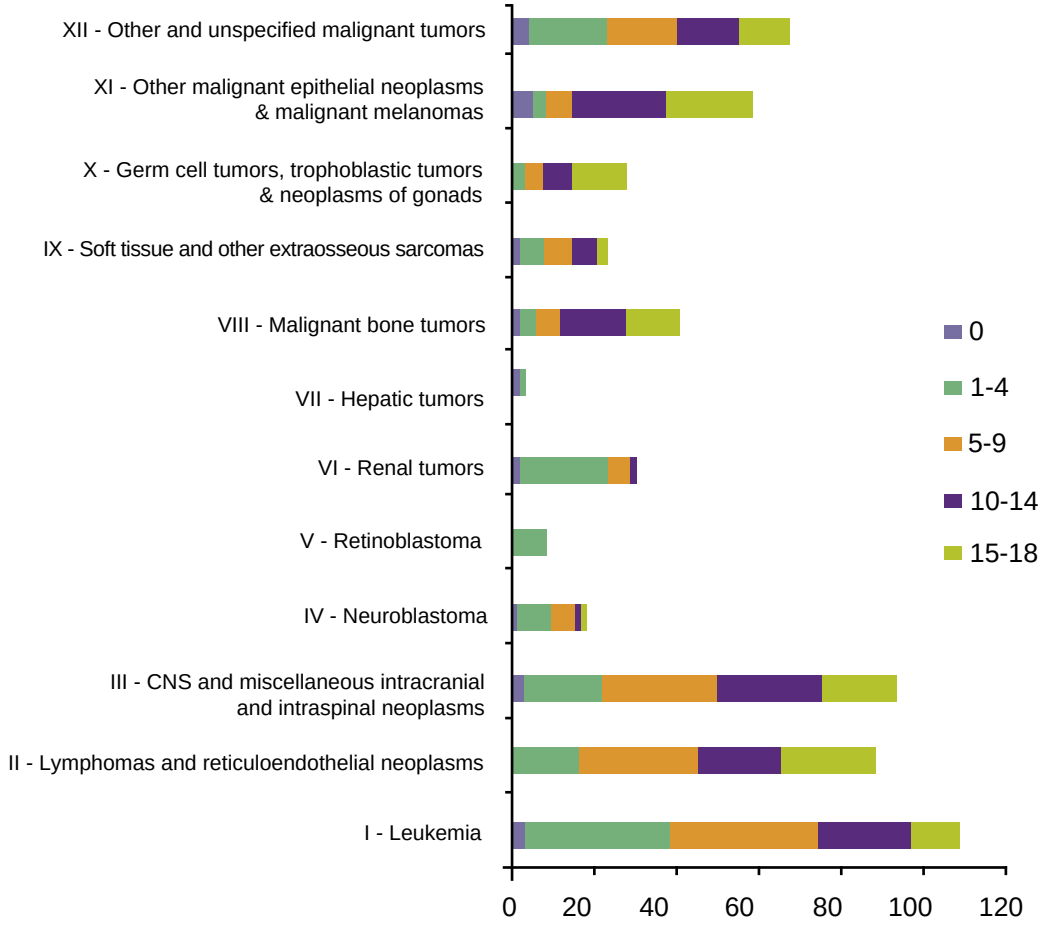

Figure 23. Number of cases by type of childhood cancer, by age group, Distrito Federal, 1999 to 2002

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

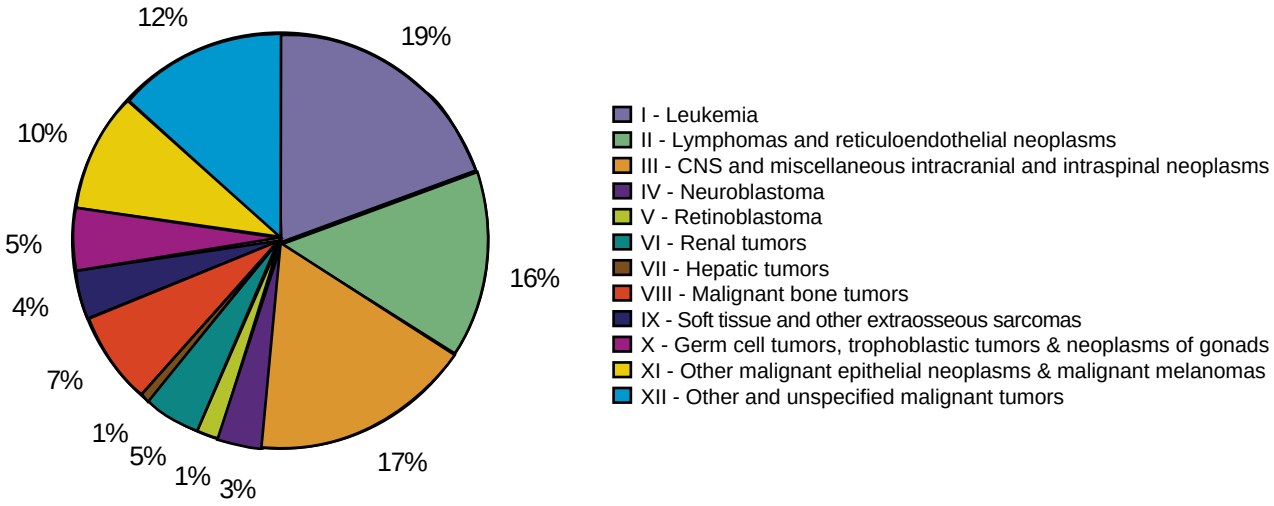

Figure 24. Percentage distribution of incidence by type of childhood cancer, Distrito Federal, 1999 to 2002

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

PBCR of Fortaleza/CE

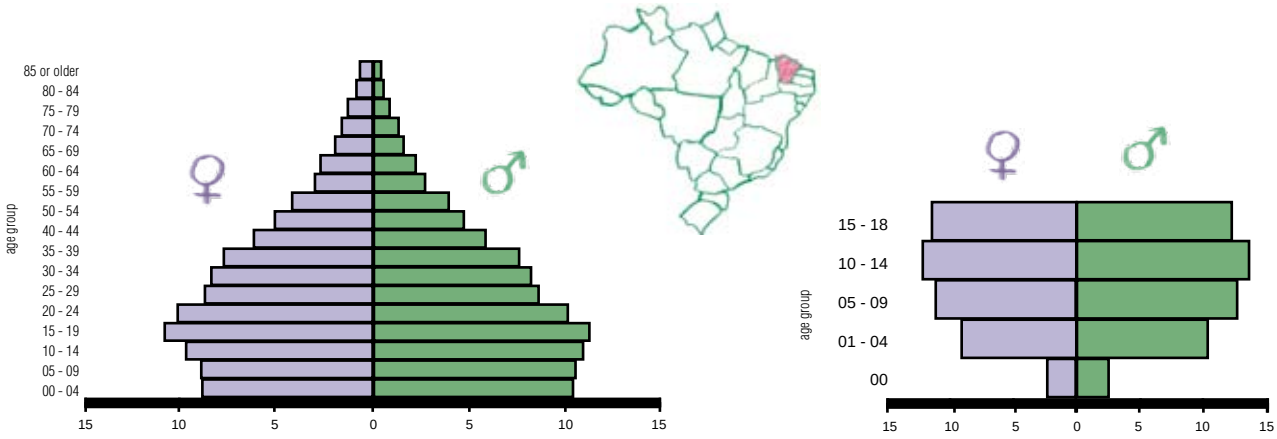

Figure 25. Population Distribution of Fortaleza

*Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Coverage area

The PBCR of Fortaleza covers the municipality of Fortaleza, located in the Northeast Region of Brazil. Fortaleza extends 313,8 Km² and 100% of the population resides in urban areas. The city lies at sea level and the climate is equatorial and intertropical, with an average annual temperature of 27ºC.

Health care facilities for cancer prevention and control

One secondary health unit includes a program for prevention and early detection of cancer. Other cancer diagnostic and treatment unit include one specialized hospital, two general hospitals offering chemotherapy services, one radiotherapy service, three chemotherapy services, and six anatomical pathology laboratories. There are also three universities that offer medical programs and a fourth medical school that is not linked to a university.

Infrastructure and data source

The PBCR was created in 1971, and data collection started in the same year. It is located in the State Department of Health and depends on fixed financial support. The staff includes a coordinator, who is a medical doctor, and four registrars. Active data collection occurs in 41 notifying sources: one specialized hospital, one university hospital, 21 general hospitals, six anatomical pathology laboratories, one radiotherapy service, three chemotherapy services, one secondary unit of cancer prevention and early diagnostic, two maternity wards, two children hospitals, and one nonprofit home. The death certificates are obtained from the Mortality Information System – SIM and the APACs are used for revising cases.

Use of Information

Besides determining the incidence and geographical distribution of cancer in Fortaleza, the information has been used to study temporal trends, data supply for epidemiological studies for administering classes and lectures.

PBCR team – Fortaleza

Coordinator
Miren Maite Uribe Arregi

Registrars
Francisco de Assis Oliveira Falcão
Antonio Jose de Moura
Maria Socorro Bevilaqua
Raimunda Nonata de Paulo

Table 27. Population at risk by sex and age-group from 1998 to 2002

Period: 1998 - 2002	Age-group	Male	Female
	< 1	106,238	101,017
	1-4	429,448	416,051
	5-9	535,934	519,998
	10-14	557,544	566,194
	15-18	446,893	495,062
Total	0 to 18	2,076,057	2,098,322
Annual Average	0 to 18	415,211	419,664

Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE)

Table 28. Absolute incidence by type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Fortaleza, 1998 to 2002*

Pediatric Tumors - Groups	Number of cases						Rates per million						
	0	1-4	5-9	10-14	15-18	0-18	0	1-4	5-9	10-14	15-18	Crude	Adjusted*
I.Leukemia	**7**	**46**	**44**	**38**	**21**	**156**	**33.77**	**54.41**	**41.67**	**33.82**	**22.29**	**37.37**	**38.87**
Ia.Lymphoid leukemia	2	31	26	22	11	92	9.65	36.66	24.62	19.58	11.68	22.04	23.08
Ib.Acute myeloid leukemia	2	5	13	12	4	36	9.65	5.91	12.31	10.68	4.25	8.62	8.63
Ic.Chronic myeloproliferative diseases	0	0	0	1	2	3	0.00	0.00	0.00	0.89	2.12	0.72	0.61
Id.Myelodysplastic syndrome and other myeloproliferative diseases	2	1	0	0	0	3	9.65	1.18	0.00	0.00	0.00	0.72	0.90
Ie.Unspecified and other specified leukemias	1	9	5	3	4	22	4.82	10.64	4.74	2.67	4.25	5.27	5.65
II.Lymphomas and reticuloendothelial neoplasms	**1**	**13**	**14**	**18**	**34**	**80**	**4.82**	**15.38**	**13.26**	**16.02**	**36.10**	**19.16**	**18.22**
IIa.Hodgkin lymphomas	0	3	5	12	19	39	0.00	3.55	4.74	10.68	20.17	9.34	8.45
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	1	6	5	4	12	28	4.82	7.10	4.74	3.56	12.74	6.71	6.57
IIc.Burkitt lymphoma	0	4	0	0	0	4	0.00	4.73	0.00	0.00	0.00	0.96	1.19
IId.Miscellaneous lymphoreticular neoplasms	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIe.Unspecified lymphomas	0	0	4	2	3	9	0.00	0.00	3.79	1.78	3.18	2.16	2.01
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**0**	**9**	**16**	**17**	**15**	**57**	**0.00**	**10.64**	**15.15**	**15.13**	**15.92**	**13.65**	**13.21**
IIIa.Ependymomas and choroid plexus tumor	0	0	1	0	2	3	0.00	0.00	0.95	0.00	2.12	0.72	0.65
IIIb.Astrocytomas	0	2	4	2	5	13	0.00	2.37	3.79	1.78	5.31	3.11	3.01
IIIc.Intracranial and intraspinal embryonal tumors	0	3	2	4	1	10	0.00	3.55	1.89	3.56	1.06	2.40	2.43
IIId.Other gliomas	0	0	0	2	1	3	0.00	0.00	0.00	1.78	1.06	0.72	0.62
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	0	4	9	9	6	28	0.00	4.73	8.52	8.01	6.37	6.71	6.51
IV.Neuroblastoma and other peripheral nervous cell tumors	**0**	**5**	**1**	**1**	**0**	**7**	**0.00**	**5.91**	**0.95**	**0.89**	**0.00**	**1.68**	**1.94**
IVa.Neuroblastoma and ganglioneuroblastoma	0	5	1	1	0	7	0.00	5.91	0.95	0.89	0.00	1.68	1.94
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
V.Retinoblastoma	**2**	**6**	**2**	**0**	**0**	**10**	**9.65**	**7.10**	**1.89**	**0.00**	**0.00**	**2.40**	**2.89**
VI.Renal tumors	**1**	**13**	**5**	**1**	**1**	**21**	**4.82**	**15.38**	**4.74**	**0.89**	**1.06**	**5.03**	**5.82**
VIa.Nephroblastoma and other nonepithelial renal tumors	1	13	4	0	1	19	4.82	15.38	3.79	0.00	1.06	4.55	5.36
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIc.Unspecified malignant renal tumors	0	0	1	1	0	2	0.00	0.00	0.95	0.89	0.00	0.48	0.46
VII.Hepatic tumors	**0**	**0**	**1**	**0**	**0**	**1**	**0.00**	**0.00**	**0.95**	**0.00**	**0.00**	**0.24**	**0.25**
VIIa.Hepatoblastoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIb.Hepatic carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	0	0	1	0	0	1	0.00	0.00	0.95	0.00	0.00	0.24	0.25
VIII.Malignant bone tumors	**0**	**4**	**6**	**13**	**21**	**44**	**0.00**	**4.73**	**5.68**	**11.57**	**22.29**	**10.54**	**9.60**
VIIIa.Osteosarcomas	0	0	1	10	15	26	0.00	0.00	0.95	8.90	15.92	6.23	5.35
VIIIb.Chondrosarcomas	0	0	0	1	1	2	0.00	0.00	0.00	0.89	1.06	0.48	0.41
VIIIc.Ewing tumor and related sarcomas of bone	0	2	2	1	0	5	0.00	2.37	1.89	0.89	0.00	1.20	1.30
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	2	3	1	5	11	0.00	2.37	2.84	0.89	5.31	2.64	2.55
IX.Soft tissue and other extraosseous sarcomas	**0**	**6**	**8**	**3**	**11**	**28**	**0.00**	**7.10**	**7.58**	**2.67**	**11.68**	**6.71**	**6.60**
IXa.Rhabdomyosarcomas	0	5	7	2	5	19	0.00	5.91	6.63	1.78	5.31	4.55	4.64
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	0	0	0	4	4	0.00	0.00	0.00	0.00	4.25	0.96	0.80
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	1	0	1	2	4	0.00	1.18	0.00	0.89	2.12	0.96	0.91
IXe.Unspecified soft tissue sarcomas	0	0	1	0	0	1	0.00	0.00	0.95	0.00	0.00	0.24	0.25
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**1**	**0**	**1**	**5**	**11**	**18**	**4.82**	**0.00**	**0.95**	**4.45**	**11.68**	**4.31**	**3.80**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	1	1	0.00	0.00	0.00	0.00	1.06	0.24	0.20
Xb.Malignant extracranial and extragonadal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xc.Malignant gonadal germ cell tumors	0	0	1	4	6	11	0.00	0.00	0.95	3.56	6.37	2.64	2.29
Xd.Gonadal carcinomas	1	0	0	0	3	4	4.82	0.00	0.00	0.00	3.18	0.96	0.90
Xe.Other and unspecified malignant gonadal tumors	0	0	0	1	1	2	0.00	0.00	0.00	0.89	1.06	0.48	0.41
XI.Other malignant epithelial neoplasms & malignant melanomas	**2**	**2**	**3**	**12**	**35**	**54**	**9.65**	**2.37**	**2.84**	**10.68**	**37.16**	**12.94**	**11.46**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIb.Thyroid carcinomas	0	1	2	5	8	16	0.00	1.18	1.89	4.45	8.49	3.83	3.44
XIc.Nasopharyngeal carcinomas	0	0	0	1	3	4	0.00	0.00	0.00	0.89	3.18	0.96	0.81
XId.Malignant melanomas	0	0	1	2	0	3	0.00	0.00	0.95	1.78	0.00	0.72	0.67
XIe.Skin carcinomas	0	0	0	0	5	5	0.00	0.00	0.00	0.00	5.31	1.20	1.00
XIf.Other and unspecified carcinomas	2	1	0	4	19	26	9.65	1.18	0.00	3.56	20.17	6.23	5.54
XII.Other and unspecified malignant neoplasms	**3**	**18**	**9**	**11**	**18**	**59**	**14.47**	**21.29**	**8.52**	**9.79**	**19.11**	**14.13**	**14.40**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIIb.Other and unspecified malignant tumors	3	18	9	11	18	59	14.47	21.29	8.52	9.79	19.11	14.13	14.40
All Neoplasms	**17**	**122**	**110**	**119**	**167**	**535**	**82.02**	**144.29**	**104.17**	**105.90**	**177.29**	**128.16**	**127.05**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

Table 29. Absolute incidence by sex and type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Fortaleza, 1998 to 2002*

Pediatric Tumors - Groups	Male								Female							
	Number of cases						Rates per million		Number of cases						Rates per million	
	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*
I.Leukemia	**5**	**22**	**20**	**25**	**8**	**80**	**38.53**	**39.54**	**2**	**24**	**24**	**13**	**12**	**75**	**35.74**	**37.80**
Ia.Lymphoid leukemia	1	14	12	15	5	47	22.64	23.09	1	17	14	7	6	45	21.45	23.14
Ib.Acute myeloid leukemia	1	3	6	8	1	19	9.15	9.08	1	2	7	4	3	17	8.10	8.16
Ic.Chronic myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0	0	0	1	1	2	0.95	0.80
Id.Myelodysplastic syndrome and other myeloproliferative diseases	2	1	0	0	0	3	1.45	1.77	0	0	0	0	0	0	0.00	0.00
Ie.Unspecified and other specified leukemias	1	4	2	2	2	11	5.30	5.60	0	5	3	1	2	11	5.24	5.71
II.Lymphomas and reticuloendothelial neoplasms	**2**	**8**	**9**	**10**	**22**	**51**	**24.57**	**23.76**	**0**	**4**	**5**	**8**	**12**	**29**	**13.82**	**12.83**
IIa.Hodgkin lymphomas	1	0	3	5	11	20	9.63	8.81	0	2	2	7	8	19	9.05	8.17
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	1	4	3	3	8	19	9.15	9.04	0	2	2	1	4	9	4.29	4.15
IIc.Burkitt lymphoma	0	4	0	0	0	4	1.93	2.34	0	0	0	0	0	0	0.00	0.00
IId.Miscellaneous lymphoreticular neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIe.Unspecified lymphomas	0	0	3	2	3	8	3.85	3.58	0	0	1	0	0	1	0.48	0.50
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**0**	**5**	**11**	**5**	**7**	**28**	**13.49**	**13.36**	**0**	**4**	**5**	**12**	**8**	**29**	**13.82**	**12.97**
IIIa.Ependymomas and choroid plexus tumor	0	0	1	0	2	3	1.45	1.33	0	0	0	0	0	0	0.00	0.00
IIIb.Astrocytomas	0	1	4	2	3	10	4.82	4.65	0	1	0	0	2	3	1.43	1.37
IIIc.Intracranial and intraspinal embryonal tumors	0	2	2	1	0	5	2.41	2.57	0	1	0	3	1	5	2.38	2.23
IIId.Other gliomas	0	0	0	0	0	0	0.00	0.00	0	0	0	2	1	3	1.43	1.21
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	0	2	4	2	2	10	4.82	4.81	0	2	5	7	4	18	8.58	8.16
IV.Neuroblastoma and other peripheral nervous cell tumors	**0**	**3**	**0**	**1**	**0**	**4**	**1.93**	**2.18**	**0**	**2**	**1**	**0**	**0**	**3**	**1.43**	**1.71**
IVa.Neuroblastoma and ganglioneuroblastoma	0	3	0	1	0	4	1.93	2.18	0	2	1	0	0	3	1.43	1.71
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
V.Retinoblastoma	**1**	**2**	**1**	**0**	**0**	**4**	**1.93**	**2.25**	**1**	**4**	**1**	**0**	**0**	**6**	**2.86**	**3.54**
VI.Renal tumors	**1**	**4**	**2**	**1**	**1**	**9**	**4.34**	**4.75**	**0**	**9**	**3**	**0**	**0**	**12**	**5.72**	**6.95**
VIa.Nephroblastoma and other nonepithelial renal tumors	1	4	2	0	1	8	3.85	4.33	0	9	2	0	0	11	5.24	6.44
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIc.Unspecified malignant renal tumors	0	0	0	1	0	1	0.48	0.42	0	0	1	0	0	1	0.48	0.50
VII.Hepatic tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**1**	**0**	**0**	**1**	**0.48**	**0.50**
VIIa.Hepatoblastoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIb.Hepatic carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0	0	1	0	0	1	0.48	0.50
VIII.Malignant bone tumors	**0**	**1**	**4**	**6**	**11**	**22**	**10.60**	**9.71**	**0**	**3**	**1**	**7**	**10**	**21**	**10.01**	**9.04**
VIIIa.Osteosarcomas	0	0	0	4	8	12	5.78	5.06	0	0	1	6	7	14	6.67	5.67
VIIIb.Chondrosarcomas	0	0	0	1	0	1	0.48	0.42	0	0	0	0	1	1	0.48	0.38
VIIIc.Ewing tumor and related sarcomas of bone	0	0	2	0	0	2	0.96	0.98	0	2	0	1	0	3	1.43	1.62
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	1	2	1	3	7	3.37	3.25	0	1	0	0	2	3	1.43	1.37
IX.Soft tissue and other extraosseous sarcomas	**0**	**3**	**4**	**1**	**7**	**15**	**7.23**	**7.08**	**0**	**3**	**4**	**2**	**4**	**13**	**6.20**	**6.18**
IXa.Rhabdomyosarcomas	0	2	4	1	3	10	4.82	4.81	0	3	3	1	2	9	4.29	4.50
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	0	0	0	3	3	1.45	1.27	0	0	0	0	1	1	0.48	0.38
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	1	0	0	1	2	0.96	1.01	0	0	0	1	1	2	0.95	0.80
IXe.Unspecified soft tissue sarcomas	0	0	0	0	0	0	0.00	0.00	0	0	1	0	0	1	0.48	0.50
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**0**	**0**	**0**	**0**	**2**	**2**	**0.96**	**0.84**	**1**	**0**	**1**	**5**	**9**	**16**	**7.63**	**6.63**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	1	1	0.48	0.42	0	0	0	0	0	0	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xc.Malignant gonadal germ cell tumors	0	0	0	0	1	1	0.48	0.42	0	0	1	4	5	10	4.77	4.07
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	1	0	0	0	3	4	1.91	1.76
Xe.Other and unspecified malignant gonadal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	1	1	2	0.95	0.80
XI.Other malignant epithelial neoplasms & malignant melanomas	**0**	**1**	**1**	**3**	**8**	**13**	**6.26**	**5.72**	**2**	**1**	**2**	**9**	**27**	**41**	**19.54**	**16.88**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIb.Thyroid carcinomas	0	0	0	1	0	1	0.48	0.42	0	1	2	4	8	15	7.15	6.32
XIc.Nasopharyngeal carcinomas	0	0	0	1	0	1	0.48	0.42	0	0	0	0	3	3	1.43	1.14
XId.Malignant melanomas	0	0	1	1	0	2	0.96	0.91	0	0	0	1	0	1	0.48	0.42
XIe.Skin carcinomas	0	0	0	0	1	1	0.48	0.42	0	0	0	0	4	4	1.91	1.52
XIf.Other and unspecified carcinomas	0	1	0	0	7	8	3.85	3.54	2	0	0	4	12	18	8.58	7.48
XII.Other and unspecified malignant neoplasms	**2**	**9**	**5**	**6**	**6**	**28**	**13.49**	**13.96**	**1**	**9**	**4**	**5**	**12**	**31**	**14.77**	**14.72**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIIb.Other and unspecified malignant tumors	2	9	5	6	6	28	13.49	13.96	1	9	4	5	12	31	14.77	14.72
All Neoplasms	**11**	**58**	**57**	**58**	**72**	**256**	**123.31**	**123.16**	**7**	**63**	**52**	**61**	**94**	**277**	**132.01**	**129.76**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

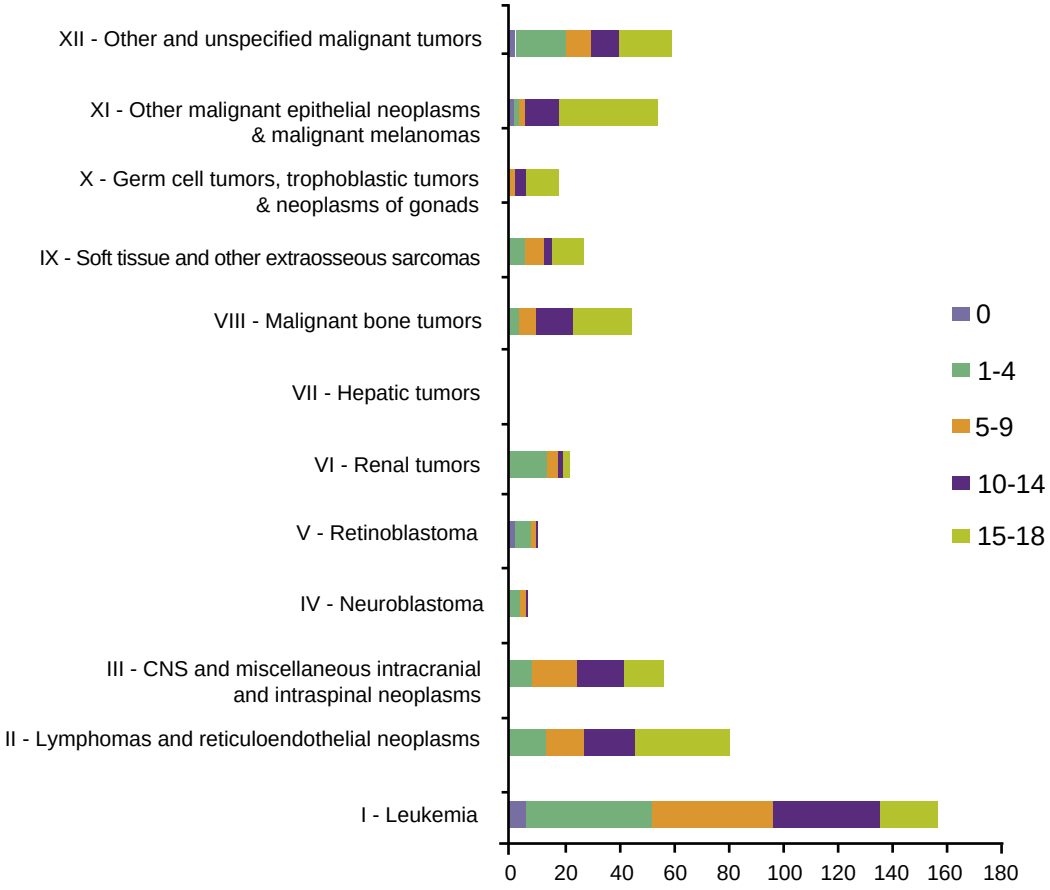

Figure 26. Number of cases by type of childhood cancer, by age group, Fortaleza, 1998 to 2002

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

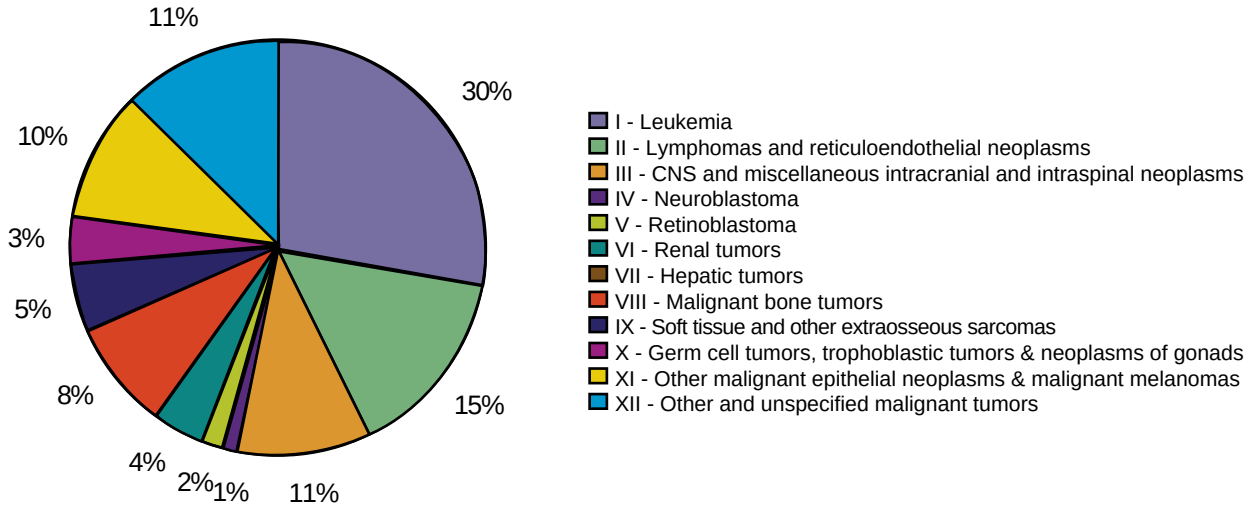

Figure 27. Percentage distribution of incidence by type of childhood cancer, Fortaleza, 1998 to 2002

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

PBCR of Goiânia/GO

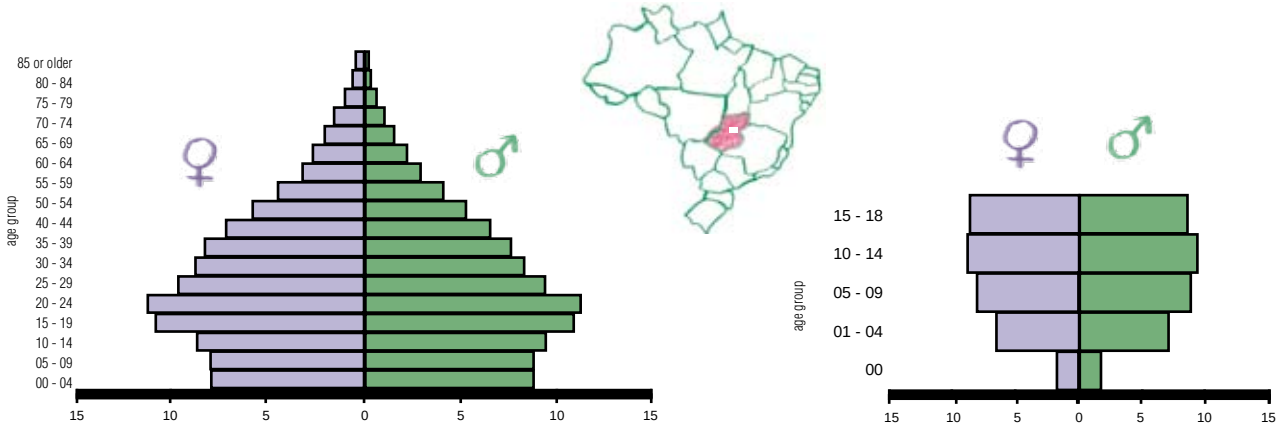

Figure 28. Population Distribution of Goiânia

*Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Coverage area

The PBCR of Goiânia covers the municipality of Goiânia, located in the Middle West Region of Brazil. Goiânia has an extended area of 801.02 Km². Between 1996 and 2007, the urban population varied from 1,003,477 to 1,244,645 inhabitants. About 97.39% of the population resides in urban areas, with an annual growth rate of 1.9%. The municipality of Goiânia lies 800m above sea level and it has a tropical climate, with an average annual temperature of 30ºC.

Health care facilities for cancer prevention and control

Health programs and services in the state of Goiás are offered by 468 public or private hospitals, with 18,953 hospital beds (4.5 per 1000 inhabitants). There are five healthcare units for cancer prevention and early detection. For cancer diagnosis and treatment, there are two radiotherapy services and eleven chemotherapy services.

Data collection actively occurs in 340 notifying sources: four public hospitals, two philanthropic hospitals, 43 private hospitals, 33 anatomical pathology laboratories, 120 clinical analysis laboratories, and 138 consulting rooms. The death certificates are taken from the Mortality Information System – SIM of the State Department of Health of Goiás and the Municipal Department of Health of Goiânia. In Goiânia, there are two medical programs: one in the Federal University of Goiás and another in the Catholic University.

Infrastructure and data source

The PBCR of Goiás was created in the State Department of Health in 1986. Data collection started in the same year and was transferred to the Association for Cancer Combat (ACCG/ Araújo Jorge Hospital) in 1993. The PBCR-GO depends on physical, financial and personnel support from the ACCG since 1994. The registry's staff includes a coordinator – oncologist, a supervisor – epidemiologist, one codifier, three registrars and one intern. The advisory board is composed of six oncologists.

Use of Information

The information helps determine the incidence and mortality rates of cancer in Goiânia. The information is made available for clinical investigation and multicentre researches. The State Department of Health employs the information as a managerial instrument for public health.

PBCR Team – Goiânia

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Collaborator
Dr. Maria Paula Curado

Supervisor
Edesio Martins

Codifier
Carleane Maciel Bandeira

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Anderson Gomes de Oliveira
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Matinair Siqueira Mineiro

Intern
Diego Rodrigues Mendonça e Silva

Advisory Board
Antônio Gomes Teles
Elbio Cândido de Paula
Elecy Messias de Oliveira
Nildes Ferreira Borges
Ruffo de Freitas Júnior
Sormany Del Carmo

Table 30. Population at risk by sex and age-group from 1999 to 2003

Period: 1999 - 2003	Age-group	Male	Female
	< 1	47,027	44,980
	1-4	189,040	182,948
	5-9	238,317	231,981
	10-14	255,428	254,018
	15-18	230,238	247,088
Total	0 to 18	960,050	961,015
Annual Average	0 to 18	192,010	192,203

Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Table 31. Absolute incidence by type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Goiânia, 1999 to 2003*

Pediatric Tumors - Groups	Number of cases						Rates per million						
	0	1-4	5-9	10-14	15-18	0-18	0	1-4	5-9	10-14	15-18	Crude	Adjusted*
I.Leukemia	**5**	**35**	**35**	**24**	**25**	**124**	**54.34**	**94.09**	**74.42**	**47.11**	**52.38**	**64.55**	**67.51**
Ia.Lymphoid leukemia	3	24	27	14	16	84	32.61	64.52	57.41	27.48	33.52	43.73	46.08
Ib.Acute myeloid leukemia	1	7	5	8	6	27	10.87	18.82	10.63	15.70	12.57	14.05	14.26
Ic.Chronic myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	1	0	1	2	0.00	0.00	2.13	0.00	2.10	1.04	0.95
Ie.Unspecified and other specified leukemias	1	4	2	2	2	11	10.87	10.75	4.25	3.93	4.19	5.73	6.21
II.Lymphomas and reticuloendothelial neoplasms	**0**	**17**	**15**	**14**	**20**	**66**	**0.00**	**45.70**	**31.89**	**27.48**	**41.90**	**34.36**	**34.21**
IIa.Hodgkin lymphomas	0	1	8	7	11	27	0.00	2.69	17.01	13.74	23.05	14.05	12.71
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	6	1	0	2	9	0.00	16.13	2.13	0.00	4.19	4.68	5.40
IIc.Burkitt lymphoma	0	2	3	3	1	9	0.00	5.38	6.38	5.89	2.10	4.68	4.80
IId.Miscellaneous lymphoreticular neoplasms	0	3	0	0	0	3	0.00	8.06	0.00	0.00	0.00	1.56	2.03
IIe.Unspecified lymphomas	0	5	3	4	6	18	0.00	13.44	6.38	7.85	12.57	9.37	9.27
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**5**	**7**	**26**	**10**	**12**	**60**	**54.34**	**18.82**	**55.28**	**19.63**	**25.14**	**31.23**	**31.98**
IIIa.Ependymomas and choroid plexus tumor	1	2	2	1	1	7	10.87	5.38	4.25	1.96	2.10	3.64	4.00
IIIb.Astrocytomas	2	3	5	6	7	23	21.74	8.06	10.63	11.78	14.67	11.97	11.71
IIIc.Intracranial and intraspinal embryonal tumors	0	0	3	1	1	5	0.00	0.00	6.38	1.96	2.10	2.60	2.53
IIId.Other gliomas	0	1	8	1	1	11	0.00	2.69	17.01	1.96	2.10	5.73	5.99
IIIe.Other specified intracranial and intraspinal neoplasms	1	0	5	1	1	8	10.87	0.00	10.63	1.96	2.10	4.16	4.32
IIIf.Unspecified intracranial and intraspinal neoplasms	1	1	3	0	1	6	10.87	2.69	6.38	0.00	2.10	3.12	3.42
IV.Neuroblastoma and other peripheral nervous cell tumors	**2**	**7**	**5**	**1**	**0**	**15**	**21.74**	**18.82**	**10.63**	**1.96**	**0.00**	**7.81**	**9.34**
IVa.Neuroblastoma and ganglioneuroblastoma	2	7	4	1	0	14	21.74	18.82	8.51	1.96	0.00	7.29	8.78
IVb.Other peripheral nervous cell tumors	0	0	1	0	0	1	0.00	0.00	2.13	0.00	0.00	0.52	0.56
V.Retinoblastoma	**3**	**7**	**0**	**0**	**0**	**10**	**32.61**	**18.82**	**0.00**	**0.00**	**0.00**	**5.21**	**6.78**
VI.Renal tumors	**5**	**12**	**6**	**1**	**0**	**24**	**54.34**	**32.26**	**12.76**	**1.96**	**0.00**	**12.49**	**15.32**
VIa.Nephroblastoma and other nonepithelial renal tumors	4	12	6	1	0	23	43.47	32.26	12.76	1.96	0.00	11.97	14.64
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIc.Unspecified malignant renal tumors	1	0	0	0	0	1	10.87	0.00	0.00	0.00	0.00	0.52	0.68
VII.Hepatic tumors	**0**	**2**	**1**	**1**	**1**	**5**	**0.00**	**5.38**	**2.13**	**1.96**	**2.10**	**2.60**	**2.77**
VIIa.Hepatoblastoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIb.Hepatic carcinomas	0	2	1	1	1	5	0.00	5.38	2.13	1.96	2.10	2.60	2.77
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIII.Malignant bone tumors	**1**	**1**	**4**	**14**	**15**	**35**	**10.87**	**2.69**	**8.51**	**27.48**	**31.43**	**18.22**	**15.98**
VIIIa.Osteosarcomas	0	1	2	7	6	16	0.00	2.69	4.25	13.74	12.57	8.33	7.40
VIIIb.Chondrosarcomas	0	0	0	1	1	2	0.00	0.00	0.00	1.96	2.10	1.04	0.86
VIIIc.Ewing tumor and related sarcomas of bone	0	0	2	6	5	13	0.00	0.00	4.25	11.78	10.48	6.77	5.86
VIIId.Other specified malignant bone tumors	0	0	0	0	2	2	0.00	0.00	0.00	0.00	4.19	1.04	0.79
VIIIe.Unspecified malignant bone tumors	1	0	0	0	1	2	10.87	0.00	0.00	0.00	2.10	1.04	1.08
IX.Soft tissue and other extraosseous sarcomas	**1**	**9**	**5**	**5**	**9**	**29**	**10.87**	**24.19**	**10.63**	**9.81**	**18.86**	**15.10**	**15.41**
IXa.Rhabdomyosarcomas	0	6	3	3	4	16	0.00	16.13	6.38	5.89	8.38	8.33	8.69
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	0	1	0	2	3	0.00	0.00	2.13	0.00	4.19	1.56	1.35
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXd.Other specified soft tissue sarcomas	1	3	0	2	3	9	10.87	8.06	0.00	3.93	6.29	4.68	4.82
IXe.Unspecified soft tissue sarcomas	0	0	1	0	0	1	0.00	0.00	2.13	0.00	0.00	0.52	0.56
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**2**	**3**	**2**	**2**	**6**	**15**	**21.74**	**8.06**	**4.25**	**3.93**	**12.57**	**7.81**	**7.80**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	1	2	0	1	2	6	10.87	5.38	0.00	1.96	4.19	3.12	3.29
Xc.Malignant gonadal germ cell tumors	1	1	1	1	4	8	10.87	2.69	2.13	1.96	8.38	4.16	3.96
Xd.Gonadal carcinomas	0	0	1	0	0	1	0.00	0.00	2.13	0.00	0.00	0.52	0.56
Xe.Other and unspecified malignant gonadal tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XI.Other malignant epithelial neoplasms & malignant melanomas	**1**	**1**	**4**	**6**	**30**	**42**	**10.87**	**2.69**	**8.51**	**11.78**	**62.85**	**21.86**	**18.21**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIb.Thyroid carcinomas	0	0	0	1	10	11	0.00	0.00	0.00	1.96	20.95	5.73	4.41
XIc.Nasopharyngeal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XId.Malignant melanomas	0	0	0	0	2	2	0.00	0.00	0.00	0.00	4.19	1.04	0.79
XIe.Skin carcinomas	1	1	4	3	7	16	10.87	2.69	8.51	5.89	14.67	8.33	7.74
XIf.Other and unspecified carcinomas	0	0	0	2	11	13	0.00	0.00	0.00	3.93	23.05	6.77	5.27
XII.Other and unspecified malignant neoplasms	**4**	**1**	**1**	**2**	**2**	**10**	**43.47**	**2.69**	**2.13**	**3.93**	**4.19**	**5.21**	**5.68**
XIIa.Other specified malignant tumors	1	0	0	0	0	1	10.87	0.00	0.00	0.00	0.00	0.52	0.68
XIIb.Other and unspecified malignant tumors	3	1	1	2	2	9	32.61	2.69	2.13	3.93	4.19	4.68	5.00
All Neoplasms	**29**	**102**	**104**	**80**	**120**	**435**	**315.19**	**274.20**	**221.14**	**157.03**	**251.40**	**226.44**	**230.98**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

Table 32. Absolute incidence by sex and type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Goiânia, 1999 to 2003*

Pediatric Tumors - Groups	Male								Female							
	Number of cases						Rates per million		Number of cases						Rates per million	
	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*
I.Leukemia	**1**	**22**	**22**	**11**	**13**	**69**	**71.87**	**75.54**	**4**	**13**	**13**	**13**	**12**	**55**	**57.23**	**59.33**
Ia.Lymphoid leukemia	1	16	18	8	9	52	54.16	57.13	2	8	9	6	7	32	33.30	34.84
Ib.Acute myeloid leukemia	0	5	1	3	4	13	13.54	13.79	1	2	4	5	2	14	14.57	14.82
Ic.Chronic myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	1	0	0	1	1.04	1.10	0	0	0	0	1	1	1.04	0.76
Ie.Unspecified and other specified leukemias	0	1	2	0	0	3	3.12	3.53	1	3	0	2	2	8	8.32	8.90
II.Lymphomas and reticuloendothelial neoplasms	**0**	**13**	**12**	**10**	**13**	**48**	**50.00**	**50.33**	**0**	**4**	**3**	**4**	**7**	**18**	**18.73**	**17.93**
IIa.Hodgkin lymphomas	0	1	7	6	6	20	20.83	19.46	0	0	1	1	5	7	7.28	5.87
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	4	0	0	1	5	5.21	6.14	0	2	1	0	1	4	4.16	4.64
IIc.Burkitt lymphoma	0	2	3	2	1	8	8.33	8.62	0	0	0	1	0	1	1.04	0.93
IId.Miscellaneous lymphoreticular neoplasms	0	2	0	0	0	2	2.08	2.66	0	1	0	0	0	1	1.04	1.37
IIe.Unspecified lymphomas	0	4	2	2	5	13	13.54	13.45	0	1	1	2	1	5	5.20	5.12
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**3**	**4**	**10**	**3**	**7**	**27**	**28.12**	**28.81**	**2**	**3**	**16**	**7**	**5**	**33**	**34.34**	**35.28**
IIIa.Ependymomas and choroid plexus tumor	0	1	1	1	1	4	4.17	4.17	1	1	1	0	0	3	3.12	3.90
IIIb.Astrocytomas	1	2	2	1	4	10	10.42	10.39	1	1	3	5	3	13	13.53	13.08
IIIc.Intracranial and intraspinal embryonal tumors	0	0	2	1	1	4	4.17	3.94	0	0	1	0	0	1	1.04	1.13
IIId.Other gliomas	0	1	3	0	0	4	4.17	4.62	0	0	5	1	1	7	7.28	7.33
IIIe.Other specified intracranial and intraspinal neoplasms	1	0	2	0	1	4	4.17	4.35	0	0	3	1	0	4	4.16	4.31
IIIf.Unspecified intracranial and intraspinal neoplasms	1	0	0	0	0	1	1.04	1.34	0	1	3	0	1	5	5.20	5.52
IV.Neuroblastoma and other peripheral nervous cell tumors	**0**	**4**	**2**	**0**	**0**	**6**	**6.25**	**7.51**	**2**	**3**	**3**	**1**	**0**	**9**	**9.37**	**11.23**
IVa.Neuroblastoma and ganglioneuroblastoma	0	4	2	0	0	6	6.25	7.51	2	3	2	1	0	8	8.32	10.10
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	1	0	0	1	1.04	1.13
V.Retinoblastoma	**1**	**4**	**0**	**0**	**0**	**5**	**5.21**	**6.65**	**2**	**3**	**0**	**0**	**0**	**5**	**5.20**	**6.91**
VI.Renal tumors	**3**	**9**	**3**	**1**	**0**	**16**	**16.67**	**20.19**	**2**	**3**	**3**	**0**	**0**	**8**	**8.32**	**10.30**
VIa.Nephroblastoma and other nonepithelial renal tumors	3	9	3	1	0	16	16.67	20.19	1	3	3	0	0	7	7.28	8.90
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIc.Unspecified malignant renal tumors	0	0	0	0	0	0	0.00	0.00	1	0	0	0	0	1	1.04	1.40
VII.Hepatic tumors	**0**	**1**	**0**	**1**	**1**	**3**	**3.12**	**3.07**	**0**	**1**	**1**	**0**	**0**	**2**	**2.08**	**2.50**
VIIa.Hepatoblastoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIb.Hepatic carcinomas	0	1	0	1	1	3	3.12	3.07	0	1	1	0	0	2	2.08	2.50
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIII.Malignant bone tumors	**0**	**0**	**2**	**11**	**12**	**25**	**26.04**	**22.17**	**1**	**1**	**2**	**3**	**3**	**10**	**10.41**	**10.10**
VIIIa.Osteosarcomas	0	0	1	5	6	12	12.50	10.62	0	1	1	2	0	4	4.16	4.36
VIIIb.Chondrosarcomas	0	0	0	0	1	1	1.04	0.82	0	0	0	1	0	1	1.04	0.93
VIIIc.Ewing tumor and related sarcomas of bone	0	0	1	6	3	10	10.42	9.09	0	0	1	0	2	3	3.12	2.65
VIIId.Other specified malignant bone tumors	0	0	0	0	2	2	2.08	1.64	0	0	0	0	0	0	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	1	0	0	0	1	2	2.08	2.16
IX.Soft tissue and other extraosseous sarcomas	**0**	**3**	**1**	**4**	**3**	**11**	**11.46**	**11.23**	**1**	**6**	**4**	**1**	**6**	**18**	**18.73**	**19.66**
IXa.Rhabdomyosarcomas	0	1	0	2	2	5	5.21	4.81	0	5	3	1	2	11	11.45	12.71
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	0	1	0	0	1	1.04	1.10	0	0	0	0	2	2	2.08	1.53
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	2	0	2	1	5	5.21	5.32	1	1	0	0	2	4	4.16	4.30
IXe.Unspecified soft tissue sarcomas	0	0	0	0	0	0	0.00	0.00	0	0	1	0	0	1	1.04	1.13
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**2**	**2**	**0**	**1**	**3**	**8**	**8.33**	**8.71**	**0**	**1**	**2**	**1**	**3**	**7**	**7.28**	**6.85**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	1	2	0	1	1	5	5.21	5.74	0	0	0	0	1	1	1.04	0.76
Xc.Malignant gonadal germ cell tumors	1	0	0	0	2	3	3.12	2.97	0	1	1	1	2	5	5.20	4.96
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	1	0	0	1	1.04	1.13
Xe.Other and unspecified malignant gonadal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XI.Other malignant epithelial neoplasms & malignant melanomas	**0**	**1**	**1**	**1**	**7**	**10**	**10.42**	**9.08**	**1**	**0**	**3**	**5**	**23**	**32**	**33.30**	**26.96**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIb.Thyroid carcinomas	0	0	0	0	3	3	3.12	2.46	0	0	0	1	7	8	8.32	6.27
XIc.Nasopharyngeal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XId.Malignant melanomas	0	0	0	0	1	1	1.04	0.82	0	0	0	0	1	1	1.04	0.76
XIe.Skin carcinomas	0	1	1	1	1	4	4.17	4.17	1	0	3	2	6	12	12.49	11.21
XIf.Other and unspecified carcinomas	0	0	0	0	2	2	2.08	1.64	0	0	0	2	9	11	11.45	8.72
XII.Other and unspecified malignant neoplasms	**2**	**0**	**1**	**1**	**2**	**6**	**6.25**	**6.33**	**2**	**1**	**0**	**1**	**0**	**4**	**4.16**	**5.09**
XIIa.Other specified malignant tumors	1	0	0	0	0	1	1.04	1.34	0	0	0	0	0	0	0.00	0.00
XIIb.Other and unspecified malignant tumors	1	0	1	1	2	5	5.21	4.99	2	1	0	1	0	4	4.16	5.09
All Neoplasms	**12**	**63**	**54**	**44**	**61**	**234**	**243.74**	**249.62**	**17**	**39**	**50**	**36**	**59**	**201**	**209.15**	**212.14**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

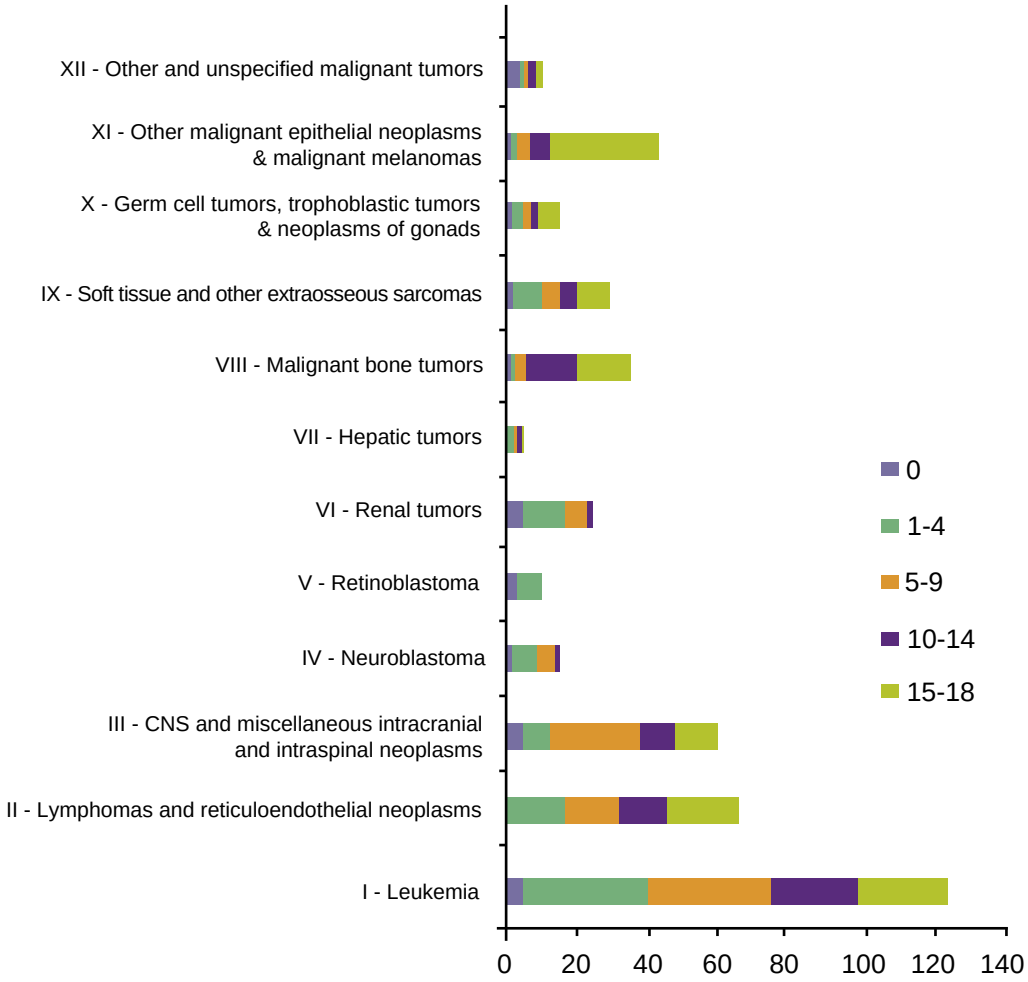

Figure 29. Number of cases by type of childhood cancer, by age-group, Goiânia, 1999 to 2003

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

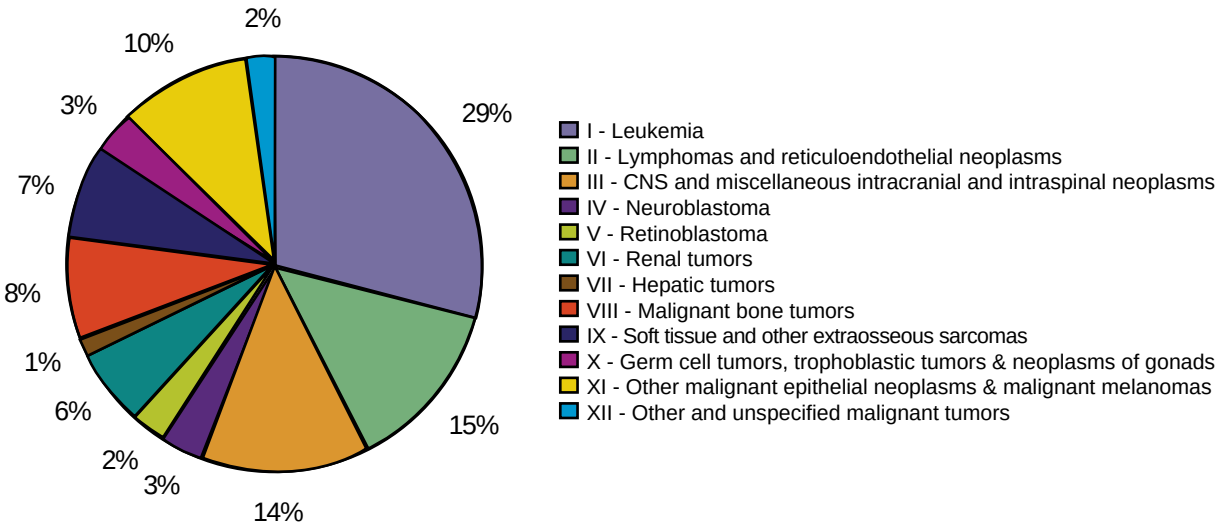

Figure 30. Percentage distribution of incidence by type of childhood cancer, Goiânia, 1999 to 2003

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

PBCR of Jaú/SP

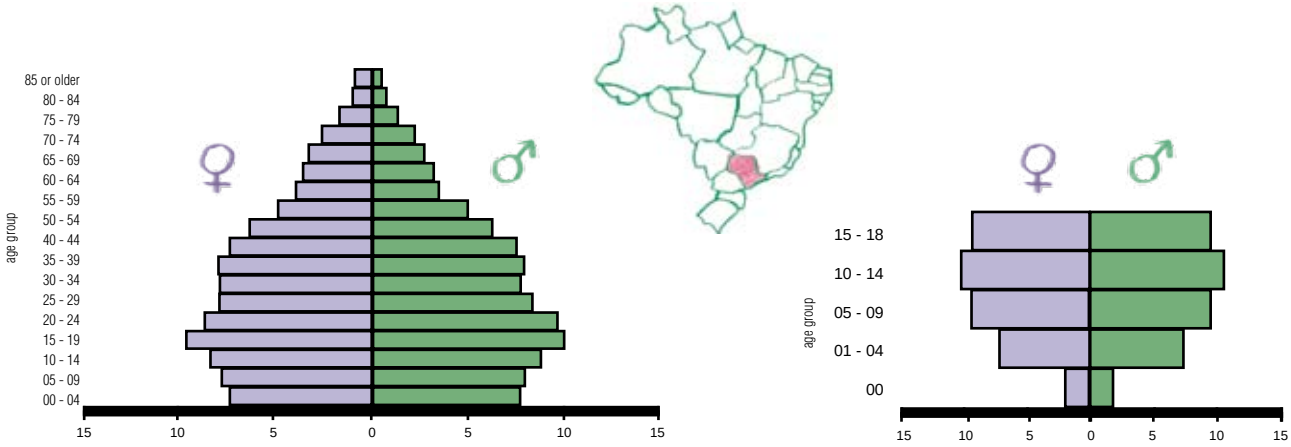

Figure 31. Population Distribution of Jaú

Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Coverage area

The PBCR of Jaú covers the municipality of Jaú, located in Southeastern Region of Brazil and in the central region of São Paulo state, 296 km from the capital. The population is estimated at 124,799 inhabitants (SEADE-2006) and the territorial extension is 687 Km^2. Jaú is located within a 200km radius of many cities that are economic references in their respective regions, such as Campinas, Ribeirão Preto, Araraquara, Bauru, Rio Claro, and São Carlos. The river Tietê runs through the municipality, and the region benefits from an intermodal transportation system that includes railways, highways, and the Tietê-Paraná waterway. Currently known as the "Shoe Capital", Jaú headquarters 220 industries with an annual production of 14 million pairs of shoes. The city also stands out in the following secondary sector industries: heavy machinery, textile, food, precision mechanics, and packaging. Jaú is a regional reference in commercial activity and attends to 10 neighboring cities.

Health care facilities for cancer prevention and control

The municipality is responsible for health programs contained in the Primary Health Care Management-PABA and provides services by means of the Basic Units of Healthcare, Family Healthcare Unit, Municipal Emergency Ward, and Movel Unit Care (SAMU). The following municipal services provide attendance in specialized clinics: therapeutic attendance nucleus (speech therapy, psychology and audiometry), ophthalmology center, women's assistance center, testing and counseling center (DST/AIDS), Home Attendance Program, CAPS (Psychosocial Attendance Center), Family Planning Ambulatory, Minor Surgery Ambulatory, Odontology Center, Physiotherapy, Ambulance Center, and Sterilization Center. Jaú also relies on two general hospitals (Santa Casa de Jaú and São Judas Tadeu Hospital), one psychiatric hospital (Tereza Perlati Hospital), and one specialized hospital in oncology (Amaral Carvalho Hospital).

Infrastructure and Data Source

The activities of the PBCR-Jaú started in August 2006 with a partnership between the City of Jaú and Amaral Carvalho Foundation. New cases diagnosed between January 2000 and December 2004 were collected and the first data were publicized in December 2006 in INCA's website. Data collection actively occurs in 16 notifying sources, the first of which are the Amaral Carvalho Hospital and two anatomical pathology laboratories.

The death certificates reporting cancer are sent to Jau's Department of Epidemiological Surveillance and are also compared to the death databases in São Paulo state, by means of a partnership between the PBCR-Jaú and the state data analysis system (SEADE). The PBCR-Jaú staff currently includes a coordinator, who is a medical advisor, three advisors, and three registrars.

Use of Information

The information generated by the PBCR-Jaú has been used for obtaining a scientific picture of cancer incidence in the municipality and, especially, for planning and organizing the public network of oncology.

PBCR team-Jaú

Coordinator

Dr. José Getulio Martins Segalla

Advisors

Claudia Luciana de Araújo
Donaldo Botelho Veneziano
Rute Maria Martins Capra

Registrars

Andressa Caramano Pires F. Capra
Marcela Miyuki Santana Ishiguro
Rute Elizabete Grossi

Table 33. Population at risk by sex and age-group from 2000 to 2004

Period: 2000 - 2004	Age-group	Male	Female
	< 1	4,437	4,436
	1-4	17,554	16,976
	5-9	22,651	22,550
	10-14	25,121	24,399
	15-18	22,643	22,405
Total	0 to 18	92,406	90,766
Annual Average	0 to 18	18,481	18,153

Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Table 34. Absolute incidence by type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Jaú, 2000 to 2004*

Pediatric Tumors - Groups	Number of cases						Rates per million						
	0	1-4	5-9	10-14	15-18	0-18	0	1-4	5-9	10-14	15-18	Crude	Adjusted*
I.Leukemia	**0**	**5**	**2**	**0**	**1**	**8**	**0.00**	**144.80**	**44.25**	**0.00**	**22.20**	**43.67**	**52.16**
Ia.Lymphoid leukemia	0	5	1	0	1	7	0.00	144.80	22.12	0.00	22.20	38.22	46.37
Ib.Acute myeloid leukemia	0	0	1	0	0	1	0.00	0.00	22.12	0.00	0.00	5.46	5.79
Ic.Chronic myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ie.Unspecified and other specified leukemias	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
II.Lymphomas and reticuloendothelial neoplasms	**0**	**2**	**3**	**1**	**1**	**7**	**0.00**	**57.92**	**66.37**	**20.19**	**22.20**	**38.22**	**40.87**
IIa.Hodgkin lymphomas	0	0	1	0	0	1	0.00	0.00	22.12	0.00	0.00	5.46	5.79
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	0	1	1	1	3	0.00	0.00	22.12	20.19	22.20	16.38	14.73
IIc.Burkitt lymphoma	0	2	1	0	0	3	0.00	57.92	22.12	0.00	0.00	16.38	20.35
IId.Miscellaneous lymphoreticular neoplasms	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIe.Unspecified lymphomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**0**	**1**	**1**	**1**	**1**	**4**	**0.00**	**28.96**	**22.12**	**20.19**	**22.20**	**21.84**	**22.01**
IIIa.Ependymomas and choroid plexus tumor	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIb.Astrocytomas	0	0	0	0	1	1	0.00	0.00	0.00	0.00	22.20	5.46	4.18
IIIc.Intracranial and intraspinal embryonal tumors	0	0	1	1	0	2	0.00	0.00	22.12	20.19	0.00	10.92	10.55
IIId.Other gliomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIe.Other specified intracranial and intraspinal neoplasms	0	1	0	0	0	1	0.00	28.96	0.00	0.00	0.00	5.46	7.28
IIIf.Unspecified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IV.Neuroblastoma and other peripheral nervous cell tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
IVa.Neuroblastoma and ganglioneuroblastoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
V.Retinoblastoma	**0**	**1**	**0**	**0**	**0**	**1**	**0.00**	**28.96**	**0.00**	**0.00**	**0.00**	**5.46**	**7.28**
VI.Renal tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
VIa.Nephroblastoma and other nonepithelial renal tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIc.Unspecified malignant renal tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VII.Hepatic tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
VIIa.Hepatoblastoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIb.Hepatic carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIII.Malignant bone tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
VIIIa.Osteosarcomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIb.Chondrosarcomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIc.Ewing tumor and related sarcomas of bone	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IX.Soft tissue and other extraosseous sarcomas	**0**	**0**	**0**	**1**	**1**	**2**	**0.00**	**0.00**	**0.00**	**20.19**	**22.20**	**10.92**	**8.94**
IXa.Rhabdomyosarcomas	0	0	0	1	0	1	0.00	0.00	0.00	20.19	0.00	5.46	4.76
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXe.Unspecified soft tissue sarcomas	0	0	0	0	1	1	0.00	0.00	0.00	0.00	22.20	5.46	4.18
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**0**	**1**	**0**	**1**	**0**	**2**	**0.00**	**28.96**	**0.00**	**20.19**	**0.00**	**10.92**	**12.04**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	0	1	0	0	0	1	0.00	28.96	0.00	0.00	0.00	5.46	7.28
Xc.Malignant gonadal germ cell tumors	0	0	0	1	0	1	0.00	0.00	0.00	20.19	0.00	5.46	4.76
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xe.Other and unspecified malignant gonadal tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XI.Other malignant epithelial neoplasms & malignant melanomas	**0**	**0**	**0**	**1**	**2**	**3**	**0.00**	**0.00**	**0.00**	**20.19**	**44.40**	**16.38**	**13.13**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIb.Thyroid carcinomas	0	0	0	0	2	2	0.00	0.00	0.00	0.00	44.40	10.92	8.37
XIc.Nasopharyngeal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XId.Malignant melanomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIe.Skin carcinomas	0	0	0	1	0	1	0.00	0.00	0.00	20.19	0.00	5.46	4.76
XIf.Other and unspecified carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XII.Other and unspecified malignant neoplasms	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIIb.Other and unspecified malignant tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All Neoplasms	**0**	**10**	**6**	**5**	**6**	**27**	**0.00**	**289.60**	**132.74**	**100.97**	**133.19**	**147.40**	**156.42**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

Table 35. Absolute incidence by sex and type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Jaú, 2000 to 2004*

Pediatric Tumors - Groups	Male								Female							
	Number of cases						Rates per million		Number of cases						Rates per million	
	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*
I.Leukemia	**0**	**2**	**1**	**0**	**1**	**4**	**43.29**	**48.51**	**0**	**3**	**1**	**0**	**0**	**4**	**44.07**	**56.02**
Ia.Lymphoid leukemia	0	2	0	0	1	3	32.47	36.96	0	3	1	0	0	4	44.07	56.02
Ib.Acute myeloid leukemia	0	0	1	0	0	1	10.82	11.56	0	0	0	0	0	0	0.00	0.00
Ic.Chronic myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Ie.Unspecified and other specified leukemias	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
II.Lymphomas and reticuloendothelial neoplasms	**0**	**2**	**2**	**1**	**1**	**6**	**64.93**	**69.45**	**0**	**0**	**1**	**0**	**0**	**1**	**11.02**	**11.61**
IIa.Hodgkin lymphomas	0	0	0	0	0	0	0.00	0.00	0	0	1	0	0	1	11.02	11.61
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	0	1	1	1	3	32.47	29.26	0	0	0	0	0	0	0.00	0.00
IIc.Burkitt lymphoma	0	2	1	0	0	3	32.47	40.19	0	0	0	0	0	0	0.00	0.00
IId.Miscellaneous lymphoreticular neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIe.Unspecified lymphomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**0**	**0**	**1**	**0**	**0**	**1**	**10.82**	**11.56**	**0**	**1**	**0**	**1**	**1**	**3**	**33.05**	**32.87**
IIIa.Ependymomas and choroid plexus tumor	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIb.Astrocytomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	1	1	11.02	8.41
IIIc.Intracranial and intraspinal embryonal tumors	0	0	1	0	0	1	10.82	11.56	0	0	0	1	0	1	11.02	9.66
IIId.Other gliomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0	1	0	0	0	1	11.02	14.80
IIIf.Unspecified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IV.Neuroblastoma and other peripheral nervous cell tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
IVa.Neuroblastoma and ganglioneuroblastoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
V.Retinoblastoma	**0**	**1**	**0**	**0**	**0**	**1**	**10.82**	**14.32**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
VI.Renal tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
VIa.Nephroblastoma and other nonepithelial renal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIc.Unspecified malignant renal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VII.Hepatic tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
VIIa.Hepatoblastoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIb.Hepatic carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIII.Tumores osseos malignos	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
VIIIa.Osteosarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIb.Chondrosarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIc.Ewing tumor and related sarcomas of bone	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IX.Soft tissue and other extraosseous sarcomas	**0**	**0**	**0**	**1**	**0**	**1**	**10.82**	**9.38**	**0**	**0**	**0**	**0**	**1**	**1**	**11.02**	**8.41**
IXa.Rhabdomyosarcomas	0	0	0	1	0	1	10.82	9.38	0	0	0	0	0	0	0.00	0.00
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXe.Unspecified soft tissue sarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	1	1	11.02	8.41
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**1**	**0**	**1**	**0**	**2**	**22.03**	**24.46**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	1	0	0	0	1	11.02	14.80
Xc.Malignant gonadal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	1	0	1	11.02	9.66
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xe.Other and unspecified malignant gonadal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XI.Other malignant epithelial neoplasms & malignant melanomas	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**1**	**2**	**3**	**33.05**	**26.48**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIb.Thyroid carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	2	2	22.03	16.82
XIc.Nasopharyngeal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XId.Malignant melanomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIe.Skin carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	1	0	1	11.02	9.66
XIf.Other and unspecified carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XII.Other and unspecified malignant neoplasms	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIIb.Other and unspecified malignant tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
All Neoplasms	**0**	**5**	**4**	**2**	**2**	**13**	**140.68**	**153.22**	**0**	**5**	**2**	**3**	**4**	**14**	**140.69**	**153.22**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

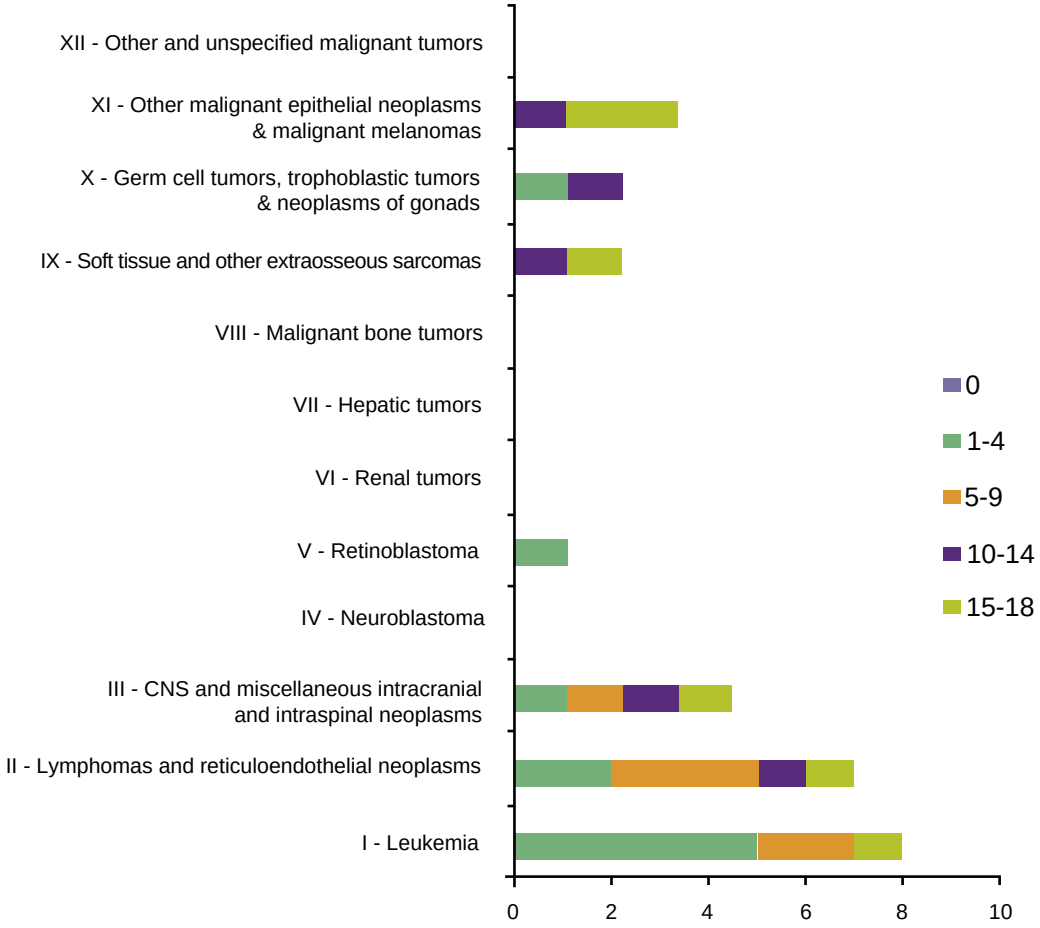

Figure 32. Number of cases by type of childhood cancer, by age-group, Jaú, 2000 a 2004

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

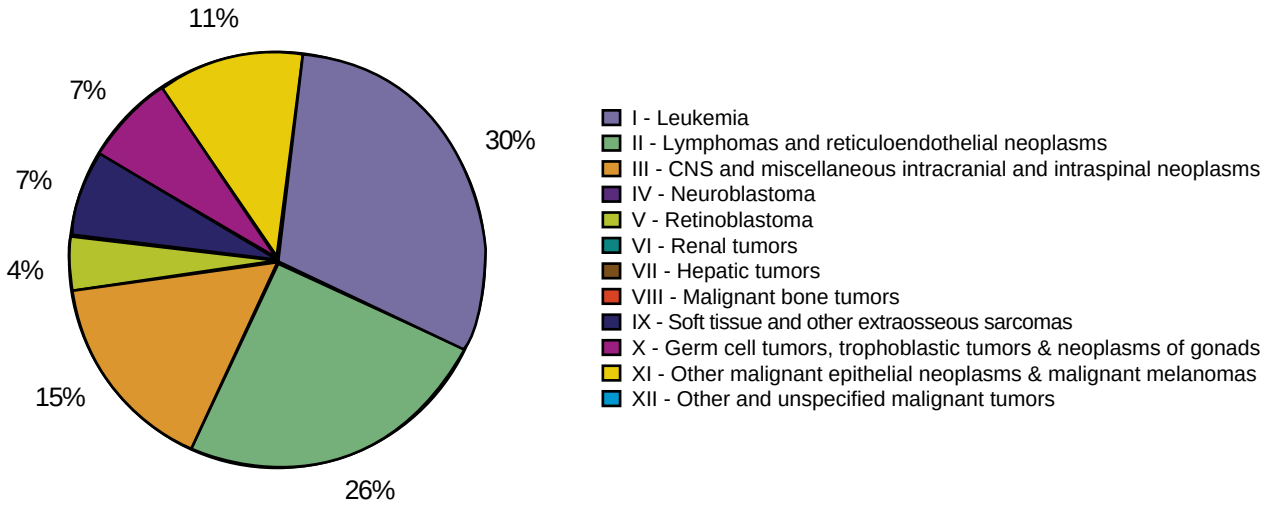

Figure 33. Percentage distribution of incidence by type of childhood cancer, Jaú, 2000 to 2004

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

PBCR of João Pessoa/PB

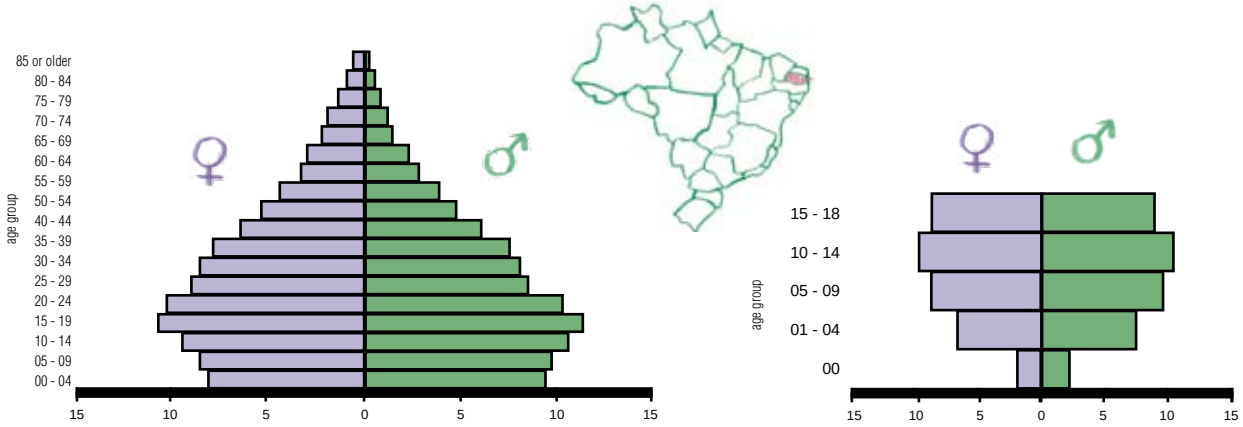

Figure 34. Population Distribution of João Pessoa

*Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Coverage area

The PBCR of João Pessoa covers the city of João Pessoa, located in the Northeastern Region of Brazil. The extension area of João Pessoa is 211 Km². About 70% of the population lives in urban areas (approximately 674,762 inhabitants), with an annual growth rate of 2.32%. The city lies 40m above sea level and the climate is hot and humid, with an average annual temperature of 26.6ºC.

Health care facilities for cancer prevention and control

Health programs and services are offered by two public hospitals and one private hospital. There are also 180 teams of the Family Health Program (Programa de Saúde na Família - PSF) with cancer prevention and early detection programs. Other units for diagnosis and treatment of cancer include two radiotherapy services, three chemotherapy services and 19 anatomical pathology laboratories. There are also six universities and two of them offer medical programs.

Infrastructure and data source

The PBCR was created in 2000. It is located in the Department of Health of the State of Paraíba. The PBCR depends on fixed financial support. The registry's staff counts on three collectors – a coordinator, a medical doctor, and a supervisor/ Registar. The advisory board is composed of one epidemiologist, one statistician and one oncologist.

Data collection actively occurs in 66 notifying sources: one specialized hospital, one university hospital, 16 general hospitals, 35 anatomical pathology laboratories, three hematology services, four oncology clinics, two radiotherapy services, three chemotherapy services. The death certificates are obtained from the Mortality Information System – SIM.

Use of Information

In addition to determining the cancer incidence and geographic distribution in João Pessoa, the information has been used in the study of temporal trends, access to tracking programs, data supply of epidemiological studies, and for administering classes and lectures.

PBCR team – João Pessoa

Coordinator
Josefa Ângela Pontes de Aquino

Registrars/Collectors
Helemário José Pacheco de França Filho
Vanja Raquel Vasconcelos de Lemos
Osmaldo Barbosa de Miranda

Technical Support
Luis Rodrigo Gomes Brandão

Typists
Vanja Raquel Vasconcelos de Lemos
Helemário José Pacheco de França Filho
Luis Otávio Duarte Henrique
Osmaldo Barbosa de Miranda

Table 36. Population at risk by sex and age-group from 2000 to 2004

Period: 2000 - 2004	Age-group	Male	Female
	< 1	27,205	26,428
	1-4	109,701	105,755
	5-9	141,639	138,298
	10-14	153,504	152,906
	15-18	130,721	138,523
Total	0 to 18	562,770	561,910
Annual Average	0 to 18	112,554	112,382

Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Table 37. Absolute incidence by type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of João Pessoa, 2000 to 2004*

Pediatric Tumors - Groups	Number of cases						Rates per million						
	0	1-4	5-9	10-14	15-18	0-18	0	1-4	5-9	10-14	15-18	Crude	Adjusted*
I.Leukemia	**0**	**12**	**10**	**5**	**11**	**38**	**0.00**	**55.70**	**35.72**	**16.32**	**40.86**	**33.79**	**34.89**
Ia.Lymphoid leukemia	0	8	6	4	7	25	0.00	37.13	21.43	13.05	26.00	22.23	22.92
Ib.Acute myeloid leukemia	0	2	3	1	4	10	0.00	9.28	10.72	3.26	14.86	8.89	8.71
Ic.Chronic myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	1	1	0	0	2	0.00	4.64	3.57	0.00	0.00	1.78	2.10
Ie.Unspecified and other specified leukemias	0	1	0	0	0	1	0.00	4.64	0.00	0.00	0.00	0.89	1.17
II.Lymphomas and reticuloendothelial neoplasms	**1**	**6**	**5**	**4**	**8**	**24**	**18.65**	**27.85**	**17.86**	**13.05**	**29.71**	**21.34**	**21.52**
IIa.Hodgkin lymphomas	0	1	1	4	5	11	0.00	4.64	3.57	13.05	18.57	9.78	8.68
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	1	4	2	0	3	10	18.65	18.57	7.14	0.00	11.14	8.89	9.81
IIc.Burkitt lymphoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IId.Miscellaneous lymphoreticular neoplasms	0	1	2	0	0	3	0.00	4.64	7.14	0.00	0.00	2.67	3.04
IIe.Unspecified lymphomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**1**	**6**	**5**	**2**	**3**	**17**	**18.65**	**27.85**	**17.86**	**6.53**	**11.14**	**15.12**	**16.48**
IIIa.Ependymomas and choroid plexus tumor	1	0	0	0	0	1	18.65	0.00	0.00	0.00	0.00	0.89	1.17
IIIb.Astrocytomas	0	4	1	0	2	7	0.00	18.57	3.57	0.00	7.43	6.22	7.00
IIIc.Intracranial and intraspinal embryonal tumors	0	2	1	1	0	4	0.00	9.28	3.57	3.26	0.00	3.56	4.04
IIId.Other gliomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	0	0	3	1	1	5	0.00	0.00	10.72	3.26	3.71	4.45	4.27
IV.Neuroblastoma and other peripheral nervous cell tumors	**0**	**1**	**1**	**1**	**0**	**3**	**0.00**	**4.64**	**3.57**	**3.26**	**0.00**	**2.67**	**2.87**
IVa.Neuroblastoma and ganglioneuroblastoma	0	1	1	0	0	2	0.00	4.64	3.57	0.00	0.00	1.78	2.10
IVb.Other peripheral nervous cell tumors	0	0	0	1	0	1	0.00	0.00	0.00	3.26	0.00	0.89	0.77
V.Retinoblastoma	**0**	**3**	**0**	**0**	**0**	**3**	**0.00**	**13.92**	**0.00**	**0.00**	**0.00**	**2.67**	**3.50**
VI.Renal tumors	**1**	**6**	**2**	**0**	**0**	**9**	**18.65**	**27.85**	**7.14**	**0.00**	**0.00**	**8.00**	**10.04**
VIa.Nephroblastoma and other nonepithelial renal tumors	1	6	2	0	0	9	18.65	27.85	7.14	0.00	0.00	8.00	10.04
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIc.Unspecified malignant renal tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VII.Hepatic tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
VIIa.Hepatoblastoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIb.Hepatic carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIII.Malignant bone tumors	**1**	**0**	**1**	**6**	**8**	**16**	**18.65**	**0.00**	**3.57**	**19.58**	**29.71**	**14.23**	**12.32**
VIIIa.Osteosarcomas	0	0	0	4	3	7	0.00	0.00	0.00	13.05	11.14	6.22	5.18
VIIIb.Chondrosarcomas	0	0	0	0	1	1	0.00	0.00	0.00	0.00	3.71	0.89	0.70
VIIIc.Ewing tumor and related sarcomas of bone	0	0	0	2	2	4	0.00	0.00	0.00	6.53	7.43	3.56	2.94
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIe.Unspecified malignant bone tumors	1	0	1	0	2	4	18.65	0.00	3.57	0.00	7.43	3.56	3.51
IX.Soft tissue and other extraosseous sarcomas	**0**	**4**	**1**	**2**	**3**	**10**	**0.00**	**18.57**	**3.57**	**6.53**	**11.14**	**8.89**	**9.24**
IXa.Rhabdomyosarcomas	0	4	1	2	0	7	0.00	18.57	3.57	6.53	0.00	6.22	7.14
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	0	0	0	1	1	0.00	0.00	0.00	0.00	3.71	0.89	0.70
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXe.Unspecified soft tissue sarcomas	0	0	0	0	2	2	0.00	0.00	0.00	0.00	7.43	1.78	1.40
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**0**	**0**	**0**	**2**	**2**	**4**	**0.00**	**0.00**	**0.00**	**6.53**	**7.43**	**3.56**	**2.94**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xc.Malignant gonadal germ cell tumors	0	0	0	2	1	3	0.00	0.00	0.00	6.53	3.71	2.67	2.24
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xe.Other and unspecified malignant gonadal tumors	0	0	0	0	1	1	0.00	0.00	0.00	0.00	3.71	0.89	0.70
XI.Other malignant epithelial neoplasms & malignant melanomas	**0**	**4**	**1**	**5**	**8**	**18**	**0.00**	**18.57**	**3.57**	**16.32**	**29.71**	**16.00**	**15.05**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIb.Thyroid carcinomas	0	0	0	1	2	3	0.00	0.00	0.00	3.26	7.43	2.67	2.17
XIc.Nasopharyngeal carcinomas	0	0	0	1	0	1	0.00	0.00	0.00	3.26	0.00	0.89	0.77
XId.Malignant melanomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIe.Skin carcinomas	0	0	0	2	1	3	0.00	0.00	0.00	6.53	3.71	2.67	2.24
XIf.Other and unspecified carcinomas	0	4	1	1	5	11	0.00	18.57	3.57	3.26	18.57	9.78	9.87
XII.Other and unspecified malignant neoplasms	**1**	**4**	**0**	**0**	**2**	**7**	**18.65**	**18.57**	**0.00**	**0.00**	**7.43**	**6.22**	**7.24**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIIb.Other and unspecified malignant tumors	1	4	0	0	2	7	18.65	18.57	0.00	0.00	7.43	6.22	7.24
All Neoplasms	**5**	**46**	**26**	**27**	**45**	**149**	**93.23**	**213.50**	**92.88**	**88.12**	**167.13**	**132.48**	**136.09**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

Table 38. Absolute incidence by sex and type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of João Pessoa, 2000 to 2004*

Pediatric Tumors - Groups	Male								Female							
	Number of cases						Rates per million		Number of cases						Rates per million	
	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*
I.Leukemia	**0**	**6**	**6**	**3**	**8**	**23**	**40.87**	**40.97**	**0**	**6**	**4**	**2**	**3**	**15**	**26.69**	**28.99**
Ia.Lymphoid leukemia	0	5	4	2	4	15	26.65	27.68	0	3	2	2	3	10	17.80	18.08
Ib.Acute myeloid leukemia	0	0	1	1	4	6	10.66	9.15	0	2	2	0	0	4	7.12	8.54
Ic.Chronic myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	1	0	0	1	1.78	1.85	0	1	0	0	0	1	1.78	2.38
Ie.Unspecified and other specified leukemias	0	1	0	0	0	1	1.78	2.29	0	0	0	0	0	0	0.00	0.00
II.Lymphomas and reticuloendothelial neoplasms	**0**	**5**	**4**	**3**	**4**	**16**	**28.43**	**29.22**	**1**	**1**	**1**	**1**	**4**	**8**	**14.24**	**13.63**
IIa.Hodgkin lymphomas	0	0	1	3	2	6	10.66	9.34	0	1	0	1	3	5	8.90	8.00
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	4	1	0	2	7	12.44	13.90	1	0	1	0	1	3	5.34	5.63
IIc.Burkitt lymphoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IId.Miscellaneous lymphoreticular neoplasms	0	1	2	0	0	3	5.33	5.99	0	0	0	0	0	0	0.00	0.00
IIe.Unspecified lymphomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**1**	**4**	**2**	**0**	**1**	**8**	**14.22**	**16.61**	**0**	**2**	**3**	**2**	**2**	**9**	**16.02**	**16.23**
IIIa.Ependymomas and choroid plexus tumor	1	0	0	0	0	1	1.78	2.31	0	0	0	0	0	0	0.00	0.00
IIIb.Astrocytomas	0	3	1	0	0	4	7.11	8.72	0	1	0	0	2	3	5.34	5.10
IIIc.Intracranial and intraspinal embryonal tumors	0	1	1	0	0	2	3.55	4.14	0	1	0	1	0	2	3.56	3.92
IIId.Other gliomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	0	0	0	0	1	1	1.78	1.44	0	0	3	1	0	4	7.12	7.22
IV.Neuroblastoma and other peripheral nervous cell tumors	**0**	**1**	**1**	**1**	**0**	**3**	**5.33**	**5.67**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
IVa.Neuroblastoma and ganglioneuroblastoma	0	1	1	0	0	2	3.55	4.14	0	0	0	0	0	0	0.00	0.00
IVb.Other peripheral nervous cell tumors	0	0	0	1	0	1	1.78	1.53	0	0	0	0	0	0	0.00	0.00
V.Retinoblastoma	**0**	**2**	**0**	**0**	**0**	**2**	**3.55**	**4.58**	**0**	**1**	**0**	**0**	**0**	**1**	**1.78**	**2.38**
VI.Renal tumors	**0**	**2**	**1**	**0**	**0**	**3**	**5.33**	**6.43**	**1**	**4**	**1**	**0**	**0**	**6**	**10.68**	**13.78**
VIa.Nephroblastoma and other nonepithelial renal tumors	0	2	1	0	0	3	5.33	6.43	1	4	1	0	0	6	10.68	13.78
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIc.Unspecified malignant renal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VII.Hepatic tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
VIIa.Hepatoblastoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIb.Hepatic carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIII.Malignant bone tumors	**1**	**0**	**1**	**4**	**6**	**12**	**21.32**	**18.95**	**0**	**0**	**0**	**2**	**2**	**4**	**7.12**	**5.80**
VIIIa.Osteosarcomas	0	0	0	3	2	5	8.88	7.49	0	0	0	1	1	2	3.56	2.90
VIIIb.Chondrosarcomas	0	0	0	0	1	1	1.78	1.44	0	0	0	0	0	0	0.00	0.00
VIIIc.Ewing tumor and related sarcomas of bone	0	0	0	1	1	2	3.55	2.98	0	0	0	1	1	2	3.56	2.90
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIe.Unspecified malignant bone tumors	1	0	1	0	2	4	7.11	7.04	0	0	0	0	0	0	0.00	0.00
IX.Soft tissue and other extraosseous sarcomas	**0**	**4**	**0**	**2**	**2**	**8**	**14.22**	**15.12**	**0**	**0**	**1**	**0**	**1**	**2**	**3.56**	**3.25**
IXa.Rhabdomyosarcomas	0	4	0	2	0	6	10.66	12.23	0	0	1	0	0	1	1.78	1.89
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	0	0	0	1	1	1.78	1.44	0	0	0	0	0	0	0.00	0.00
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXe.Unspecified soft tissue sarcomas	0	0	0	0	1	1	1.78	1.44	0	0	0	0	1	1	1.78	1.36
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**0**	**0**	**0**	**0**	**2**	**2**	**3.55**	**2.88**	**0**	**0**	**0**	**2**	**0**	**2**	**3.56**	**3.08**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xc.Malignant gonadal germ cell tumors	0	0	0	0	1	1	1.78	1.44	0	0	0	2	0	2	3.56	3.08
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xe.Other and unspecified malignant gonadal tumors	0	0	0	0	1	1	1.78	1.44	0	0	0	0	0	0	0.00	0.00
XI.Other malignant epithelial neoplasms & malignant melanomas	**0**	**2**	**1**	**1**	**5**	**9**	**15.99**	**15.17**	**0**	**2**	**0**	**4**	**3**	**9**	**16.02**	**15.00**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIb.Thyroid carcinomas	0	0	0	0	2	2	3.55	2.88	0	0	0	1	0	1	1.78	1.54
XIc.Nasopharyngeal carcinomas	0	0	0	1	0	1	1.78	1.53	0	0	0	0	0	0	0.00	0.00
XId.Malignant melanomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIe.Skin carcinomas	0	0	0	0	1	1	1.78	1.44	0	0	0	2	0	2	3.56	3.08
XIf.Other and unspecified carcinomas	0	2	1	0	2	5	8.88	9.31	0	2	0	1	3	6	10.68	10.38
XII.Other and unspecified malignant neoplasms	**1**	**2**	**0**	**0**	**1**	**4**	**7.11**	**8.33**	**0**	**2**	**0**	**0**	**1**	**3**	**5.34**	**6.11**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIIb.Other and unspecified malignant tumors	1	2	0	0	1	4	7.11	8.33	0	2	0	0	1	3	5.34	6.11
All Neoplasms	**3**	**28**	**16**	**14**	**29**	**90**	**159.92**	**163.95**	**2**	**18**	**10**	**13**	**16**	**59**	**105.00**	**108.26**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

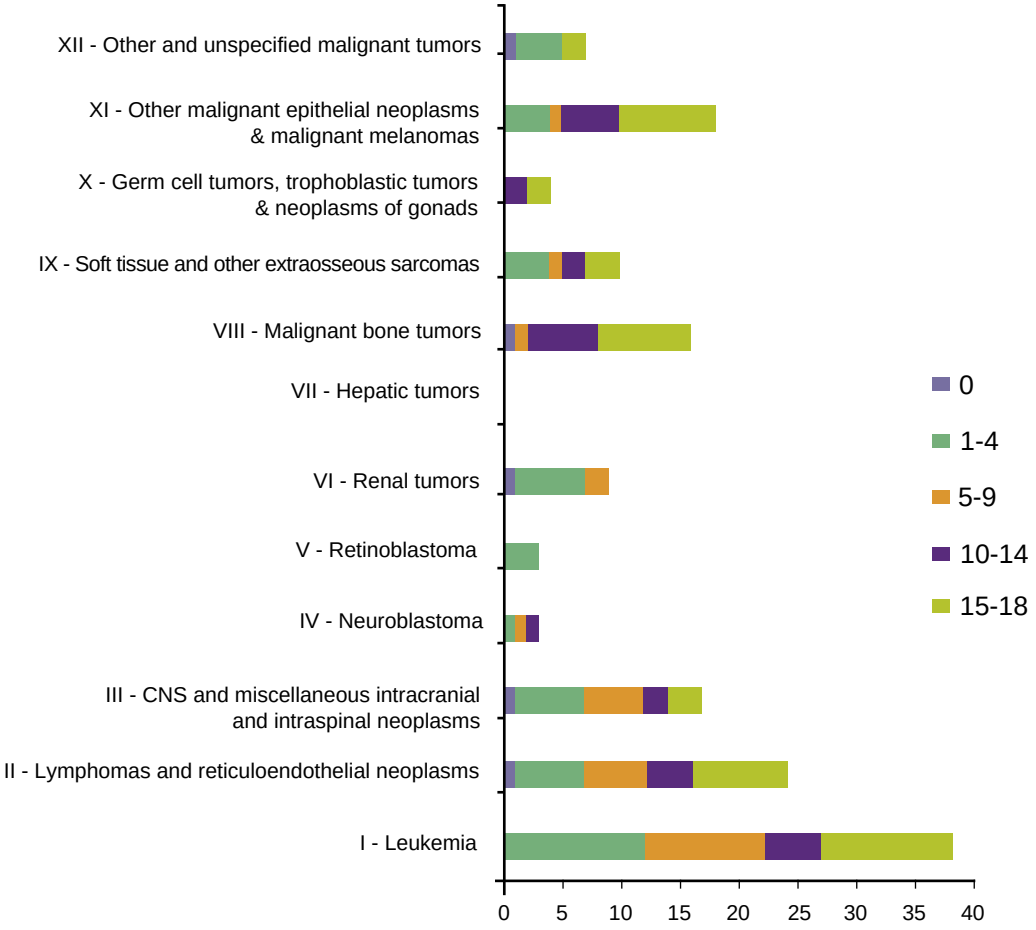

Figure 35. Number of cases by type of childhood cancer, by age-group, João Pessoa, 2000 to 2004

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

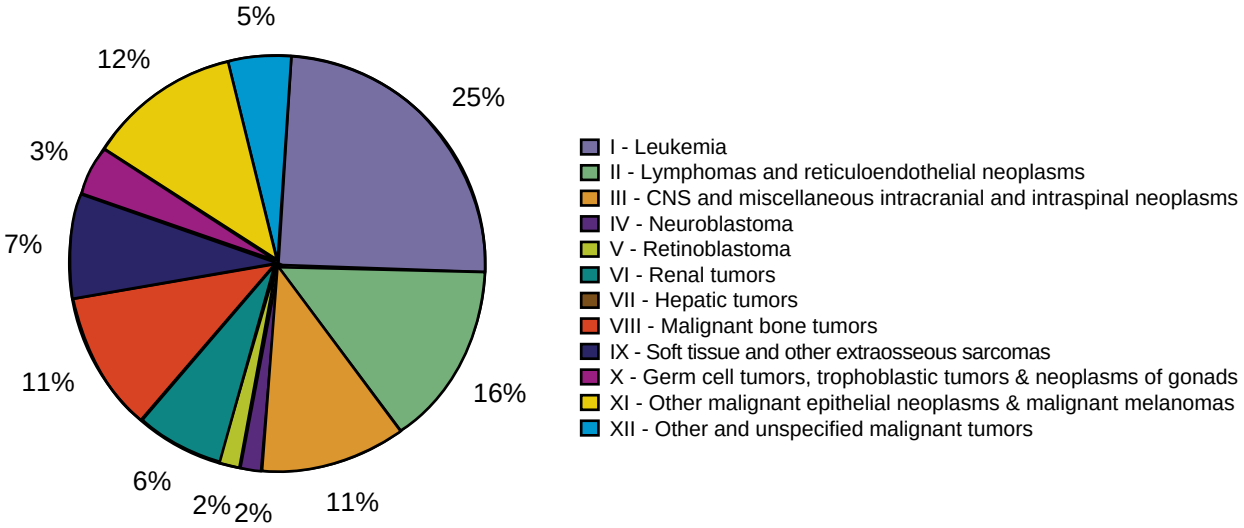

Figure 36. Percentage distribution of incidence by type of childhood cancer, male and female, João Pessoa, 2000 to 2004

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

PBCR of Manaus/AM

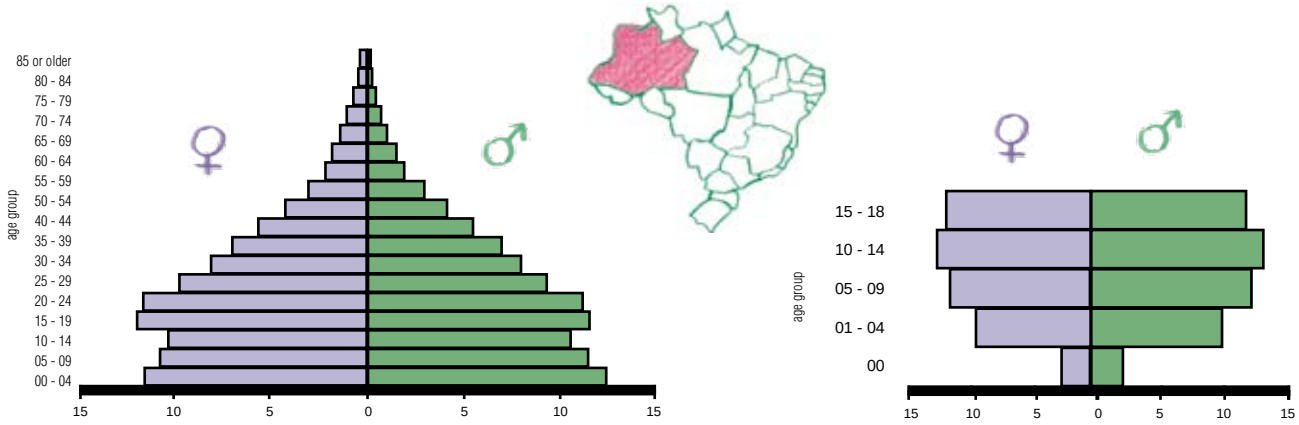

Figure 37. Population Distribution of Manaus

*Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Coverage area

The PBCR of Manaus covers the municipality of Manaus, located in the Northern Region of Brazil. Manaus extends 11,408Km^2. Approximately 94.41% of the population lives in urban areas (around 1,636,837 inhabitants). Manaus is 25m above sea level and the climate is humid equatorial, with an average annual temperature of 26.7ºC.

Health care facilities for cancer prevention and control

The health programs and services are offered by 38 hospitals (both public and private) and the total number of available hospital beds is 4,153 (2.52 per 1000 inhabitants). There are 75 health units implementing programs of cancer prevention and early detection. Other units for cancer diagnosis and treatment include two radiotherapy services, three chemotherapy services, and 13 anatomical pathology laboratories. There are also 18 universities, three of which offer medical programs.

Infrastructure and data source

The PBCR was created in 2001 and data started being collected in 1999. It is located in the Amazonas Control Center for Oncology and depends on fixed financial support. The staff of the registry includes one coordinator/statistician, four registrars, and one computer technician. The advisory board is composed of one statistician, two oncology nurses, and one oncologist.

Data collection actively occurs in 14 notifying sources: one specialized hospital, one university hospital, three general hospitals, three anatomical pathology laboratories, one hematology service, one radiotherapy service, and three chemotherapy services. The death certificates are taken from the Mortality Information System – SIM.

Use of Information

In addition to determining the incidence and geographical distribution of cancer in Manaus, the information has been used to study temporal trends, to access to tracking programs, for data supply for epidemiological studies, and for administering classes and lectures.

PBCR team –Manaus

Coordinator
Anasselis Veiga de Lima

Registrars
Elisacarla Neves Cardoso
Nayara Cabral Machado
Paulo Ewerton Silva de Araújo
Piririma Sarmento Vanziler

Advisory board
Anasselis Veiga de Lima
Marília Muniz Cavalcante de Oliveira
Manoel Jesus Pinheiro Coelho
Maria José Moreira Pinheiro

Table 39. Population at risk by sex and age-group from 1999 to 2002

Period: 1999 - 2002	Age-group	Male	Female
	< 1	68,978	66,480
	1-4	267,349	261,615
	5-9	310,302	304,506
	10-14	297,399	304,142
	15-18	255,127	276,320
Total	0 to 18	1,199,155	1,213,063
Annual Average	0 to 18	299,789	303,266

Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Table 40. Absolute incidence by type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Manaus, 1999 to 2002*

Pediatric Tumors - Groups	Number of cases						Rates per million						
	0	1-4	5-9	10-14	15-18	0-18	0	1-4	5-9	10-14	15-18	Crude	Adjusted*
I.Leukemia	**7**	**61**	**45**	**28**	**17**	**158**	**51.68**	**115.32**	**73.19**	**46.55**	**31.99**	**65.50**	**68.38**
Ia.Lymphoid leukemia	5	50	31	17	10	113	36.91	94.52	50.42	28.26	18.82	46.84	49.48
Ib.Acute myeloid leukemia	0	5	6	7	1	19	0.00	9.45	9.76	11.64	1.88	7.88	8.03
Ic.Chronic myeloproliferative diseases	0	0	1	1	5	7	0.00	0.00	1.63	1.66	9.41	2.90	2.59
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	1	0	0	1	0.00	0.00	1.63	0.00	0.00	0.41	0.43
Ie.Unspecified and other specified leukemias	2	6	6	3	1	18	14.76	11.34	9.76	4.99	1.88	7.46	7.86
II.Lymphomas and reticuloendothelial neoplasms	**1**	**12**	**17**	**16**	**10**	**56**	**7.38**	**22.69**	**27.65**	**26.60**	**18.82**	**23.22**	**23.22**
IIa.Hodgkin lymphomas	0	2	8	10	3	23	0.00	3.78	13.01	16.62	5.64	9.53	9.34
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	0	5	4	5	14	0.00	0.00	8.13	6.65	9.41	5.80	5.47
IIc.Burkitt lymphoma	0	3	2	1	1	7	0.00	5.67	3.25	1.66	1.88	2.90	3.02
IId.Miscellaneous lymphoreticular neoplasms	1	4	2	0	0	7	7.38	7.56	3.25	0.00	0.00	2.90	3.22
IIe.Unspecified lymphomas	0	3	0	1	1	5	0.00	5.67	0.00	1.66	1.88	2.07	2.17
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**2**	**6**	**20**	**7**	**11**	**46**	**14.76**	**11.34**	**32.53**	**11.64**	**20.70**	**19.07**	**18.94**
IIIa.Ependymomas and choroid plexus tumor	0	1	1	1	0	3	0.00	1.89	1.63	1.66	0.00	1.24	1.29
IIIb.Astrocytomas	0	3	5	2	5	15	0.00	5.67	8.13	3.32	9.41	6.22	6.11
IIIc.Intracranial and intraspinal embryonal tumors	0	0	4	0	3	7	0.00	0.00	6.51	0.00	5.64	2.90	2.77
IIId.Other gliomas	0	0	0	1	0	1	0.00	0.00	0.00	1.66	0.00	0.41	0.39
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	2	2	10	3	3	20	14.76	3.78	16.27	4.99	5.64	8.29	8.37
IV.Neuroblastoma and other peripheral nervous cell tumors	**1**	**3**	**0**	**0**	**0**	**4**	**7.38**	**5.67**	**0.00**	**0.00**	**0.00**	**1.66**	**1.89**
IVa.Neuroblastoma and ganglioneuroblastoma	1	3	0	0	0	4	7.38	5.67	0.00	0.00	0.00	1.66	1.89
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
V.Retinoblastoma	**1**	**9**	**0**	**0**	**0**	**10**	**7.38**	**17.01**	**0.00**	**0.00**	**0.00**	**4.15**	**4.74**
VI.Renal tumors	**0**	**9**	**2**	**0**	**0**	**11**	**0.00**	**17.01**	**3.25**	**0.00**	**0.00**	**4.56**	**5.13**
VIa.Nephroblastoma and other nonepithelial renal tumors	0	9	2	0	0	11	0.00	17.01	3.25	0.00	0.00	4.56	5.13
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIc.Unspecified malignant renal tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VII.Hepatic tumors	**0**	**1**	**1**	**1**	**1**	**4**	**0.00**	**1.89**	**1.63**	**1.66**	**1.88**	**1.66**	**1.65**
VIIa.Hepatoblastoma	0	1	1	1	0	3	0.00	1.89	1.63	1.66	0.00	1.24	1.29
VIIb.Hepatic carcinomas	0	0	0	0	1	1	0.00	0.00	0.00	0.00	1.88	0.41	0.35
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIII.Malignant bone tumors	**0**	**0**	**4**	**10**	**12**	**26**	**0.00**	**0.00**	**6.51**	**16.62**	**22.58**	**10.78**	**9.88**
VIIIa.Osteosarcomas	0	0	3	8	8	19	0.00	0.00	4.88	13.30	15.05	7.88	7.25
VIIIb.Chondrosarcomas	0	0	0	0	1	1	0.00	0.00	0.00	0.00	1.88	0.41	0.35
VIIIc.Ewing tumor and related sarcomas of bone	0	0	1	1	2	4	0.00	0.00	1.63	1.66	3.76	1.66	1.53
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	0	0	1	1	2	0.00	0.00	0.00	1.66	1.88	0.83	0.75
IX.Soft tissue and other extraosseous sarcomas	**1**	**2**	**3**	**0**	**2**	**8**	**7.38**	**3.78**	**4.88**	**0.00**	**3.76**	**3.32**	**3.40**
IXa.Rhabdomyosarcomas	0	1	2	0	2	5	0.00	1.89	3.25	0.00	3.76	2.07	2.04
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	1	1	0	0	0	2	7.38	1.89	0.00	0.00	0.00	0.83	0.94
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	0	1	0	0	1	0.00	0.00	1.63	0.00	0.00	0.41	0.43
IXe.Unspecified soft tissue sarcomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**0**	**0**	**0**	**3**	**7**	**10**	**0.00**	**0.00**	**0.00**	**4.99**	**13.17**	**4.15**	**3.66**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	0	0	0	0	1	1	0.00	0.00	0.00	0.00	1.88	0.41	0.35
Xc.Malignant gonadal germ cell tumors	0	0	0	3	5	8	0.00	0.00	0.00	4.99	9.41	3.32	2.95
Xd.Gonadal carcinomas	0	0	0	0	1	1	0.00	0.00	0.00	0.00	1.88	0.41	0.35
Xe.Other and unspecified malignant gonadal tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XI.Other malignant epithelial neoplasms & malignant melanomas	**0**	**1**	**2**	**3**	**11**	**17**	**0.00**	**1.89**	**3.25**	**4.99**	**20.70**	**7.05**	**6.40**
XIa.Adrenocortical carcinomas	0	0	0	1	0	1	0.00	0.00	0.00	1.66	0.00	0.41	0.39
XIb.Thyroid carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIc.Nasopharyngeal carcinomas	0	0	0	0	1	1	0.00	0.00	0.00	0.00	1.88	0.41	0.35
XId.Malignant melanomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIe.Skin carcinomas	0	1	1	0	0	2	0.00	1.89	1.63	0.00	0.00	0.83	0.90
XIf.Other and unspecified carcinomas	0	0	1	2	10	13	0.00	0.00	1.63	3.32	18.82	5.39	4.76
XII.Other and unspecified malignant neoplasms	**4**	**7**	**4**	**3**	**4**	**22**	**29.53**	**13.23**	**6.51**	**4.99**	**7.53**	**9.12**	**9.48**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIIb.Other and unspecified malignant tumors	4	7	4	3	4	22	29.53	13.23	6.51	4.99	7.53	9.12	9.48
All Neoplasms	**17**	**111**	**98**	**71**	**75**	**372**	**125.50**	**209.84**	**159.40**	**118.03**	**141.12**	**154.21**	**156.76**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

Table 41. Absolute incidence by sex and type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Manaus, 1999 to 2002*

Pediatric Tumors - Groups	Male								Female							
	Number of cases						Rates per million		Number of cases						Rates per million	
	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*
I.Leukemia	**7**	**32**	**24**	**15**	**12**	**90**	**75.05**	**77.45**	**0**	**29**	**21**	**13**	**5**	**68**	**56.06**	**59.39**
Ia.Lymphoid leukemia	5	25	17	8	6	61	50.87	53.17	0	25	14	9	4	52	42.87	45.75
Ib.Acute myeloid leukemia	0	4	3	6	1	14	11.67	11.78	0	1	3	1	0	5	4.12	4.31
Ic.Chronic myeloproliferative diseases	0	0	0	1	5	6	5.00	4.49	0	0	1	0	0	1	0.82	0.86
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0	0	1	0	0	1	0.82	0.86
Ie.Unspecified and other specified leukemias	2	3	4	0	0	9	7.51	8.02	0	3	2	3	1	9	7.42	7.61
II.Lymphomas and reticuloendothelial neoplasms	**1**	**9**	**8**	**9**	**9**	**36**	**30.02**	**29.90**	**0**	**2**	**9**	**7**	**1**	**19**	**15.66**	**15.76**
IIa.Hodgkin lymphomas	0	2	3	5	3	13	10.84	10.59	0	0	5	5	0	10	8.24	8.17
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	0	4	3	5	12	10.01	9.45	0	0	1	1	0	2	1.65	1.63
IIc.Burkitt lymphoma	0	2	1	0	0	3	2.50	2.72	0	1	1	1	1	4	3.30	3.28
IId.Miscellaneous lymphoreticular neoplasms	1	2	0	0	0	3	2.50	2.79	0	1	2	0	0	3	2.47	2.68
IIe.Unspecified lymphomas	0	3	0	1	1	5	4.17	4.35	0	0	0	0	0	0	0.00	0.00
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**2**	**4**	**13**	**5**	**6**	**30**	**25.02**	**24.94**	**0**	**2**	**7**	**2**	**5**	**16**	**13.19**	**12.90**
IIIa.Ependymomas and choroid plexus tumor	0	1	1	0	0	2	1.67	1.78	0	0	0	1	0	1	0.82	0.77
IIIb.Astrocytomas	0	1	2	2	2	7	5.84	5.69	0	2	3	0	3	8	6.59	6.55
IIIc.Intracranial and intraspinal embryonal tumors	0	0	3	0	2	5	4.17	4.01	0	0	1	0	1	2	1.65	1.54
IIId.Other gliomas	0	0	0	1	0	1	0.83	0.79	0	0	0	0	0	0	0.00	0.00
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	2	2	7	2	2	15	12.51	12.67	0	0	3	1	1	5	4.12	4.04
IV.Neuroblastoma and other peripheral nervous cell tumors	**1**	**1**	**0**	**0**	**0**	**2**	**1.67**	**1.85**	**0**	**2**	**0**	**0**	**0**	**2**	**1.65**	**1.92**
IVa.Neuroblastoma and ganglioneuroblastoma	1	1	0	0	0	2	1.67	1.85	0	2	0	0	0	2	1.65	1.92
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
V.Retinoblastoma	**0**	**7**	**0**	**0**	**0**	**7**	**5.84**	**6.58**	**1**	**2**	**0**	**0**	**0**	**3**	**2.47**	**2.87**
VI.Renal tumors	**0**	**6**	**0**	**0**	**0**	**6**	**5.00**	**5.64**	**0**	**3**	**2**	**0**	**0**	**5**	**4.12**	**4.60**
VIa.Nephroblastoma and other nonepithelial renal tumors	0	6	0	0	0	6	5.00	5.64	0	3	2	0	0	5	4.12	4.60
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIc.Unspecified malignant renal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VII.Hepatic tumors	**0**	**1**	**0**	**1**	**1**	**3**	**2.50**	**2.47**	**0**	**0**	**1**	**0**	**0**	**1**	**0.82**	**0.86**
VIIa.Hepatoblastoma	0	1	0	1	0	2	1.67	1.73	0	0	1	0	0	1	0.82	0.86
VIIb.Hepatic carcinomas	0	0	0	0	1	1	0.83	0.74	0	0	0	0	0	0	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIII.Malignant bone tumors	**0**	**0**	**1**	**4**	**10**	**15**	**12.51**	**11.40**	**0**	**0**	**3**	**6**	**2**	**11**	**9.07**	**8.59**
VIIIa.Osteosarcomas	0	0	0	2	8	10	8.34	7.49	0	0	3	6	0	9	7.42	7.23
VIIIb.Chondrosarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	1	1	0.82	0.68
VIIIc.Ewing tumor and related sarcomas of bone	0	0	1	1	2	4	3.34	3.11	0	0	0	0	0	0	0.00	0.00
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	0	0	1	0	1	0.83	0.79	0	0	0	0	1	1	0.82	0.68
IX.Soft tissue and other extraosseous sarcomas	**1**	**2**	**1**	**0**	**1**	**5**	**4.17**	**4.37**	**0**	**0**	**2**	**0**	**1**	**3**	**2.47**	**2.40**
IXa.Rhabdomyosarcomas	0	1	1	0	1	3	2.50	2.52	0	0	1	0	1	2	1.65	1.54
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	1	1	0	0	0	2	1.67	1.85	0	0	0	0	0	0	0.00	0.00
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	0	0	0	0	0	0.00	0.00	0	0	1	0	0	1	0.82	0.86
IXe.Unspecified soft tissue sarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**0**	**0**	**0**	**0**	**2**	**2**	**1.67**	**1.48**	**0**	**0**	**0**	**3**	**5**	**8**	**6.59**	**5.73**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	1	1	0.82	0.68
Xc.Malignant gonadal germ cell tumors	0	0	0	0	2	2	1.67	1.48	0	0	0	3	3	6	4.95	4.37
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	1	1	0.82	0.68
Xe.Other and unspecified malignant gonadal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XI.Other malignant epithelial neoplasms & malignant melanomas	**0**	**1**	**1**	**1**	**2**	**5**	**4.17**	**4.05**	**0**	**0**	**1**	**2**	**9**	**12**	**9.89**	**8.55**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	1	0	1	0.82	0.77
XIb.Thyroid carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIc.Nasopharyngeal carcinomas	0	0	0	0	1	1	0.83	0.74	0	0	0	0	0	0	0.00	0.00
XId.Malignant melanomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIe.Skin carcinomas	0	1	0	0	0	1	0.83	0.94	0	0	1	0	0	1	0.82	0.86
XIf.Other and unspecified carcinomas	0	0	1	1	1	3	2.50	2.37	0	0	0	1	9	10	8.24	6.91
XII.Other and unspecified malignant neoplasms	**3**	**3**	**2**	**1**	**1**	**10**	**8.34**	**8.77**	**1**	**4**	**2**	**2**	**3**	**12**	**9.89**	**10.10**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIIb.Other and unspecified malignant tumors	3	3	2	1	1	10	8.34	8.77	1	4	2	2	3	12	9.89	10.10
All Neoplasms	**15**	**66**	**50**	**36**	**44**	**211**	**175.96**	**178.91**	**2**	**44**	**48**	**35**	**31**	**160**	**131.90**	**133.68**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

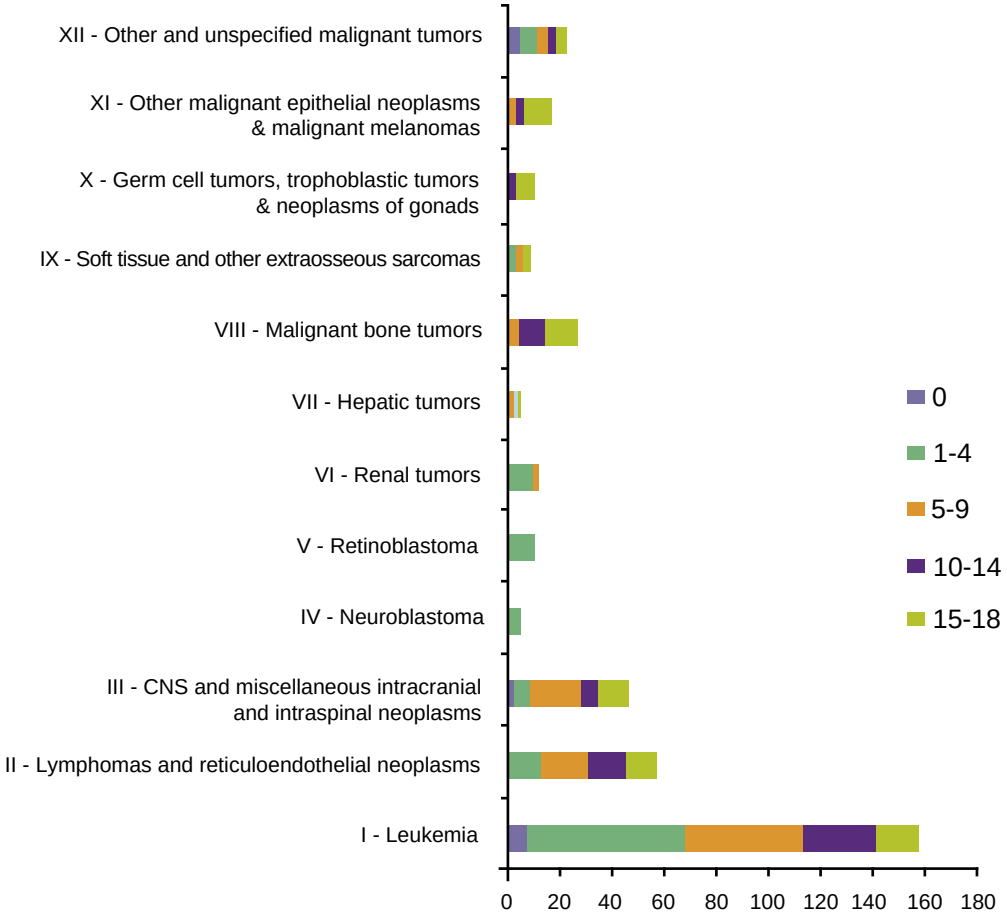

Figure 38. Number of cases by type of childhood cancer, by age-group, Manaus, 1999 to 2002

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

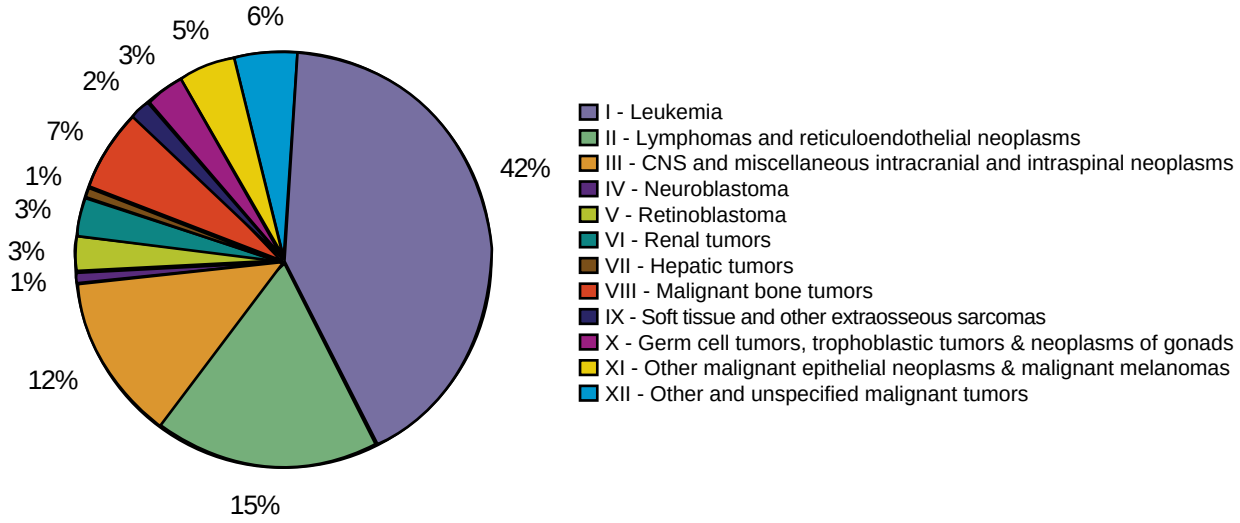

Figure 39. Percentage distribution of incidence by type of childhood cancer, Manaus, 1999 to 2002

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

PBCR of Natal/RN

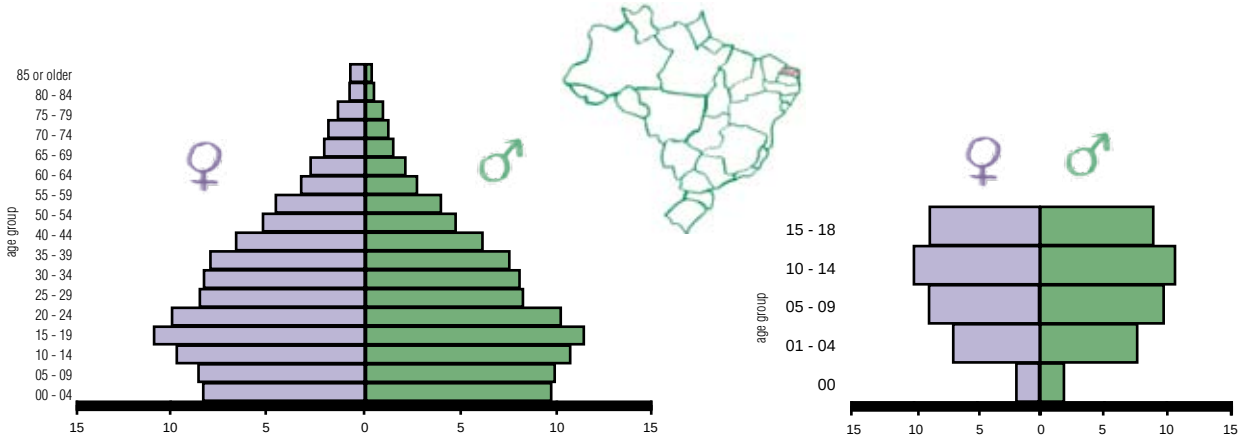

Figure 40. Population Distribution of Natal

*Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Coverage area

The PBCR of Natal covers the municipality of Natal, located in the Northeastern Region of Brazil. Natal extends 169.1 km² and has a population of 801,665 inhabitants. The annual growth rate of this state capital is 1.49%, 2.18% in the metropolitan region and 3.87% in the surrounding municipalities. Natal lies 30m above sea level and the climate is humid, with an average temperature of 27ºC.

Health care facilities for cancer prevention and control

Health programs and services are offered through 35 hospitals (18 specialized hospitals and 17 general hospitals): 12 public hospitals, 19 private hospitals, 2 university hospitals, and 2 philanthropic hospitals, with 8,113 hospital beds (2.63 hospital beds per 1000 inhabitants). The capital of Rio Grande do Norte, Natal, has a population of 801,665 inhabitants and furnishes 3,068 hospital beds (3.83 hospital beds per 1000 inhabitants). The state covers 76.50% of the Family Health Strategy, in a total of 829 teams working in the program for cancer prevention, distributed across 771 health units.

Infrastructure and data source

Although cancer-related data collection in Rio Grande do Norte initiated in 1993, the Population-Based Cancer Registry – PBCR/Natal was only implemented in 1996. The registry staff currently includes one coordinator, two registrars, one typist and one epidemiologist. Data is actively collected in 31 notifying sources: five specialized hospitals, six general hospitals (two university hospitals - Hospital Onofre Lopes and Maternidade Escola Januário Cicco), seven anatomical pathology laboratories, two hematology services, one oncology clinic, one radiotherapy service, and one chemotherapy service. The death certificates are obtained from the Mortality Information System-SIM and the Death Verification Service (Serviço de Verificação de Óbito-SVO).

Use of Information

The information from the cancer registries are primary sources used in epidemiological research for determining cancer factors, planning and assessing health services, and cancer prevention, diagnosis and treatment. This data is used to analyze and interpret data about cancer, information about incidence, specific cancer characteristics, and temporal variations in incidence.

PBCR team - Natal

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Celeste Maria Rocha Melo

Coordinator of PBCR - Natal
José Alexandre Menezes da Silva

Epidemiologist
Severina Pereira de Oliveira

Registrars
Gisonildo Pereira
Maria Margarida Pereira Leite

Typist
Gleyse Karina de Medeiros Costa

Computer Support
Josiel Mariano Cordeiro

Table 42. Population at risk by sex and age-group from 1998 to 2001

Period: 1998 - 2001	Age-group	Male	Female
	< 1	26,414	25,173
	1-4	105,077	101,782
	5-9	135,016	132,640
	10-14	146,300	149,210
	15-18	119,032	129,426
Total	0 to 18	531,839	538,231
Annual Average	0 to 18	132,960	134,558

Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Table 43. Absolute incidence by type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Natal, 1998 to 2001*

Pediatric Tumors - Groups	Number of cases						Rates per million						
	0	1-4	5-9	10-14	15-18	0-18	0	1-4	5-9	10-14	15-18	Crude	Adjusted*
I.Leukemia	**1**	**20**	**7**	**16**	**4**	**48**	**19.38**	**96.68**	**26.15**	**54.14**	**16.10**	**44.86**	**48.15**
Ia.Lymphoid leukemia	0	14	5	9	4	32	0.00	67.68	18.68	30.46	16.10	29.90	32.11
Ib.Acute myeloid leukemia	1	4	1	4	0	10	19.38	19.34	3.74	13.54	0.00	9.35	10.24
Ic.Chronic myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	1	0	0	0	1	0.00	4.83	0.00	0.00	0.00	0.93	1.21
Ie.Unspecified and other specified leukemias	0	1	1	3	0	5	0.00	4.83	3.74	10.15	0.00	4.67	4.58
II.Lymphomas and reticuloendothelial neoplasms	**2**	**8**	**9**	**6**	**5**	**30**	**38.77**	**38.67**	**33.63**	**20.30**	**20.12**	**28.04**	**29.53**
IIa.Hodgkin lymphomas	0	2	1	2	3	8	0.00	9.67	3.74	6.77	12.07	7.48	7.28
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	1	3	3	1	8	0.00	4.83	11.21	10.15	4.02	7.48	7.30
IIc.Burkitt lymphoma	0	2	2	0	0	4	0.00	9.67	7.47	0.00	0.00	3.74	4.39
IId.Miscellaneous lymphoreticular neoplasms	1	1	0	0	0	2	19.38	4.83	0.00	0.00	0.00	1.87	2.43
IIe.Unspecified lymphomas	1	2	3	1	1	8	19.38	9.67	11.21	3.38	4.02	7.48	8.14
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**0**	**1**	**1**	**7**	**2**	**11**	**0.00**	**4.83**	**3.74**	**23.69**	**8.05**	**10.28**	**9.29**
IIIa.Ependymomas and choroid plexus tumor	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIb.Astrocytomas	0	0	0	2	0	2	0.00	0.00	0.00	6.77	0.00	1.87	1.59
IIIc.Intracranial and intraspinal embryonal tumors	0	0	1	3	0	4	0.00	0.00	3.74	10.15	0.00	3.74	3.37
IIId.Other gliomas	0	1	0	1	1	3	0.00	4.83	0.00	3.38	4.02	2.80	2.77
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	0	0	0	1	1	2	0.00	0.00	0.00	3.38	4.02	1.87	1.56
IV.Neuroblastoma and other peripheral nervous cell tumors	**0**	**0**	**3**	**1**	**1**	**5**	**0.00**	**0.00**	**11.21**	**3.38**	**4.02**	**4.67**	**4.49**
IVa.Neuroblastoma and ganglioneuroblastoma	0	0	3	1	0	4	0.00	0.00	11.21	3.38	0.00	3.74	3.73
IVb.Other peripheral nervous cell tumors	0	0	0	0	1	1	0.00	0.00	0.00	0.00	4.02	0.93	0.76
V.Retinoblastoma	**2**	**5**	**1**	**1**	**0**	**9**	**38.77**	**24.17**	**3.74**	**3.38**	**0.00**	**8.41**	**10.29**
VI.Renal tumors	**1**	**1**	**1**	**1**	**0**	**4**	**19.38**	**4.83**	**3.74**	**3.38**	**0.00**	**3.74**	**4.21**
VIa.Nephroblastoma and other nonepithelial renal tumors	1	1	1	1	0	4	19.38	4.83	3.74	3.38	0.00	3.74	4.21
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIc.Unspecified malignant renal tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VII.Hepatic tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
VIIa.Hepatoblastoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIb.Hepatic carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIII.Malignant bone tumors	**0**	**0**	**1**	**4**	**3**	**8**	**0.00**	**0.00**	**3.74**	**13.54**	**12.07**	**7.48**	**6.44**
VIIIa.Osteosarcomas	0	0	0	3	3	6	0.00	0.00	0.00	10.15	12.07	5.61	4.67
VIIIb.Chondrosarcomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIc.Ewing tumor and related sarcomas of bone	0	0	0	1	0	1	0.00	0.00	0.00	3.38	0.00	0.93	0.80
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	0	1	0	0	1	0.00	0.00	3.74	0.00	0.00	0.93	0.98
IX.Soft tissue and other extraosseous sarcomas	**0**	**0**	**2**	**0**	**2**	**4**	**0.00**	**0.00**	**7.47**	**0.00**	**8.05**	**3.74**	**3.47**
IXa.Rhabdomyosarcomas	0	0	0	0	2	2	0.00	0.00	0.00	0.00	8.05	1.87	1.52
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	0	1	0	0	1	0.00	0.00	3.74	0.00	0.00	0.93	0.98
IXe.Unspecified soft tissue sarcomas	0	0	1	0	0	1	0.00	0.00	3.74	0.00	0.00	0.93	0.98
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**0**	**1**	**0**	**3**	**0**	**4**	**0.00**	**4.83**	**0.00**	**10.15**	**0.00**	**3.74**	**3.61**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xc.Malignant gonadal germ cell tumors	0	0	0	2	0	2	0.00	0.00	0.00	6.77	0.00	1.87	1.59
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xe.Other and unspecified malignant gonadal tumors	0	1	0	1	0	2	0.00	4.83	0.00	3.38	0.00	1.87	2.01
XI.Other malignant epithelial neoplasms & malignant melanomas	**0**	**2**	**2**	**2**	**12**	**18**	**0.00**	**9.67**	**7.47**	**6.77**	**48.30**	**16.82**	**15.08**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIb.Thyroid carcinomas	0	0	1	1	4	6	0.00	0.00	3.74	3.38	16.10	5.61	4.81
XIc.Nasopharyngeal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XId.Malignant melanomas	0	0	1	0	4	5	0.00	0.00	3.74	0.00	16.10	4.67	4.01
XIe.Skin carcinomas	0	0	0	0	1	1	0.00	0.00	0.00	0.00	4.02	0.93	0.76
XIf.Other and unspecified carcinomas	0	2	0	1	3	6	0.00	9.67	0.00	3.38	12.07	5.61	5.50
XII.Other and unspecified malignant neoplasms	**0**	**2**	**1**	**3**	**5**	**11**	**0.00**	**9.67**	**3.74**	**10.15**	**20.12**	**10.28**	**9.59**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIIb.Other and unspecified malignant tumors	0	2	1	3	5	11	0.00	9.67	3.74	10.15	20.12	10.28	9.59
All Neoplasms	**6**	**40**	**28**	**44**	**34**	**152**	**116.31**	**193.37**	**104.61**	**148.90**	**136.84**	**142.05**	**144.16**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

Table 44. Absolute incidence by sex and type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Natal, 1998 to 2001*

Pediatric Tumors - Groups	Male								Female							
	Number of cases						Rates per million		Number of cases						Rates per million	
	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*
I.Leukemia	**0**	**13**	**3**	**12**	**3**	**31**	**58.29**	**60.98**	**1**	**7**	**4**	**4**	**1**	**17**	**31.58**	**35.45**
Ia.Lymphoid leukemia	0	8	3	7	3	21	39.49	40.97	0	6	2	2	1	11	20.44	23.38
Ib.Acute myeloid leukemia	0	3	0	2	0	5	9.40	10.40	1	1	1	2	0	5	9.29	10.10
Ic.Chronic myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	1	0	0	0	1	1.88	2.39	0	0	0	0	0	0	0.00	0.00
Ie.Unspecified and other specified leukemias	0	1	0	3	0	4	7.52	7.22	0	0	1	0	0	1	1.86	1.97
II.Lymphomas and reticuloendothelial neoplasms	**0**	**4**	**6**	**3**	**0**	**13**	**24.44**	**26.03**	**2**	**4**	**3**	**3**	**5**	**17**	**31.58**	**32.81**
IIa.Hodgkin lymphomas	0	2	1	1	0	4	7.52	8.33	0	0	0	1	3	4	7.43	5.95
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	1	1	2	0	4	7.52	7.55	0	0	2	1	1	4	7.43	6.98
IIc.Burkitt lymphoma	0	1	2	0	0	3	5.64	6.27	0	1	0	0	0	1	1.86	2.47
IId.Miscellaneous lymphoreticular neoplasms	0	0	0	0	0	0	0.00	0.00	1	1	0	0	0	2	3.72	4.96
IIe.Unspecified lymphomas	0	0	2	0	0	2	3.76	3.88	1	2	1	1	1	6	11.15	12.44
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**0**	**0**	**0**	**6**	**0**	**6**	**11.28**	**9.66**	**0**	**1**	**1**	**1**	**2**	**5**	**9.29**	**8.93**
IIIa.Ependymomas and choroid plexus tumor	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIb.Astrocytomas	0	0	0	2	0	2	3.76	3.22	0	0	1	0	0	1	1.86	1.97
IIIc.Intracranial and intraspinal embryonal tumors	0	0	0	3	0	3	5.64	4.83	0	1	0	0	1	2	3.72	3.93
IIId.Other gliomas	0	0	0	1	0	1	1.88	1.61	0	0	0	0	0	0	0.00	0.00
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	0	1	1	2	3.72	3.04
IV.Neuroblastoma and other peripheral nervous cell tumors	**0**	**0**	**2**	**0**	**1**	**3**	**5.64**	**5.46**	**0**	**0**	**1**	**1**	**0**	**2**	**3.72**	**3.55**
IVa.Neuroblastoma and ganglioneuroblastoma	0	0	2	0	0	2	3.76	3.88	0	0	1	1	0	2	3.72	3.55
IVb.Other peripheral nervous cell tumors	0	0	0	0	1	1	1.88	1.58	0	0	0	0	0	0	0.00	0.00
V.Retinoblastoma	**2**	**3**	**1**	**1**	**0**	**7**	**13.16**	**15.48**	**0**	**2**	**0**	**0**	**0**	**2**	**3.72**	**4.94**
VI.Renal tumors	**1**	**1**	**0**	**1**	**0**	**3**	**5.64**	**6.38**	**0**	**0**	**1**	**0**	**0**	**1**	**1.86**	**1.97**
VIa.Nephroblastoma and other nonepithelial renal tumors	1	1	0	1	0	3	5.64	6.38	0	0	1	0	0	1	1.86	1.97
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIc.Unspecified malignant renal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VII.Hepatic tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
VIIa.Hepatoblastoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIb.Hepatic carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIII.Malignant bone tumors	**0**	**0**	**0**	**1**	**1**	**2**	**3.76**	**3.19**	**0**	**0**	**1**	**3**	**2**	**6**	**11.15**	**9.62**
VIIIa.Osteosarcomas	0	0	0	0	1	1	1.88	1.58	0	0	0	3	2	5	9.29	7.65
VIIIb.Chondrosarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIc.Ewing tumor and related sarcomas of bone	0	0	0	1	0	1	1.88	1.61	0	0	0	0	0	0	0.00	0.00
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0	0	1	0	0	1	1.86	1.97
IX.Soft tissue and other extraosseous sarcomas	**0**	**0**	**0**	**0**	**1**	**1**	**1.88**	**1.58**	**0**	**0**	**2**	**0**	**1**	**3**	**5.57**	**5.40**
IXa.Rhabdomyosarcomas	0	0	0	0	1	1	1.88	1.58	0	0	0	0	1	1	1.86	1.46
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	0	0	0	0	0	0.00	0.00	0	0	1	0	0	1	1.86	1.97
IXe.Unspecified soft tissue sarcomas	0	0	0	0	0	0	0.00	0.00	0	0	1	0	0	1	1.86	1.97
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**0**	**1**	**0**	**1**	**0**	**2**	**3.76**	**4.00**	**0**	**0**	**0**	**2**	**0**	**2**	**3.72**	**3.16**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xc.Malignant gonadal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	2	0	2	3.72	3.16
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xe.Other and unspecified malignant gonadal tumors	0	1	0	1	0	2	3.76	4.00	0	0	0	0	0	0	0.00	0.00
XI.Other malignant epithelial neoplasms & malignant melanomas	**0**	**1**	**0**	**1**	**3**	**5**	**9.40**	**8.75**	**0**	**1**	**2**	**1**	**9**	**13**	**24.15**	**21.10**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIb.Thyroid carcinomas	0	0	0	0	1	1	1.88	1.58	0	0	1	1	3	5	9.29	7.92
XIc.Nasopharyngeal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XId.Malignant melanomas	0	0	0	0	2	2	3.76	3.17	0	0	1	0	2	3	5.57	4.89
XIe.Skin carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	1	1	1.86	1.46
XIf.Other and unspecified carcinomas	0	1	0	1	0	2	3.76	4.00	0	1	0	0	3	4	7.43	6.84
XII.Other and unspecified malignant neoplasms	**0**	**1**	**0**	**1**	**3**	**5**	**9.40**	**8.75**	**0**	**1**	**1**	**2**	**2**	**6**	**11.15**	**10.51**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIIb.Other and unspecified malignant tumors	0	1	0	1	3	5	9.40	8.75	0	1	1	2	2	6	11.15	10.51
All Neoplasms	**3**	**24**	**12**	**27**	**12**	**78**	**146.66**	**150.28**	**3**	**16**	**16**	**17**	**22**	**74**	**137.49**	**137.45**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

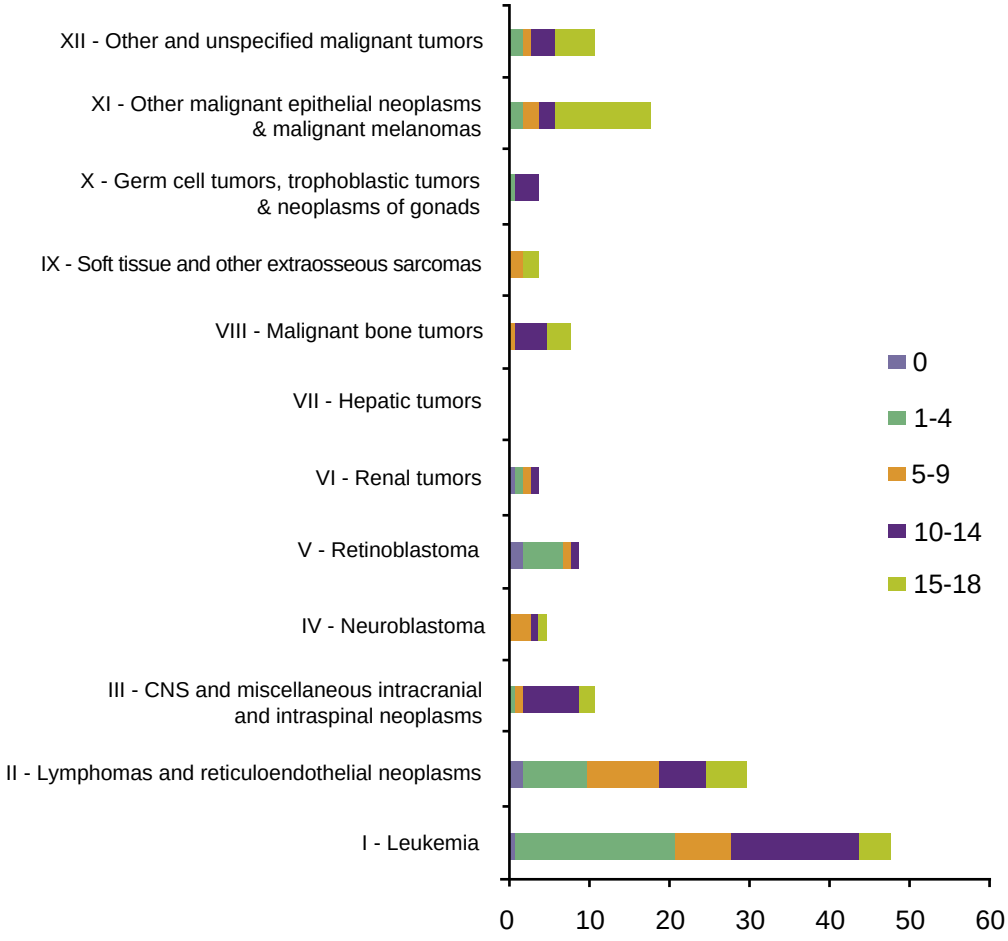

Figure 41. Number of cases by type of childhood cancer, by age-group, Natal, 1998 to 2001

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

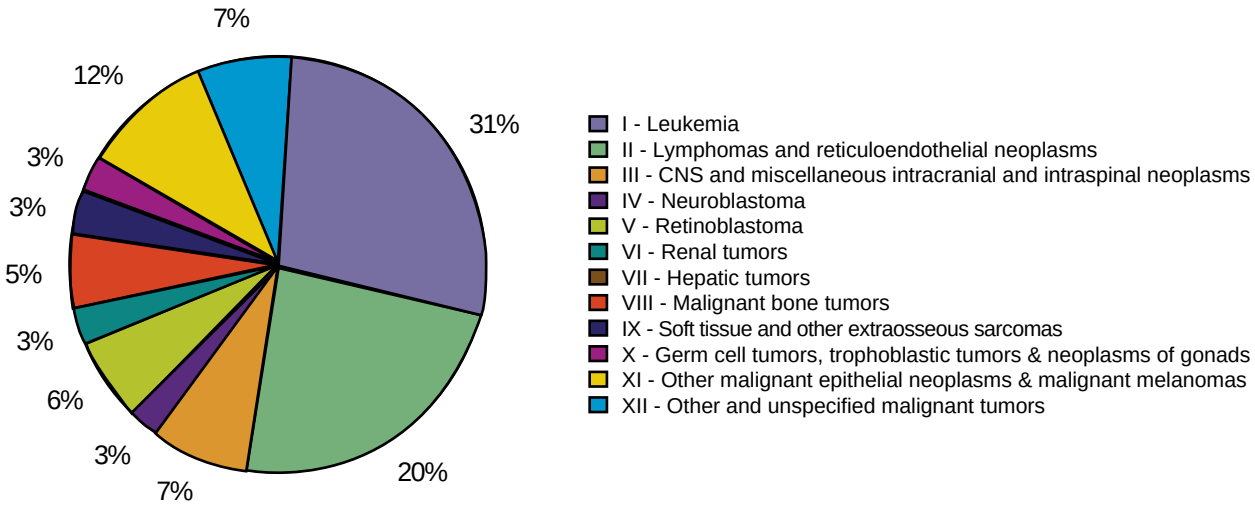

Figure 42. Percentage distribution of incidence by type of childhood cancer, Natal, 1998 to 2001

Source: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística (IBGE)
MS/INCA/Conprev/Divisão de Informação

PBCR of Palmas/TO

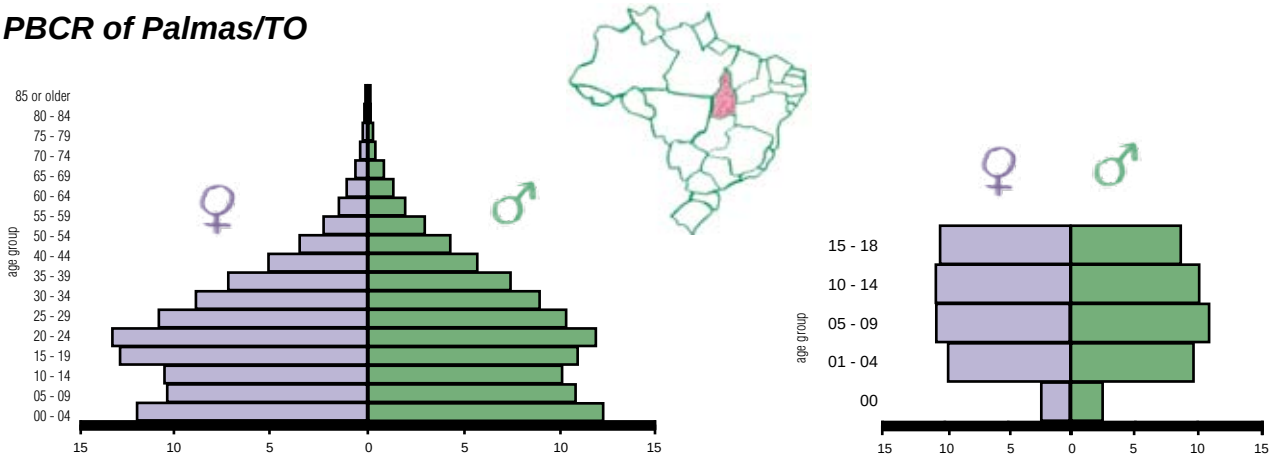

Figure 43. Population Distribution of Palmas

*Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Coverage area

The PBCR of Palmas covers the municipality of Palmas (capital of the state of Tocantins, which has an area of 277,620.914 Km^2), located in the Northern Region of Brazil and extends 2,219 Km^2. Approximately 99% of the population lives in urban areas, with an annual growth rate of 29.31%. The city of Palmas presents an average altitude of 700m and has a tropical climate, with an average annual temperature of 28ºC.

Health care facilities for cancer prevention and control

Health services and programs are offered by 100 health establishments, 72 of which are federally supported by the SUS. There are 276 hospital beds, 181 of which are located in public health institutions. Other units for diagnosis and treatment of cancer in the state include two UNACON (Palmas and Araguaína) and four anatomical pathology laboratories. There are also health units with cancer prevention and early detection programs, such as anti-tobacco actions (Tabagismo nos Ambientes Livres do Cigarro), health education in schools (Saber Saúde nas Escolas), specific anti-tobacco campaigns (May 31 and August 29), and the National Cancer Combat Day (November 25), through the distribution of educational material. Additionally, specific actions towards uterine cancer control occur daily though educational lectures and Pap Smear exams. For the treatment of uterine lesions, there are five secondary units across the state, which are references in colposcopy.

Infrastructure and data source

In search of enhanced information about cancer incidence in Brazil, the Tocantins State Department of Health implemented and developed the Population-Based Cancer Registry (PBCR) in Palmas, located in the Northern Region of Brazil. It was created by decree: Portaria 394 of May 03, 2000, and data collection started in 2001. Data collection actively occurs in 13 notifying sources: five hospitals, one hematology center, six laboratories, and through the SIM and SISCOLO.

Use of Information

In addition to determining the incidence and geographical distribution of cancer in Palmas, the information has been used to study temporal trends, for access to tracking programs, data supply for epidemiological studies, classes, lectures, and publications.

PBCR team – Palmas

Coordinator
Viviane Lilia de Araújo Ribeiro

Registrars/Collector
Alicia Chagas Mitt
Tiago da Costa Reis

Typist
Emanuela Giorni

Table 45. Population at risk by sex and age-group from 2000 to 2003

Period: 2000 - 2003	Age-group	Male	Female
	< 1	7,576	7,285
	1-4	30,382	29,577
	5-9	33,508	32,089
	10-14	31,429	32,632
	15-18	26,864	31,606
Total	0 to 18	129,759	133,189
Annual Average	0 to 18	32,440	33,297

Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Table 46. Absolute incidence by type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Palmas, 2000 to 2003*

Pediatric Tumors - Groups	Number of cases						Rates per million						
	0	1-4	5-9	10-14	15-18	0-18	0	1-4	5-9	10-14	15-18	Crude	Adjusted*
I.Leukemia	**0**	**0**	**1**	**1**	**0**	**2**	**0.00**	**0.00**	**15.24**	**15.61**	**0.00**	**7.61**	**7.67**
Ia.Lymphoid leukemia	0	0	1	1	0	2	0.00	0.00	15.24	15.61	0.00	7.61	7.67
Ib.Acute myeloid leukemia	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ic.Chronic myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ie.Unspecified and other specified leukemias	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
II.Lymphomas and reticuloendothelial neoplasms	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
IIa.Hodgkin lymphomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIc.Burkitt lymphoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IId.Miscellaneous lymphoreticular neoplasms	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIe.Unspecified lymphomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**0**	**1**	**0**	**1**	**0**	**2**	**0.00**	**16.68**	**0.00**	**15.61**	**0.00**	**7.61**	**7.87**
IIIa.Ependymomas and choroid plexus tumor	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIb.Astrocytomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIc.Intracranial and intraspinal embryonal tumors	0	1	0	0	0	1	0.00	16.68	0.00	0.00	0.00	3.80	4.19
IIId.Other gliomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	0	0	0	1	0	1	0.00	0.00	0.00	15.61	0.00	3.80	3.68
IV.Neuroblastoma and other peripheral nervous cell tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
IVa.Neuroblastoma and ganglioneuroblastoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
V.Retinoblastoma	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
VI.Renal tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
VIa.Nephroblastoma and other nonepithelial renal tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIc.Unspecified malignant renal tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VII.Hepatic tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
VIIa.Hepatoblastoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIb.Hepatic carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIII.Malignant bone tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
VIIIa.Osteosarcomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIb.Chondrosarcomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIc.Ewing tumor and related sarcomas of bone	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IX.Soft tissue and other extraosseous sarcomas	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
IXa.Rhabdomyosarcomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXe.Unspecified soft tissue sarcomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xc.Malignant gonadal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xe.Other and unspecified malignant gonadal tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XI.Other malignant epithelial neoplasms & malignant melanomas	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIb.Thyroid carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIc.Nasopharyngeal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XId.Malignant melanomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIe.Skin carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIf.Other and unspecified carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XII.Other and unspecified malignant neoplasms	**0**	**1**	**0**	**0**	**0**	**1**	**0.00**	**16.68**	**0.00**	**0.00**	**0.00**	**3.80**	**4.19**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIIb.Other and unspecified malignant tumors	0	1	0	0	0	1	0.00	16.68	0.00	0.00	0.00	3.80	4.19
All Neoplasms	**0**	**2**	**1**	**2**	**0**	**5**	**0.00**	**33.36**	**15.24**	**31.22**	**0.00**	**19.02**	**19.73**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

Table 47. Absolute incidence by sex and type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Palmas, 2000 to 2003*

Pediatric Tumors - Groups	Male								Female							
	Number of cases						Rates per million		Number of cases						Rates per million	
	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*
I.Leukemia	**0**	**0**	**1**	**1**	**0**	**2**	**15.41**	**15.31**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
Ia.Lymphoid leukemia	0	0	1	1	0	2	15.41	15.31	0	0	0	0	0	0	0.00	0.00
Ib.Acute myeloid leukemia	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Ic.Chronic myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Ie.Unspecified and other specified leukemias	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
II.Lymphomas and reticuloendothelial neoplasms	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
IIa.Hodgkin lymphomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIc.Burkitt lymphoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IId.Miscellaneous lymphoreticular neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIe.Unspecified lymphomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**0**	**1**	**0**	**1**	**0**	**2**	**15.41**	**15.77**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
IIIa.Ependymomas and choroid plexus tumor	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIb.Astrocytomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIc.Intracranial and intraspinal embryonal tumors	0	1	0	0	0	1	7.71	8.27	0	0	0	0	0	0	0.00	0.00
IIId.Other gliomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	0	0	0	1	0	1	7.71	7.50	0	0	0	0	0	0	0.00	0.00
IV.Neuroblastoma and other peripheral nervous cell tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
IVa.Neuroblastoma and ganglioneuroblastoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
V.Retinoblastoma	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
VI.Renal tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
VIa.Nephroblastoma and other nonepithelial renal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIc.Unspecified malignant renal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VII.Hepatic tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
VIIa.Hepatoblastoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIb.Hepatic carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIII.Malignant bone tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
VIIIa.Osteosarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIb.Chondrosarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIc.Ewing tumor and related sarcomas of bone	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IX.Soft tissue and other extraosseous sarcomas	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
IXa.Rhabdomyosarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXe.Unspecified soft tissue sarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xc.Malignant gonadal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xe.Other and unspecified malignant gonadal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XI.Other malignant epithelial neoplasms & malignant melanomas	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIb.Thyroid carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIc.Nasopharyngeal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XId.Malignant melanomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIe.Skin carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIf.Other and unspecified carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XII.Other and unspecified malignant neoplasms	**0**	**1**	**0**	**0**	**0**	**1**	**7.71**	**8.27**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIIb.Other and unspecified malignant tumors	0	1	0	0	0	1	7.71	8.27	0	0	0	0	0	0	0.00	0.00
All Neoplasms	**0**	**2**	**1**	**2**	**0**	**5**	**38.53**	**39.35**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

PBCR of Porto Alegre/RS

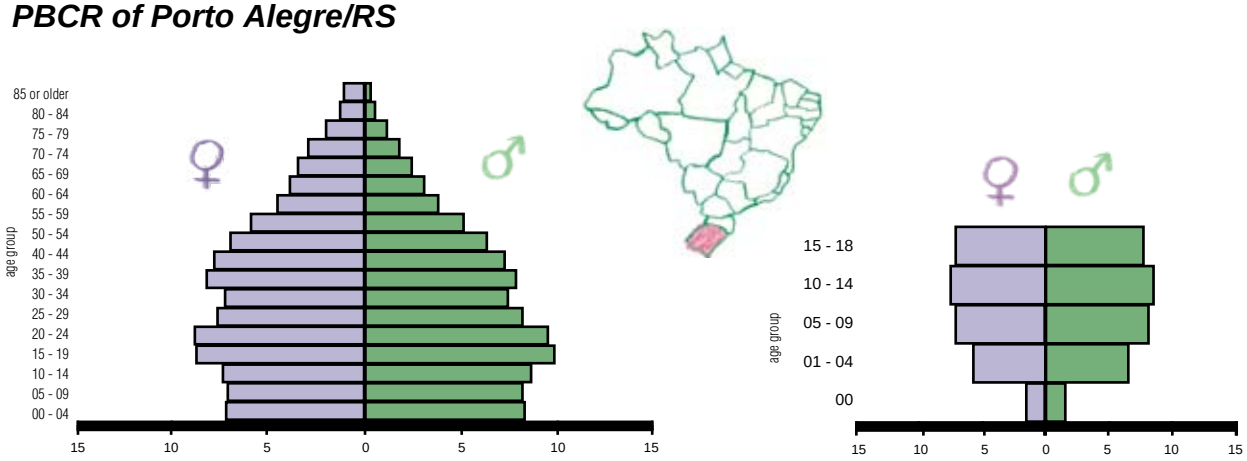

Figure 44. Population Distribution of Porto Alegre

*Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Coverage area

The PBCR of Porto Alegre covers the municipality of Porto Alegre, which is located in the Southern Region of Brazil and extends 476.3 Km². Approximately 97% of the population (about 1,321,000 inhabitants) lives in urban areas. The city lies 150m bove sea level and the climate is subtropical, affected by polar air masses from the south and tropical air masses from the Atlantic Ocean. The rain is well distributed throughout the year and the average annual temperature is 19.5ºC.

Health care facilities for cancer prevention and control

Health services and programs are offered mainly by 23 public or private hospitals, with 6,730 hospital beds (0.48 per 100 inhabitants). Six of these hospitals are high complexity oncology units and one is an isolated chemotherapy center. There are eight universities, three of which offer medical programs.

Infrastructure and data source

The PBCR was created in 1973 and published its first data from 1979 to 1982 in Cancer Incidence in Five Continents – Volume V. The PBCR relies on fixed financial support.

The registry staff includes a coordinator, who is a medical doctor, a supervisor, two codifiers/typists, and five collectors. The advisory board is composed of a medical epidemiologist, a statistician, and a medical pathologist/oncologist. Data collection actively occurs in 20 notifying sources (hospitals, laboratories, sanatoriums, oncology centers and pathology institutes). The death certificates are obtained from the Mortality Information System – SIM.

Use of Information

In addition to determining the incidence and geographical distribution of cancer in Porto Alegre, the information has been used for studying temporal trends, accessing tracking programs, data supply for epidemiological studies, and administering classes and lectures.

PBCR Team – Porto Alegre

Coordinator
Dr. Paulo Recena Grassi

Supervisor
Berenice D'Avila Salazar

Codifiers/Typists
Berenice D'Avila Salazar

Collectors
Carolina H. Pereira de Mello
Daniel Costa Aguiar
Laura Gioda Martins
Luciana Brosina de Leon
Nathália G. Missima
Tauí de Melo Rocha

Table 48. Population at risk by sex and age-group from 1998 to 2002

Period: 1998 - 2002	Age-group	Male	Female
	< 1	53,522	51,366
	1-4	208,292	200,506
	5-9	263,798	254,005
	10-14	284,740	274,477
	15-18	247,954	247,142
Total	0 to 18	1,058,306	1,027,496
Annual Average	0 to 18	211,661	205,499

Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Table 49. Absolute incidence by type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Porto Alegre, 1998 to 2002*

Pediatric Tumors - Groups	Number of cases						Rates per million						
	0	1-4	5-9	10-14	15-18	0-18	0	1-4	5-9	10-14	15-18	Crude	Adjusted*
I.Leukemia	**3**	**30**	**23**	**25**	**14**	**95**	**28.60**	**73.39**	**44.42**	**44.71**	**28.28**	**45.55**	**47.73**
Ia.Lymphoid leukemia	2	24	18	10	6	60	19.07	58.71	34.76	17.88	12.12	28.77	31.55
Ib.Acute myeloid leukemia	0	3	5	6	6	20	0.00	7.34	9.66	10.73	12.12	9.59	9.18
Ic.Chronic myeloproliferative diseases	0	0	0	2	0	2	0.00	0.00	0.00	3.58	0.00	0.96	0.84
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	0	1	1	2	0.00	0.00	0.00	1.79	2.02	0.96	0.80
Ie.Unspecified and other specified leukemias	1	3	0	6	1	11	9.53	7.34	0.00	10.73	2.02	5.27	5.35
II.Lymphomas and reticuloendothelial neoplasms	**2**	**5**	**10**	**15**	**34**	**66**	**19.07**	**12.23**	**19.31**	**26.82**	**68.67**	**31.64**	**28.59**
IIa.Hodgkin lymphomas	0	1	3	9	22	35	0.00	2.45	5.79	16.09	44.44	16.78	14.30
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	2	1	3	5	9	20	19.07	2.45	5.79	8.94	18.18	9.59	8.86
IIc.Burkitt lymphoma	0	2	3	0	1	6	0.00	4.89	5.79	0.00	2.02	2.88	3.13
IId.Miscellaneous lymphoreticular neoplasms	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIe.Unspecified lymphomas	0	1	1	1	2	5	0.00	2.45	1.93	1.79	4.04	2.40	2.30
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**2**	**19**	**22**	**13**	**10**	**66**	**19.07**	**46.48**	**42.49**	**23.25**	**20.20**	**31.64**	**33.28**
IIIa.Ependymomas and choroid plexus tumor	0	2	0	1	1	4	0.00	4.89	0.00	1.79	2.02	1.92	2.03
IIIb.Astrocytomas	0	3	5	5	1	14	0.00	7.34	9.66	8.94	2.02	6.71	6.86
IIIc.Intracranial and intraspinal embryonal tumors	1	10	9	4	4	28	9.53	24.46	17.38	7.15	8.08	13.42	14.50
IIId.Other gliomas	0	1	3	1	1	6	0.00	2.45	5.79	1.79	2.02	2.88	2.93
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	1	0	0	1	0.00	0.00	1.93	0.00	0.00	0.48	0.51
IIIf.Unspecified intracranial and intraspinal neoplasms	1	3	4	2	3	13	9.53	7.34	7.72	3.58	6.06	6.23	6.45
IV.Neuroblastoma and other peripheral nervous cell tumors	**2**	**9**	**4**	**2**	**0**	**17**	**19.07**	**22.02**	**7.72**	**3.58**	**0.00**	**8.15**	**9.60**
IVa.Neuroblastoma and ganglioneuroblastoma	2	9	4	2	0	17	19.07	22.02	7.72	3.58	0.00	8.15	9.60
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
V.Retinoblastoma	**1**	**9**	**0**	**0**	**0**	**10**	**9.53**	**22.02**	**0.00**	**0.00**	**0.00**	**4.79**	**6.13**
VI.Renal tumors	**1**	**14**	**6**	**3**	**1**	**25**	**9.53**	**34.25**	**11.59**	**5.36**	**2.02**	**11.99**	**13.88**
VIa.Nephroblastoma and other nonepithelial renal tumors	1	13	4	1	1	20	9.53	31.80	7.72	1.79	2.02	9.59	11.41
VIb.Renal carcinomas	0	0	1	2	0	3	0.00	0.00	1.93	3.58	0.00	1.44	1.35
VIc.Unspecified malignant renal tumors	0	1	1	0	0	2	0.00	2.45	1.93	0.00	0.00	0.96	1.12
VII.Hepatic tumors	**1**	**2**	**0**	**1**	**0**	**4**	**9.53**	**4.89**	**0.00**	**1.79**	**0.00**	**1.92**	**2.25**
VIIa.Hepatoblastoma	1	2	0	1	0	4	9.53	4.89	0.00	1.79	0.00	1.92	2.25
VIIb.Hepatic carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIII.Malignant bone tumors	**2**	**0**	**3**	**9**	**8**	**22**	**19.07**	**0.00**	**5.79**	**16.09**	**16.16**	**10.55**	**9.55**
VIIIa.Osteosarcomas	1	0	3	6	6	16	9.53	0.00	5.79	10.73	12.12	7.67	6.93
VIIIb.Chondrosarcomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIc.Ewing tumor and related sarcomas of bone	0	0	0	3	2	5	0.00	0.00	0.00	5.36	4.04	2.40	2.03
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIe.Unspecified malignant bone tumors	1	0	0	0	0	1	9.53	0.00	0.00	0.00	0.00	0.48	0.60
IX.Soft tissue and other extraosseous sarcomas	**0**	**8**	**4**	**12**	**7**	**31**	**0.00**	**19.57**	**7.72**	**21.46**	**14.14**	**14.86**	**14.66**
IXa.Rhabdomyosarcomas	0	7	0	5	2	14	0.00	17.12	0.00	8.94	4.04	6.71	7.17
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	0	1	3	2	6	0.00	0.00	1.93	5.36	4.04	2.88	2.53
IXc.Kaposi sarcoma	0	0	0	1	0	1	0.00	0.00	0.00	1.79	0.00	0.48	0.42
IXd.Other specified soft tissue sarcomas	0	1	3	2	0	6	0.00	2.45	5.79	3.58	0.00	2.88	2.97
IXe.Unspecified soft tissue sarcomas	0	0	0	1	3	4	0.00	0.00	0.00	1.79	6.06	1.92	1.56
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**1**	**1**	**1**	**6**	**13**	**22**	**9.53**	**2.45**	**1.93**	**10.73**	**26.26**	**10.55**	**9.20**
Xa.Intracranial and intraspinal germ cell tumors	0	0	1	3	0	4	0.00	0.00	1.93	5.36	0.00	1.92	1.77
Xb.Malignant extracranial and extragonadal germ cell tumors	0	1	0	0	3	4	0.00	2.45	0.00	0.00	6.06	1.92	1.76
Xc.Malignant gonadal germ cell tumors	1	0	0	1	8	10	9.53	0.00	0.00	1.79	16.16	4.79	4.07
Xd.Gonadal carcinomas	0	0	0	2	1	3	0.00	0.00	0.00	3.58	2.02	1.44	1.22
Xe.Other and unspecified malignant gonadal tumors	0	0	0	0	1	1	0.00	0.00	0.00	0.00	2.02	0.48	0.38
XI.Other malignant epithelial neoplasms & malignant melanomas	**0**	**3**	**2**	**6**	**17**	**28**	**0.00**	**7.34**	**3.86**	**10.73**	**34.34**	**13.42**	**11.86**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIb.Thyroid carcinomas	0	0	0	2	4	6	0.00	0.00	0.00	3.58	8.08	2.88	2.37
XIc.Nasopharyngeal carcinomas	0	0	0	1	0	1	0.00	0.00	0.00	1.79	0.00	0.48	0.42
XId.Malignant melanomas	0	1	0	1	5	7	0.00	2.45	0.00	1.79	10.10	3.36	2.94
XIe.Skin carcinomas	0	0	1	1	1	3	0.00	0.00	1.93	1.79	2.02	1.44	1.31
XIf.Other and unspecified carcinomas	0	2	1	1	7	11	0.00	4.89	1.93	1.79	14.14	5.27	4.82
XII.Other and unspecified malignant neoplasms	**1**	**3**	**3**	**3**	**4**	**14**	**9.53**	**7.34**	**5.79**	**5.36**	**8.08**	**6.71**	**6.75**
XIIa.Other specified malignant tumors	0	0	1	0	0	1	0.00	0.00	1.93	0.00	0.00	0.48	0.51
XIIb.Other and unspecified malignant tumors	1	3	2	3	4	13	9.53	7.34	3.86	5.36	8.08	6.23	6.24
All Neoplasms	**16**	**103**	**78**	**95**	**108**	**400**	**152.54**	**251.96**	**150.64**	**169.88**	**218.14**	**191.77**	**193.48**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

Table 50. Absolute incidence by sex and type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Porto Alegre, 1998 to 2002*

Pediatric Tumors - Groups	Male								Female							
	Number of cases						Rates per million		Number of cases						Rates per million	
	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*
I.Leukemia	**0**	**21**	**14**	**16**	**8**	**59**	**55.75**	**58.55**	**3**	**9**	**9**	**9**	**6**	**36**	**35.04**	**36.53**
Ia.Lymphoid leukemia	0	17	11	7	3	38	35.91	39.50	2	7	7	3	3	22	21.41	23.30
Ib.Acute myeloid leukemia	0	2	3	2	3	10	9.45	9.33	0	1	2	4	3	10	9.73	9.04
Ic.Chronic myeloproliferative diseases	0	0	0	2	0	2	1.89	1.65	0	0	0	0	0	0	0.00	0.00
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	0	0	1	1	0.94	0.76	0	0	0	1	0	1	0.97	0.86
Ie.Unspecified and other specified leukemias	0	2	0	5	1	8	7.56	7.31	1	1	0	1	0	3	2.92	3.33
II.Lymphomas and reticuloendothelial neoplasms	**2**	**2**	**7**	**7**	**23**	**41**	**38.74**	**34.98**	**0**	**3**	**3**	**8**	**11**	**25**	**24.33**	**22.11**
IIa.Hodgkin lymphomas	0	1	2	3	13	19	17.95	15.56	0	0	1	6	9	16	15.57	13.04
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	2	0	2	3	7	14	13.23	12.14	0	1	1	2	2	6	5.84	5.53
IIc.Burkitt lymphoma	0	0	2	0	1	3	2.83	2.74	0	2	1	0	0	3	2.92	3.54
IId.Miscellaneous lymphoreticular neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIe.Unspecified lymphomas	0	1	1	1	2	5	4.72	4.55	0	0	0	0	0	0	0.00	0.00
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**2**	**10**	**8**	**12**	**6**	**38**	**35.91**	**36.84**	**0**	**9**	**14**	**1**	**4**	**28**	**27.25**	**29.62**
IIIa.Ependymomas and choroid plexus tumor	0	1	0	1	0	2	1.89	2.03	0	1	0	0	1	2	1.95	2.02
IIIb.Astrocytomas	0	1	1	5	0	7	6.61	6.34	0	2	4	0	1	7	6.81	7.39
IIIc.Intracranial and intraspinal embryonal tumors	1	5	3	3	3	15	14.17	14.95	0	5	6	1	1	13	12.65	14.07
IIId.Other gliomas	0	1	2	1	0	4	3.78	4.02	0	0	1	0	1	2	1.95	1.79
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	1	0	0	1	0.97	1.03
IIIf.Unspecified intracranial and intraspinal neoplasms	1	2	2	2	3	10	9.45	9.51	0	1	2	0	0	3	2.92	3.31
IV.Neuroblastoma and other peripheral nervous cell tumors	**2**	**5**	**2**	**0**	**0**	**9**	**8.50**	**10.37**	**0**	**4**	**2**	**2**	**0**	**8**	**7.79**	**8.79**
IVa.Neuroblastoma and ganglioneuroblastoma	2	5	2	0	0	9	8.50	10.37	0	4	2	2	0	8	7.79	8.79
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
V.Retinoblastoma	**1**	**5**	**0**	**0**	**0**	**6**	**5.67**	**7.21**	**0**	**4**	**0**	**0**	**0**	**4**	**3.89**	**5.01**
VI.Renal tumors	**0**	**7**	**4**	**3**	**1**	**15**	**14.17**	**15.66**	**1**	**7**	**2**	**0**	**0**	**10**	**9.73**	**12.06**
VIa.Nephroblastoma and other nonepithelial renal tumors	0	7	2	1	1	11	10.39	12.02	1	6	2	0	0	9	8.76	10.80
VIb.Renal carcinomas	0	0	1	2	0	3	2.83	2.65	0	0	0	0	0	0	0.00	0.00
VIc.Unspecified malignant renal tumors	0	0	1	0	0	1	0.94	0.99	0	1	0	0	0	1	0.97	1.25
VII.Hepatic tumors	**0**	**1**	**0**	**1**	**0**	**2**	**1.89**	**2.03**	**1**	**1**	**0**	**0**	**0**	**2**	**1.95**	**2.48**
VIIa.Hepatoblastoma	0	1	0	1	0	2	1.89	2.03	1	1	0	0	0	2	1.95	2.48
VIIb.Hepatic carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIII.Malignant bone tumors	**1**	**0**	**2**	**4**	**4**	**11**	**10.39**	**9.51**	**1**	**0**	**1**	**5**	**4**	**11**	**10.71**	**9.60**
VIIIa.Osteosarcomas	1	0	2	3	3	9	8.50	7.92	0	0	1	3	3	7	6.81	5.89
VIIIb.Chondrosarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIc.Ewing tumor and related sarcomas of bone	0	0	0	1	1	2	1.89	1.59	0	0	0	2	1	3	2.92	2.48
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	1	0	0	0	0	1	0.97	1.22
IX.Soft tissue and other extraosseous sarcomas	**0**	**5**	**2**	**7**	**3**	**17**	**16.06**	**16.09**	**0**	**3**	**2**	**5**	**4**	**14**	**13.63**	**13.16**
IXa.Rhabdomyosarcomas	0	5	0	3	1	9	8.50	9.28	0	2	0	2	1	5	4.87	4.99
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	0	1	1	1	3	2.83	2.58	0	0	0	2	1	3	2.92	2.48
IXc.Kaposi sarcoma	0	0	0	1	0	1	0.94	0.83	0	0	0	0	0	0	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	0	1	2	0	3	2.83	2.65	0	1	2	0	0	3	2.92	3.31
IXe.Unspecified soft tissue sarcomas	0	0	0	0	1	1	0.94	0.76	0	0	0	1	2	3	2.92	2.38
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**1**	**0**	**0**	**2**	**9**	**12**	**11.34**	**9.67**	**0**	**1**	**1**	**4**	**4**	**10**	**9.73**	**8.77**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	2	0	2	1.89	1.65	0	0	1	1	0	2	1.95	1.89
Xb.Malignant extracranial and extragonadal germ cell tumors	0	0	0	0	2	2	1.89	1.52	0	1	0	0	1	2	1.95	2.02
Xc.Malignant gonadal germ cell tumors	1	0	0	0	7	8	7.56	6.49	0	0	0	1	1	2	1.95	1.62
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	2	1	3	2.92	2.48
Xe.Other and unspecified malignant gonadal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	1	1	0.97	0.76
XI.Other malignant epithelial neoplasms & malignant melanomas	**0**	**2**	**2**	**2**	**10**	**16**	**15.12**	**13.65**	**0**	**1**	**0**	**4**	**7**	**12**	**11.68**	**10.03**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIb.Thyroid carcinomas	0	0	0	0	2	2	1.89	1.52	0	0	0	2	2	4	3.89	3.24
XIc.Nasopharyngeal carcinomas	0	0	0	1	0	1	0.94	0.83	0	0	0	0	0	0	0.00	0.00
XId.Malignant melanomas	0	0	0	1	2	3	2.83	2.35	0	1	0	0	3	4	3.89	3.54
XIe.Skin carcinomas	0	0	1	0	1	2	1.89	1.75	0	0	0	1	0	1	0.97	0.86
XIf.Other and unspecified carcinomas	0	2	1	0	5	8	7.56	7.21	0	0	0	1	2	3	2.92	2.38
XII.Other and unspecified malignant neoplasms	**1**	**2**	**3**	**1**	**0**	**7**	**6.61**	**7.39**	**0**	**1**	**0**	**2**	**4**	**7**	**6.81**	**6.02**
XIIa.Other specified malignant tumors	0	0	1	0	0	1	0.94	0.99	0	0	0	0	0	0	0.00	0.00
XIIb.Other and unspecified malignant tumors	1	2	2	1	0	6	5.67	6.40	0	1	0	2	4	7	6.81	6.02
All Neoplasms	**10**	**60**	**44**	**55**	**64**	**233**	**220.16**	**221.95**	**6**	**43**	**34**	**40**	**44**	**167**	**162.53**	**164.17**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

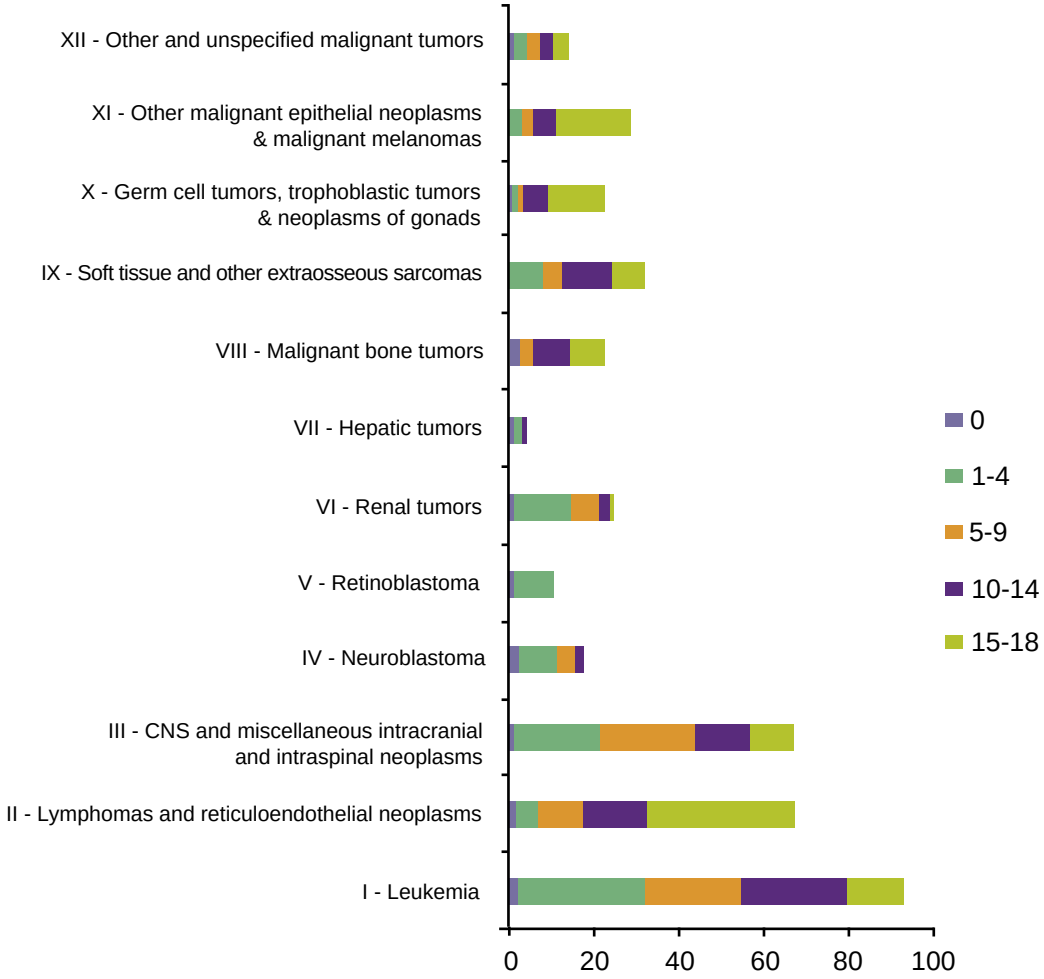

Figure 45. Number of cases by type of childhood cancer, by age-group, Porto Alegre, 1998 to 2002

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

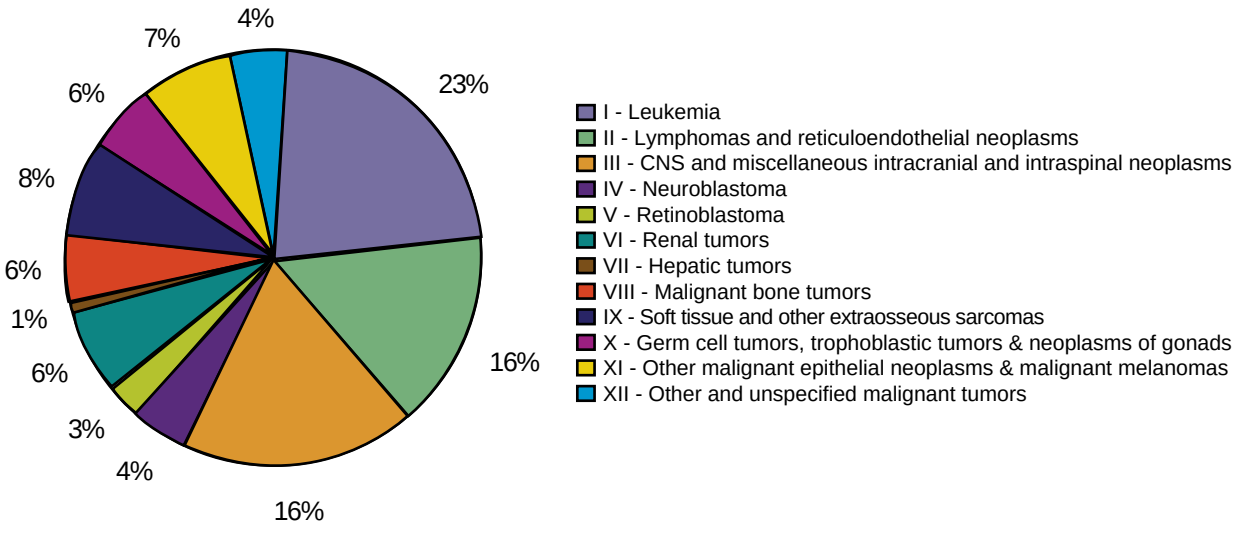

Figure 46. Percentage distribution of incidence by type of childhood cancer, Porto Alegre, 1998 to 2002

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

PBCR of Recife/PE

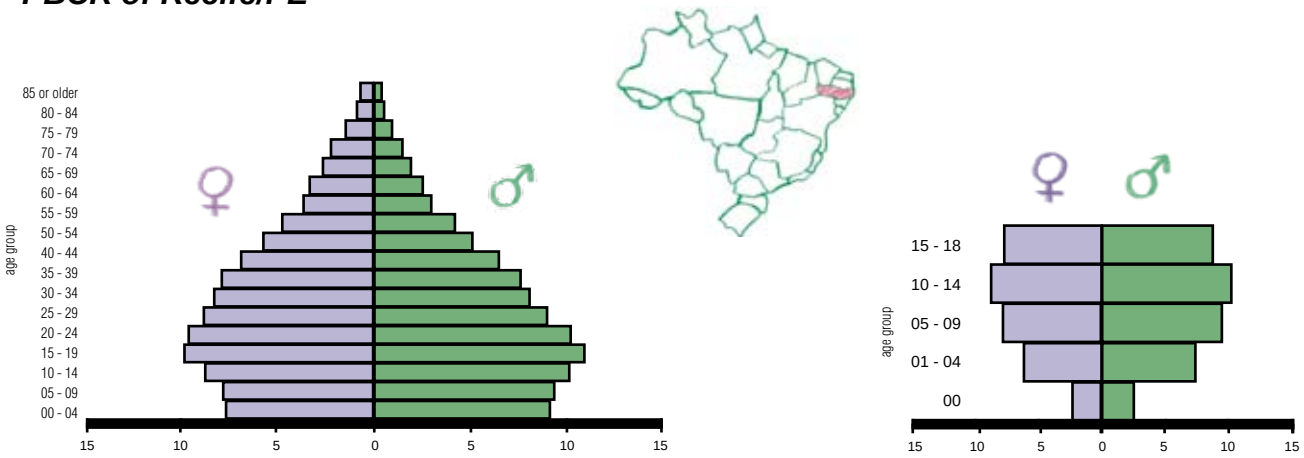

Figure 47. Population Distribution of Recife

*Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Coverage area

Recife's PBCR covers the municipality of Recife, located in the Northeastern Region of Brazil. Recife extends 217.78 Km² and has a population of 1,528,970 inhabitants. One hundred percent of the population lives in urban areas, with an annual growth rate of 1.38 (1996/2000). They city lies 4m above sea level and its climate is considered temperate, with an average annual temperature of 29ºC.

Health care facilities for cancer prevention and control

Health services and programs are offered by 602 institutions, 73 of which are both public and private hospitals. Recife has 8,834 hospital beds, and 164 of them are intended for oncology patients. Nineteen establishments (both state-run and private) render specialized oncology services. The municipal basic health institutions (227 Family Health Teams) offer programs for cancer prevention and early detection. It should be highlighted that the high complexity healthcare units, which are the responsibility of the federal government (SUS), are currently run by the state government.

Infrastructure and data source

The PBCR was created in 1995 and data collection began in 1996. Between 1995 and 2002, it was under the coordination of the State Department of Health and, since 2003, it is run by the Municipal Department of Health. As of 2006, the PBCR relies on fixed financial support. The registry's staff includes a coordinator, six registrars, and one codifier. Data collection actively occurs in 21 notifying sources: one specialized hospital, three university hospitals, nine general hospitals, one anatomical pathology laboratory, two hematology services, two oncology clinics, two radiotherapy services, one chemotherapy service. The death certificates are obtained from the Mortality Information System – SIM.

Use of Information

In addition to determining the incidence and geographic distribution of cancer in Recife, the information has been used for studying temporal trends, data supply for epidemiological studies, and for administering classes and lectures.

PBCR Team – Recife

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Table 51. Population at risk by sex and age-group from 1997 to 2001

Period: 1997 - 2001	Age-group	Male	Female
	< 1	58,262	57,281
	1-4	240,471	232,363
	5-9	317,286	307,854
	10-14	342,913	339,544
	15-18	285,110	295,610
Total	0 to 18	1,244,042	1,232,652
Annual Average	0 to 18	248,808	246,530

Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Table 52. Absolute incidence by type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Recife, 1997 to 2001*

Pediatric Tumors - Groups	Number of cases						Rates per million						
	0	1-4	5-9	10-14	15-18	0-18	0	1-4	5-9	10-14	15-18	Crude	Adjusted*
I.Leukemia	**2**	**36**	**26**	**42**	**11**	**117**	**17.31**	**76.14**	**41.59**	**61.54**	**18.94**	**47.24**	**49.18**
Ia.Lymphoid leukemia	2	33	20	30	9	94	17.31	69.79	31.99	43.96	15.50	37.95	40.28
Ib.Acute myeloid leukemia	0	1	4	8	1	14	0.00	2.11	6.40	11.72	1.72	5.65	5.29
Ic.Chronic myeloproliferative diseases	0	1	0	2	1	4	0.00	2.11	0.00	2.93	1.72	1.62	1.55
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	1	2	0	3	0.00	0.00	1.60	2.93	0.00	1.21	1.11
Ie.Unspecified and other specified leukemias	0	1	1	0	0	2	0.00	2.11	1.60	0.00	0.00	0.81	0.95
II.Lymphomas and reticuloendothelial neoplasms	**0**	**8**	**16**	**16**	**22**	**62**	**0.00**	**16.92**	**25.59**	**23.44**	**37.88**	**25.03**	**23.62**
IIa.Hodgkin lymphomas	0	0	8	6	13	27	0.00	0.00	12.80	8.79	22.39	10.90	9.64
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	5	4	8	2	19	0.00	10.57	6.40	11.72	3.44	7.67	7.74
IIc.Burkitt lymphoma	0	2	2	1	5	10	0.00	4.23	3.20	1.47	8.61	4.04	3.87
IId.Miscellaneous lymphoreticular neoplasms	0	0	1	0	0	1	0.00	0.00	1.60	0.00	0.00	0.40	0.42
IIe.Unspecified lymphomas	0	1	1	1	2	5	0.00	2.11	1.60	1.47	3.44	2.02	1.94
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**1**	**17**	**11**	**15**	**11**	**55**	**8.65**	**35.95**	**17.60**	**21.98**	**18.94**	**22.21**	**22.93**
IIIa.Ependymomas and choroid plexus tumor	0	1	0	2	0	3	0.00	2.11	0.00	2.93	0.00	1.21	1.22
IIIb.Astrocytomas	0	7	2	5	2	16	0.00	14.80	3.20	7.33	3.44	6.46	6.93
IIIc.Intracranial and intraspinal embryonal tumors	0	2	0	3	3	8	0.00	4.23	0.00	4.40	5.17	3.23	3.07
IIId.Other gliomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	1	7	9	5	6	28	8.65	14.80	14.40	7.33	10.33	11.31	11.71
IV.Neuroblastoma and other peripheral nervous cell tumors	**3**	**11**	**3**	**1**	**0**	**18**	**25.96**	**23.26**	**4.80**	**1.47**	**0.00**	**7.27**	**9.08**
IVa.Neuroblastoma and ganglioneuroblastoma	3	11	3	1	0	18	25.96	23.26	4.80	1.47	0.00	7.27	9.08
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
V.Retinoblastoma	**2**	**4**	**2**	**0**	**0**	**8**	**17.31**	**8.46**	**3.20**	**0.00**	**0.00**	**3.23**	**4.05**
VI.Renal tumors	**0**	**12**	**10**	**1**	**0**	**23**	**0.00**	**25.38**	**16.00**	**1.47**	**0.00**	**9.29**	**10.91**
VIa.Nephroblastoma and other nonepithelial renal tumors	0	12	10	1	0	23	0.00	25.38	16.00	1.47	0.00	9.29	10.91
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIc.Unspecified malignant renal tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VII.Hepatic tumors	**1**	**0**	**1**	**2**	**0**	**4**	**8.65**	**0.00**	**1.60**	**2.93**	**0.00**	**1.62**	**1.65**
VIIa.Hepatoblastoma	0	0	0	1	0	1	0.00	0.00	0.00	1.47	0.00	0.40	0.35
VIIb.Hepatic carcinomas	0	0	1	1	0	2	0.00	0.00	1.60	1.47	0.00	0.81	0.76
VIIc.Unspecified malignant hepatic tumors	1	0	0	0	0	1	8.65	0.00	0.00	0.00	0.00	0.40	0.54
VIII.Malignant bone tumors	**0**	**2**	**3**	**7**	**9**	**21**	**0.00**	**4.23**	**4.80**	**10.26**	**15.50**	**8.48**	**7.66**
VIIIa.Osteosarcomas	0	1	1	5	6	13	0.00	2.11	1.60	7.33	10.33	5.25	4.62
VIIIb.Chondrosarcomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIc.Ewing tumor and related sarcomas of bone	0	0	1	0	3	4	0.00	0.00	1.60	0.00	5.17	1.62	1.39
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	1	1	2	0	4	0.00	2.11	1.60	2.93	0.00	1.62	1.64
IX.Soft tissue and other extraosseous sarcomas	**0**	**7**	**1**	**8**	**8**	**24**	**0.00**	**14.80**	**1.60**	**11.72**	**13.78**	**9.69**	**9.50**
IXa.Rhabdomyosarcomas	0	3	1	3	3	10	0.00	6.34	1.60	4.40	5.17	4.04	4.02
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	2	0	1	1	4	0.00	4.23	0.00	1.47	1.72	1.62	1.73
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	0	0	1	2	3	0.00	0.00	0.00	1.47	3.44	1.21	0.99
IXe.Unspecified soft tissue sarcomas	0	2	0	3	2	7	0.00	4.23	0.00	4.40	3.44	2.83	2.75
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**1**	**2**	**2**	**5**	**2**	**12**	**8.65**	**4.23**	**3.20**	**7.33**	**3.44**	**4.85**	**4.82**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	1	1	0	2	0	4	8.65	2.11	0.00	2.93	0.00	1.62	1.77
Xc.Malignant gonadal germ cell tumors	0	0	2	2	2	6	0.00	0.00	3.20	2.93	3.44	2.42	2.18
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xe.Other and unspecified malignant gonadal tumors	0	1	0	1	0	2	0.00	2.11	0.00	1.47	0.00	0.81	0.88
XI.Other malignant epithelial neoplasms & malignant melanomas	**1**	**2**	**1**	**3**	**13**	**20**	**8.65**	**4.23**	**1.60**	**4.40**	**22.39**	**8.08**	**7.28**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIb.Thyroid carcinomas	0	0	0	0	6	6	0.00	0.00	0.00	0.00	10.33	2.42	1.95
XIc.Nasopharyngeal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XId.Malignant melanomas	0	0	0	0	1	1	0.00	0.00	0.00	0.00	1.72	0.40	0.32
XIe.Skin carcinomas	0	1	0	0	1	2	0.00	2.11	0.00	0.00	1.72	0.81	0.86
XIf.Other and unspecified carcinomas	1	1	1	3	5	11	8.65	2.11	1.60	4.40	8.61	4.44	4.15
XII.Other and unspecified malignant neoplasms	**4**	**4**	**10**	**11**	**13**	**42**	**34.62**	**8.46**	**16.00**	**16.12**	**22.39**	**16.96**	**16.51**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIIb.Other and unspecified malignant tumors	4	4	10	11	13	42	34.62	8.46	16.00	16.12	22.39	16.96	16.51
All Neoplasms	**15**	**105**	**86**	**111**	**89**	**406**	**129.82**	**222.07**	**137.57**	**162.65**	**153.26**	**163.93**	**167.18**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

Table 53. Absolute incidence by sex and type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Recife, 1997 to 2001*

Pediatric Tumors - Groups	Male								Female							
	Number of cases						Rates per million		Number of cases						Rates per million	
	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*
I.Leukemia	**0**	**18**	**13**	**25**	**6**	**62**	**49.84**	**50.68**	**2**	**18**	**13**	**16**	**5**	**54**	**43.81**	**47.01**
Ia.Lymphoid leukemia	0	18	8	17	5	48	38.58	40.40	2	15	12	12	4	45	36.51	39.50
Ib.Acute myeloid leukemia	0	0	3	7	1	11	8.84	7.95	0	1	1	1	0	3	2.43	2.63
Ic.Chronic myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0	1	0	2	1	4	3.25	3.11
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	1	1	0	2	1.61	1.51	0	0	0	1	0	1	0.81	0.69
Ie.Unspecified and other specified leukemias	0	0	1	0	0	1	0.80	0.83	0	1	0	0	0	1	0.81	1.08
II.Lymphomas and reticuloendothelial neoplasms	**0**	**3**	**12**	**12**	**12**	**39**	**31.35**	**29.21**	**0**	**5**	**4**	**4**	**10**	**23**	**18.66**	**17.96**
IIa.Hodgkin lymphomas	0	0	6	4	5	15	12.06	11.00	0	0	2	2	8	12	9.74	8.19
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	3	3	6	2	14	11.25	11.05	0	2	1	2	0	5	4.06	4.40
IIc.Burkitt lymphoma	0	0	2	1	3	6	4.82	4.32	0	2	0	0	2	4	3.25	3.44
IId.Miscellaneous lymphoreticular neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	1	0	0	1	0.81	0.85
IIe.Unspecified lymphomas	0	0	1	1	2	4	3.22	2.83	0	1	0	0	0	1	0.81	1.08
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**1**	**7**	**7**	**7**	**3**	**25**	**20.10**	**20.96**	**0**	**10**	**4**	**8**	**8**	**30**	**24.34**	**24.87**
IIIa.Ependymomas and choroid plexus tumor	0	1	0	1	0	2	1.61	1.73	0	0	0	1	0	1	0.81	0.69
IIIb.Astrocytomas	0	3	2	1	1	7	5.63	6.13	0	4	0	4	1	9	7.30	7.74
IIIc.Intracranial and intraspinal embryonal tumors	0	0	0	2	1	3	2.41	2.04	0	2	0	1	2	5	4.06	4.13
IIId.Other gliomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	1	3	5	3	1	13	10.45	11.06	0	4	4	2	5	15	12.17	12.30
IV.Neuroblastoma and other peripheral nervous cell tumors	**3**	**9**	**1**	**1**	**0**	**14**	**11.25**	**14.15**	**0**	**2**	**2**	**0**	**0**	**4**	**3.25**	**3.86**
IVa.Neuroblastoma and ganglioneuroblastoma	3	9	1	1	0	14	11.25	14.15	0	2	2	0	0	4	3.25	3.86
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
V.Retinoblastoma	**0**	**4**	**2**	**0**	**0**	**6**	**4.82**	**5.83**	**2**	**0**	**0**	**0**	**0**	**2**	**1.62**	**2.19**
VI.Renal tumors	**0**	**6**	**4**	**1**	**0**	**11**	**8.84**	**10.26**	**0**	**6**	**6**	**0**	**0**	**12**	**9.74**	**11.59**
VIa.Nephroblastoma and other nonepithelial renal tumors	0	6	4	1	0	11	8.84	10.26	0	6	6	0	0	12	9.74	11.59
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIc.Unspecified malignant renal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VII.Hepatic tumors	**1**	**0**	**1**	**1**	**0**	**3**	**2.41**	**2.59**	**0**	**0**	**0**	**1**	**0**	**1**	**0.81**	**0.69**
VIIa.Hepatoblastoma	0	0	0	0	0	0	0.00	0.00	0	0	0	1	0	1	0.81	0.69
VIIb.Hepatic carcinomas	0	0	1	1	0	2	1.61	1.51	0	0	0	0	0	0	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	1	0	0	0	0	1	0.80	1.08	0	0	0	0	0	0	0.00	0.00
VIII.Malignant bone tumors	**0**	**2**	**2**	**0**	**4**	**8**	**6.43**	**6.38**	**0**	**0**	**1**	**7**	**5**	**13**	**10.55**	**8.90**
VIIIa.Osteosarcomas	0	1	0	0	3	4	3.22	3.03	0	0	1	5	3	9	7.30	6.23
VIIIb.Chondrosarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIc.Ewing tumor and related sarcomas of bone	0	0	1	0	1	2	1.61	1.49	0	0	0	0	2	2	1.62	1.28
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	1	1	0	0	2	1.61	1.87	0	0	0	2	0	2	1.62	1.39
IX.Soft tissue and other extraosseous sarcomas	**0**	**2**	**0**	**5**	**6**	**13**	**10.45**	**9.49**	**0**	**5**	**1**	**3**	**2**	**11**	**8.92**	**9.61**
IXa.Rhabdomyosarcomas	0	1	0	2	3	6	4.82	4.40	0	2	1	1	0	4	3.25	3.71
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	1	0	1	0	2	1.61	1.73	0	1	0	0	1	2	1.62	1.72
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	0	0	0	1	1	0.80	0.66	0	0	0	1	1	2	1.62	1.33
IXe.Unspecified soft tissue sarcomas	0	0	0	2	2	4	3.22	2.70	0	2	0	1	0	3	2.43	2.86
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**0**	**2**	**0**	**0**	**2**	**4**	**3.22**	**3.41**	**1**	**0**	**2**	**5**	**0**	**8**	**6.49**	**6.27**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	0	1	0	0	0	1	0.80	1.05	1	0	0	2	0	3	2.43	2.48
Xc.Malignant gonadal germ cell tumors	0	0	0	0	2	2	1.61	1.32	0	0	2	2	0	4	3.25	3.09
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xe.Other and unspecified malignant gonadal tumors	0	1	0	0	0	1	0.80	1.05	0	0	0	1	0	1	0.81	0.69
XI.Other malignant epithelial neoplasms & malignant melanomas	**0**	**1**	**0**	**0**	**5**	**6**	**4.82**	**4.35**	**1**	**1**	**1**	**3**	**8**	**14**	**11.36**	**10.21**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIb.Thyroid carcinomas	0	0	0	0	1	1	0.80	0.66	0	0	0	0	5	5	4.06	3.19
XIc.Nasopharyngeal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XId.Malignant melanomas	0	0	0	0	1	1	0.80	0.66	0	0	0	0	0	0	0.00	0.00
XIe.Skin carcinomas	0	1	0	0	1	2	1.61	1.71	0	0	0	0	0	0	0.00	0.00
XIf.Other and unspecified carcinomas	0	0	0	0	2	2	1.61	1.32	1	1	1	3	3	9	7.30	7.02
XII.Other and unspecified malignant neoplasms	**2**	**3**	**5**	**6**	**4**	**20**	**16.08**	**16.18**	**2**	**1**	**5**	**5**	**9**	**22**	**17.85**	**16.73**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIIb.Other and unspecified malignant tumors	2	3	5	6	4	20	16.08	16.18	2	1	5	5	9	22	17.85	16.73
All Neoplasms	**7**	**57**	**47**	**58**	**42**	**211**	**169.61**	**173.51**	**8**	**48**	**39**	**52**	**47**	**194**	**157.38**	**159.90**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

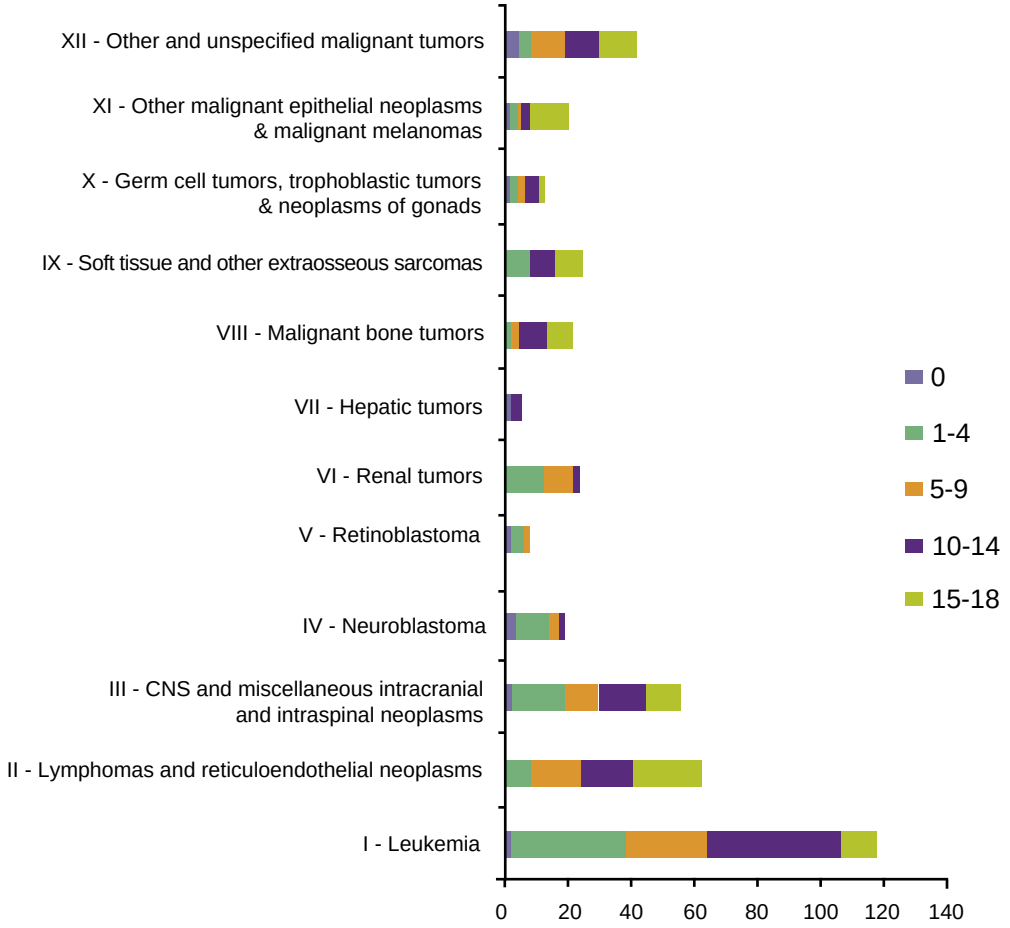

Figure 48. Number of cases by type of childhood cancer, by age-group, Recife, 1997 to 2001

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

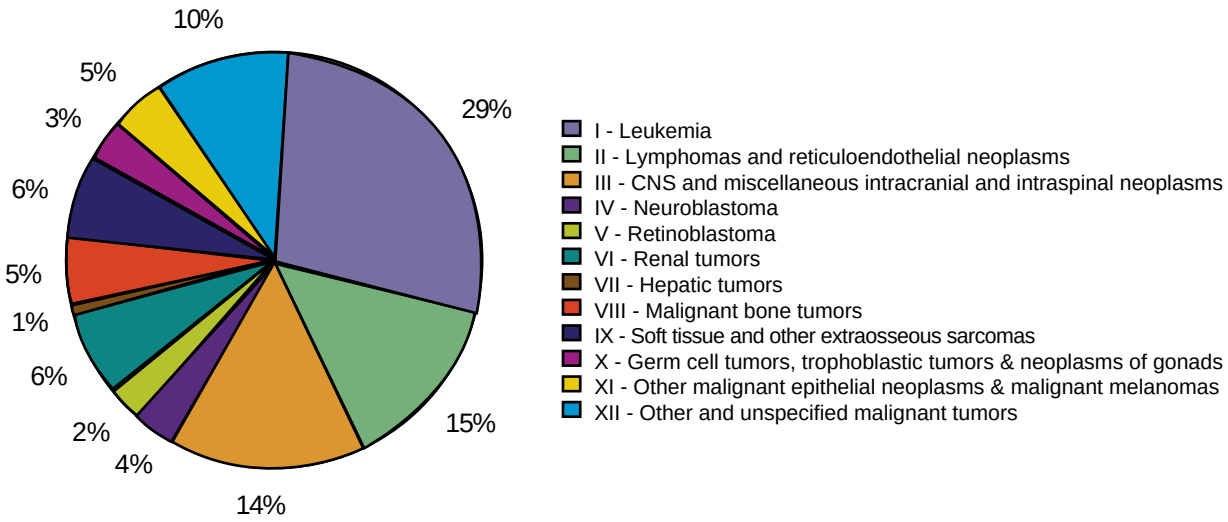

Figure 49. Percentage distribution of incidence by type of childhood cancer, Recife, 1997 to 2001

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

PBCR of Salvador/BA

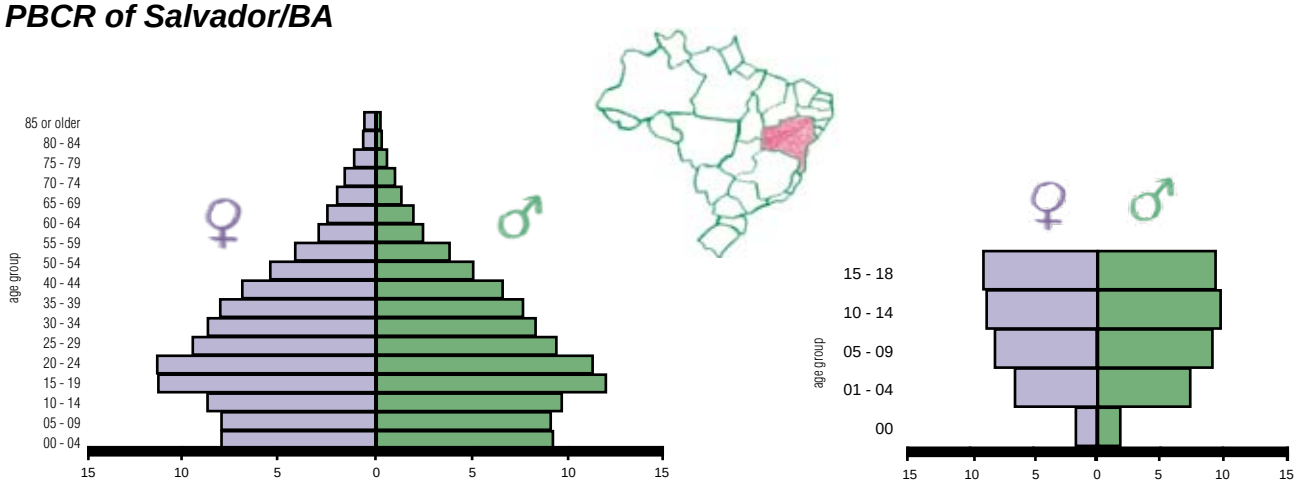

Figure 50. Population Distribution of Salvador

*Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Coverage area

The PBCR of Salvador covers the area of Salvador, located in the Northeastern Region of Brazil. Salvador extends an area of 324.53 Km² and approximately 99.96% of its population (around 2,442,102 inhabitants) lives in urban areas. The annual growth rate is 0.46%. Salvador lies more than 50m above sea level and its climate is humid with an average annual temperature of 25.3ºC.

Health care facilities for cancer prevention and control

Health programs and services are offered by 51 public or private hospitals, with 7,153 hospital beds (0.17 per 100 inhabitants). There are also 30 health units with cancer prevention and early detection programs. Other units for cancer diagnosis and treatment include four radiotherapy services, 11 chemotherapy services and 30 anatomical pathology laboratories. There are three universities, two of which offer medical programs.

Infrastructure and data source

The PBCR was created in 1996 and data collection began in 1997. It is located at Liga Bahiana Contra o Câncer/Hospital Aristides Maltez, Av. D. João VI, 332 - Brotas. The PBCR receives financial aid. It receives funds from the Liga Bahiana Contra o Câncer, and is currently seeking for SESAB participation through a partnership with INCA/MS. The registry staff includes a medical doctor coordinator, one supervisor, two typists, and three registrars. The advisory board is composed of one clinical oncologist, one radiotherapist, one general surgeon, one pathologist, and one gynecologist. Active data collection occurs in 45 notifying sources: one specialized hospital, one university hospital, 14 general hospitals, 28 anatomical pathology laboratories, three hematology services, four oncology clinics, four radiotherapy services, one cytology laboratory. The death certificates are obtained from the Mortality Information System – SIM.

Use of Information

In addition to determining the incidence and geographic distribution of cancer in Salvador, the information has been used for studying temporal trends, accessing tracking programs, data supply for epidemiological studies, and for administering classes and lectures.

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Table 54. Population at risk by sex and age-group from 1998 to 2002

Demographic Census of 2000 - IBGE

Period: 1998 - 2002	Age-group	Male	Female
	< 1	103,521	98,618
	1-4	419,502	403,965
	5-9	526,498	511,063
	10-14	600,098	600,011
	15-18	544,721	582,940
Total	0 to 18	2,194,340	2,196,597
Annual Average	0 to 18	438,868	439,319

Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Table 55. Absolute incidence by type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Salvador, 1998 to 2002*

Pediatric Tumors - Groups	Number of cases						Rates per million						
	0	1-4	5-9	10-14	15-18	0-18	0	1-4	5-9	10-14	15-18	Crude	Adjusted*
I.Leukemia	**0**	**28**	**25**	**23**	**16**	**92**	**0.00**	**34.00**	**24.09**	**19.16**	**14.19**	**20.95**	**22.04**
Ia.Lymphoid leukemia	0	20	18	12	9	59	0.00	24.29	17.35	10.00	7.98	13.44	14.51
Ib.Acute myeloid leukemia	0	5	5	6	2	18	0.00	6.07	4.82	5.00	1.77	4.10	4.30
Ic.Chronic myeloproliferative diseases	0	1	1	3	3	8	0.00	1.21	0.96	2.50	2.66	1.82	1.65
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	1	0	1	0	2	0.00	1.21	0.00	0.83	0.00	0.46	0.50
Ie.Unspecified and other specified leukemias	0	1	1	1	2	5	0.00	1.21	0.96	0.83	1.77	1.14	1.09
II.Lymphomas and reticuloendothelial neoplasms	**0**	**4**	**15**	**18**	**32**	**69**	**0.00**	**4.86**	**14.46**	**15.00**	**28.38**	**15.71**	**13.89**
IIa.Hodgkin lymphomas	0	1	7	10	17	35	0.00	1.21	6.75	8.33	15.08	7.97	6.88
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	3	6	5	12	26	0.00	3.64	5.78	4.17	10.64	5.92	5.42
IIc.Burkitt lymphoma	0	0	2	0	0	2	0.00	0.00	1.93	0.00	0.00	0.46	0.50
IId.Miscellaneous lymphoreticular neoplasms	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIe.Unspecified lymphomas	0	0	0	3	3	6	0.00	0.00	0.00	2.50	2.66	1.37	1.09
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**1**	**17**	**7**	**17**	**5**	**47**	**4.95**	**20.64**	**6.75**	**14.17**	**4.43**	**10.70**	**11.44**
IIIa.Ependymomas and choroid plexus tumor	0	5	0	0	0	5	0.00	6.07	0.00	0.00	0.00	1.14	1.53
IIIb.Astrocytomas	0	7	2	12	4	25	0.00	8.50	1.93	10.00	3.55	5.69	5.67
IIIc.Intracranial and intraspinal embryonal tumors	1	2	5	3	0	11	4.95	2.43	4.82	2.50	0.00	2.51	2.77
IIId.Other gliomas	0	1	0	1	0	2	0.00	1.21	0.00	0.83	0.00	0.46	0.50
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	0	2	0	1	1	4	0.00	2.43	0.00	0.83	0.89	0.91	0.97
IV.Neuroblastoma and other peripheral nervous cell tumors	**5**	**8**	**0**	**0**	**0**	**13**	**24.74**	**9.72**	**0.00**	**0.00**	**0.00**	**2.96**	**4.00**
IVa.Neuroblastoma and ganglioneuroblastoma	5	7	0	0	0	12	24.74	8.50	0.00	0.00	0.00	2.73	3.69
IVb.Other peripheral nervous cell tumors	0	1	0	0	0	1	0.00	1.21	0.00	0.00	0.00	0.23	0.31
V.Retinoblastoma	**2**	**13**	**3**	**0**	**0**	**18**	**9.89**	**15.79**	**2.89**	**0.00**	**0.00**	**4.10**	**5.35**
VI.Renal tumors	**3**	**21**	**5**	**0**	**0**	**29**	**14.84**	**25.50**	**4.82**	**0.00**	**0.00**	**6.60**	**8.60**
VIa.Nephroblastoma and other nonepithelial renal tumors	3	20	5	0	0	28	14.84	24.29	4.82	0.00	0.00	6.38	8.30
VIb.Renal carcinomas	0	1	0	0	0	1	0.00	1.21	0.00	0.00	0.00	0.23	0.31
VIc.Unspecified malignant renal tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VII.Hepatic tumors	**1**	**5**	**2**	**1**	**0**	**9**	**4.95**	**6.07**	**1.93**	**0.83**	**0.00**	**2.05**	**2.54**
VIIa.Hepatoblastoma	1	3	2	0	0	6	4.95	3.64	1.93	0.00	0.00	1.37	1.73
VIIb.Hepatic carcinomas	0	1	0	1	0	2	0.00	1.21	0.00	0.83	0.00	0.46	0.50
VIIc.Unspecified malignant hepatic tumors	0	1	0	0	0	1	0.00	1.21	0.00	0.00	0.00	0.23	0.31
VIII.Malignant bone tumors	**0**	**1**	**3**	**15**	**12**	**31**	**0.00**	**1.21**	**2.89**	**12.50**	**10.64**	**7.06**	**6.01**
VIIIa.Osteosarcomas	0	1	0	12	12	25	0.00	1.21	0.00	10.00	10.64	5.69	4.67
VIIIb.Chondrosarcomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIc.Ewing tumor and related sarcomas of bone	0	0	3	1	0	4	0.00	0.00	2.89	0.83	0.00	0.91	0.95
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	0	0	2	0	2	0.00	0.00	0.00	1.67	0.00	0.46	0.39
IX.Soft tissue and other extraosseous sarcomas	**2**	**6**	**4**	**11**	**11**	**34**	**9.89**	**7.29**	**3.86**	**9.17**	**9.75**	**7.74**	**7.46**
IXa.Rhabdomyosarcomas	0	2	1	4	3	10	0.00	2.43	0.96	3.33	2.66	2.28	2.15
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	1	1	1	0	3	6	4.95	1.21	0.96	0.00	2.66	1.37	1.37
IXc.Kaposi sarcoma	0	0	0	0	1	1	0.00	0.00	0.00	0.00	0.89	0.23	0.17
IXd.Other specified soft tissue sarcomas	0	1	0	3	2	6	0.00	1.21	0.00	2.50	1.77	1.37	1.23
IXe.Unspecified soft tissue sarcomas	1	2	2	4	2	11	4.95	2.43	1.93	3.33	1.77	2.51	2.55
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**2**	**3**	**4**	**1**	**6**	**16**	**9.89**	**3.64**	**3.86**	**0.83**	**5.32**	**3.64**	**3.75**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	2	1	2	0	1	6	9.89	1.21	1.93	0.00	0.89	1.37	1.60
Xc.Malignant gonadal germ cell tumors	0	2	2	1	1	6	0.00	2.43	1.93	0.83	0.89	1.37	1.48
Xd.Gonadal carcinomas	0	0	0	0	3	3	0.00	0.00	0.00	0.00	2.66	0.68	0.50
Xe.Other and unspecified malignant gonadal tumors	0	0	0	0	1	1	0.00	0.00	0.00	0.00	0.89	0.23	0.17
XI.Other malignant epithelial neoplasms & malignant melanomas	**0**	**2**	**2**	**11**	**24**	**39**	**0.00**	**2.43**	**1.93**	**9.17**	**21.28**	**8.88**	**7.29**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIb.Thyroid carcinomas	0	0	1	1	5	7	0.00	0.00	0.96	0.83	4.43	1.59	1.28
XIc.Nasopharyngeal carcinomas	0	0	0	5	0	5	0.00	0.00	0.00	4.17	0.00	1.14	0.98
XId.Malignant melanomas	0	1	0	2	0	3	0.00	1.21	0.00	1.67	0.00	0.68	0.70
XIe.Skin carcinomas	0	0	0	1	5	6	0.00	0.00	0.00	0.83	4.43	1.37	1.03
XIf.Other and unspecified carcinomas	0	1	1	2	14	18	0.00	1.21	0.96	1.67	12.42	4.10	3.29
XII.Other and unspecified malignant neoplasms	**0**	**5**	**2**	**1**	**5**	**13**	**0.00**	**6.07**	**1.93**	**0.83**	**4.43**	**2.96**	**3.06**
XIIa.Other specified malignant tumors	0	0	0	0	2	2	0.00	0.00	0.00	0.00	1.77	0.46	0.33
XIIb.Other and unspecified malignant tumors	0	5	2	1	3	11	0.00	6.07	1.93	0.83	2.66	2.51	2.73
All Neoplasms	**16**	**113**	**72**	**98**	**111**	**410**	**79.15**	**137.22**	**69.39**	**81.66**	**98.43**	**93.37**	**95.42**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
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Table 56. Absolute incidence by sex and type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Salvador, 1998 to 2002*

Pediatric Tumors - Groups	Male								Female							
	Number of cases						Rates per million		Number of cases						Rates per million	
	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*
I.Leukemia	**0**	**15**	**17**	**10**	**12**	**54**	**24.61**	**25.52**	**0**	**13**	**8**	**13**	**4**	**38**	**17.30**	**18.58**
Ia.Lymphoid leukemia	0	13	14	4	8	39	17.77	19.09	0	7	4	8	1	20	9.10	9.87
Ib.Acute myeloid leukemia	0	2	3	3	1	9	4.10	4.21	0	3	2	3	1	9	4.10	4.39
Ic.Chronic myeloproliferative diseases	0	0	0	1	2	3	1.37	1.08	0	1	1	2	1	5	2.28	2.24
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	0	1	0	1	0.46	0.39	0	1	0	0	0	1	0.46	0.62
Ie.Unspecified and other specified leukemias	0	0	0	1	1	2	0.91	0.74	0	1	1	0	1	3	1.37	1.46
II.Lymphomas and reticuloendothelial neoplasms	**0**	**3**	**9**	**12**	**20**	**44**	**20.05**	**17.90**	**0**	**1**	**6**	**6**	**12**	**25**	**11.38**	**9.93**
IIa.Hodgkin lymphomas	0	1	5	8	8	22	10.03	8.99	0	0	2	2	9	13	5.92	4.72
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	2	3	3	9	17	7.75	6.98	0	1	3	2	3	9	4.10	3.91
IIc.Burkitt lymphoma	0	0	1	0	0	1	0.46	0.50	0	0	1	0	0	1	0.46	0.51
IId.Miscellaneous lymphoreticular neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIe.Unspecified lymphomas	0	0	0	1	3	4	1.82	1.43	0	0	0	2	0	2	0.91	0.79
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**1**	**8**	**6**	**6**	**4**	**25**	**11.39**	**12.12**	**0**	**9**	**1**	**11**	**1**	**22**	**10.02**	**10.75**
IIIa.Ependymomas and choroid plexus tumor	0	4	0	0	0	4	1.82	2.40	0	1	0	0	0	1	0.46	0.62
IIIb.Astrocytomas	0	4	1	5	3	13	5.92	5.89	0	3	1	7	1	12	5.46	5.45
IIIc.Intracranial and intraspinal embryonal tumors	1	0	5	0	0	6	2.73	3.09	0	2	0	3	0	5	2.28	2.42
IIId.Other gliomas	0	0	0	0	0	0	0.00	0.00	0	1	0	1	0	2	0.91	1.01
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	0	0	0	1	1	2	0.91	0.74	0	2	0	0	0	2	0.91	1.24
IV.Neuroblastoma and other peripheral nervous cell tumors	**2**	**6**	**0**	**0**	**0**	**8**	**3.65**	**4.81**	**3**	**2**	**0**	**0**	**0**	**5**	**2.28**	**3.16**
IVa.Neuroblastoma and ganglioneuroblastoma	2	5	0	0	0	7	3.19	4.21	3	2	0	0	0	5	2.28	3.16
IVb.Other peripheral nervous cell tumors	0	1	0	0	0	1	0.46	0.60	0	0	0	0	0	0	0.00	0.00
V.Retinoblastoma	**1**	**6**	**1**	**0**	**0**	**8**	**3.65**	**4.70**	**1**	**7**	**2**	**0**	**0**	**10**	**4.55**	**6.02**
VI.Renal tumors	**2**	**11**	**3**	**0**	**0**	**16**	**7.29**	**9.30**	**1**	**10**	**2**	**0**	**0**	**13**	**5.92**	**7.88**
VIa.Nephroblastoma and other nonepithelial renal tumors	2	11	3	0	0	16	7.29	9.30	1	9	2	0	0	12	5.46	7.26
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0	1	0	0	0	1	0.46	0.62
VIc.Unspecified malignant renal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VII.Hepatic tumors	**0**	**5**	**2**	**1**	**0**	**8**	**3.65**	**4.38**	**1**	**0**	**0**	**0**	**0**	**1**	**0.46**	**0.64**
VIIa.Hepatoblastoma	0	3	2	0	0	5	2.28	2.79	1	0	0	0	0	1	0.46	0.64
VIIb.Hepatic carcinomas	0	1	0	1	0	2	0.91	0.99	0	0	0	0	0	0	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	0	1	0	0	0	1	0.46	0.60	0	0	0	0	0	0	0.00	0.00
VIII.Malignant bone tumors	**0**	**0**	**1**	**7**	**4**	**12**	**5.47**	**4.63**	**0**	**1**	**2**	**8**	**8**	**19**	**8.65**	**7.37**
VIIIa.Osteosarcomas	0	0	0	6	4	10	4.56	3.74	0	1	0	6	8	15	6.83	5.56
VIIIb.Chondrosarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIc.Ewing tumor and related sarcomas of bone	0	0	1	1	0	2	0.91	0.89	0	0	2	0	0	2	0.91	1.02
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	2	0	2	0.91	0.79
IX.Soft tissue and other extraosseous sarcomas	**1**	**5**	**2**	**6**	**6**	**20**	**9.11**	**9.03**	**1**	**1**	**2**	**5**	**5**	**14**	**6.37**	**5.86**
IXa.Rhabdomyosarcomas	0	1	0	4	1	6	2.73	2.52	0	1	1	0	2	4	1.82	1.78
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	1	1	1	0	3	6	2.73	2.74	0	0	0	0	0	0	0.00	0.00
IXc.Kaposi sarcoma	0	0	0	0	1	1	0.46	0.35	0	0	0	0	0	0	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	1	0	0	1	2	0.91	0.95	0	0	0	3	1	4	1.82	1.50
IXe.Unspecified soft tissue sarcomas	0	2	1	2	0	5	2.28	2.48	1	0	1	2	2	6	2.73	2.58
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**1**	**2**	**0**	**0**	**1**	**4**	**1.82**	**2.15**	**1**	**1**	**4**	**1**	**5**	**12**	**5.46**	**5.32**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	1	0	0	0	0	1	0.46	0.61	1	1	2	0	1	5	2.28	2.61
Xc.Malignant gonadal germ cell tumors	0	2	0	0	0	2	0.91	1.20	0	0	2	1	1	4	1.82	1.74
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	3	3	1.37	0.97
Xe.Other and unspecified malignant gonadal tumors	0	0	0	0	1	1	0.46	0.35	0	0	0	0	0	0	0.00	0.00
XI.Other malignant epithelial neoplasms & malignant melanomas	**0**	**2**	**2**	**7**	**8**	**19**	**8.66**	**7.71**	**0**	**0**	**0**	**4**	**16**	**20**	**9.10**	**6.74**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIb.Thyroid carcinomas	0	0	1	0	0	1	0.46	0.50	0	0	0	1	5	6	2.73	2.01
XIc.Nasopharyngeal carcinomas	0	0	0	4	0	4	1.82	1.57	0	0	0	1	0	1	0.46	0.39
XId.Malignant melanomas	0	1	0	0	0	1	0.46	0.60	0	0	0	2	0	2	0.91	0.79
XIe.Skin carcinomas	0	0	0	1	3	4	1.82	1.43	0	0	0	0	2	2	0.91	0.65
XIf.Other and unspecified carcinomas	0	1	1	2	5	9	4.10	3.61	0	0	0	0	9	9	4.10	2.91
XII.Other and unspecified malignant neoplasms	**0**	**3**	**1**	**0**	**1**	**5**	**2.28**	**2.64**	**0**	**2**	**1**	**1**	**4**	**8**	**3.64**	**3.44**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	2	2	0.91	0.65
XIIb.Other and unspecified malignant tumors	0	3	1	0	1	5	2.28	2.64	0	2	1	1	2	6	2.73	2.80
All Neoplasms	**8**	**66**	**44**	**49**	**56**	**223**	**101.63**	**104.89**	**8**	**47**	**28**	**49**	**55**	**187**	**85.13**	**85.70**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
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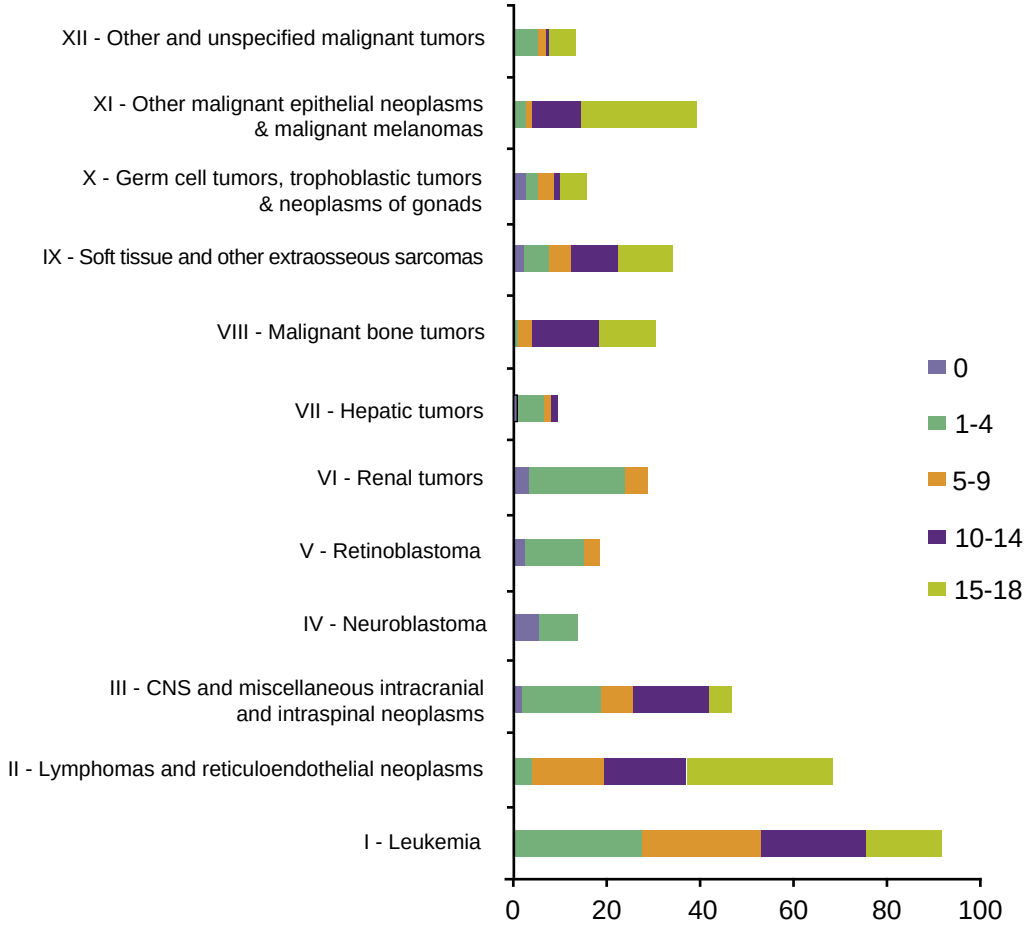

Figure 51. Number of cases by type of childhood cancer, by age-group, Salvador, 1998 to 2002

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

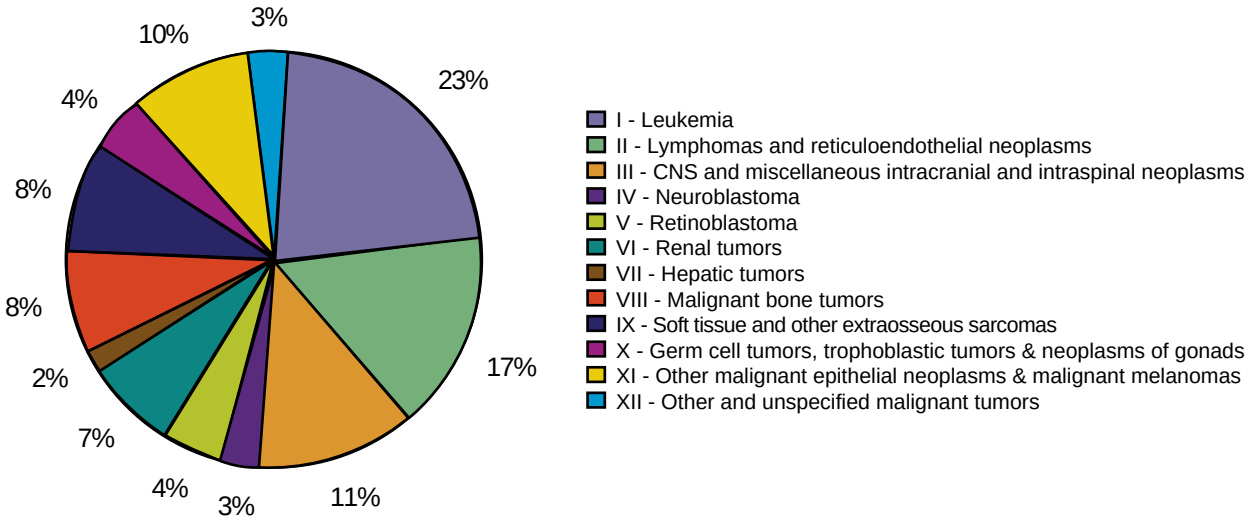

Figure 52. Percentage distribution of incidence by type of childhood cancer, Salvador, 1998 to 2002

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

PBCR of São Paulo/SP

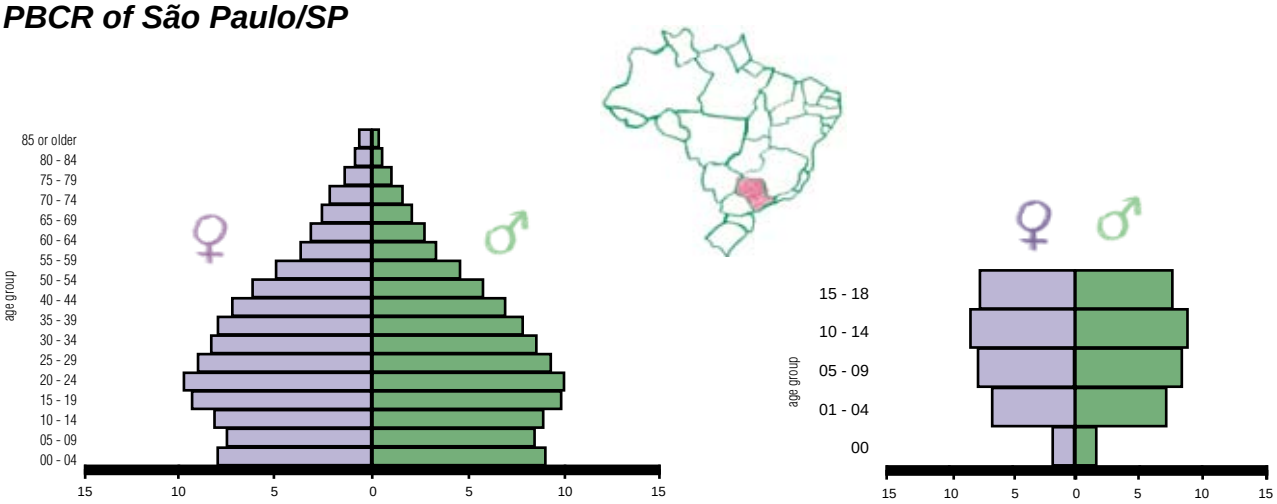

Figure 53. Population Distribution of São Paulo

*Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Coverage area

The PBCR of São Paulo covers the municipality of São Paulo, located in the Southeastern Region of Brazil. São Paulo has an extended area of 1,509 km². The city's population in 2000 (Census) was estimated at 10,434,252 inhabitants. São Paulo lies 860m above sea level and the climate is temperate, with a high and low average annual temperature of 23.5ºC and 15.5º C, respectively.

Health care facilities for cancer prevention and control

Health programs and services are offered by 169 public or private hospitals, disposing 28,158 hospital beds (2.8 per 1000 inhabitants). There are also 12 health units with cancer prevention and early detection programs. Other units for cancer diagnosis and treatment include nine radiotherapy services, five chemotherapy services, and 87 anatomical pathology and cytology laboratories. There are four universities offering medical programs.

Infrastructure and data source

The PBCR was created in 1969 and data collection began in the same year. It is located in the Department of Epidemiology, Faculdade de Saúde Pública, at São Paulo University (USP). The PBCR depends on fixed financial support. The registry staff includes a coordinator, two supervisors – five registrars/collectors, one typist, and one system analyst. The advisory board is composed of two epidemiologists, three health statisticians, and two pathologists. Active data collection occurs in 338 notifying sources: 123 general hospitals, 42 specialized hospitals, four cancer hospitals, 29 general clinics, 12 cancer prevention clinics, 14 radiotherapy and chemotherapy services, four oncology services, 17 homes, one drug control center, 87 anatomical pathology and cytology laboratories, and three autopsy services. The death certificates are obtained from the SEADE Foundation and the Mortality Information Improvement Program in São Paulo (PROAIM).

Use of Information

In addition to determining the incidence and geographic distribution of cancer in São Paulo, the information has been used for studying temporal trends, accessing tracking programs, data supply for epidemiological studies, and for administering classes and lectures.

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Table 57. Population at risk by sex and age-group from 1998 to 2002

Period: 1998 - 2002	Age-group	Male	Female
	< 1	436,190	421,874
	1-4	1,729,927	1,675,320
	5-9	2,124,090	2,071,175
	10-14	2,275,740	2,266,213
	15-18	1,915,111	1,996,033
Total	0 to 18	8,481,058	8,430,615
Annual Average	0 to 18	1,696,212	1,686,123

Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Table 58. Absolute incidence by type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of São Paulo, 1998 to 2002*

Pediatric Tumors - Groups	Number of cases						Rates per million						
	0	1-4	5-9	10-14	15-18	0-18	0	1-4	5-9	10-14	15-18	Crude	Adjusted*
I.Leukemia	**33**	**243**	**185**	**183**	**149**	**793**	**38.46**	**71.36**	**44.10**	**40.29**	**38.10**	**46.89**	**48.57**
Ia.Lymphoid leukemia	16	170	131	119	71	507	18.65	49.92	31.23	26.20	18.15	29.98	31.49
Ib.Acute myeloid leukemia	7	42	26	44	54	173	8.16	12.33	6.20	9.69	13.81	10.23	10.12
Ic.Chronic myeloproliferative diseases	1	5	2	5	5	18	1.17	1.47	0.48	1.10	1.28	1.06	1.07
Id.Myelodysplastic syndrome and other myeloproliferative diseases	3	5	6	0	2	16	3.50	1.47	1.43	0.00	0.51	0.95	1.06
Ie.Unspecified and other specified leukemias	6	21	20	15	17	79	6.99	6.17	4.77	3.30	4.35	4.67	4.83
II.Lymphomas and reticuloendothelial neoplasms	**3**	**75**	**127**	**126**	**184**	**515**	**3.50**	**22.02**	**30.27**	**27.74**	**47.05**	**30.45**	**29.08**
IIa.Hodgkin lymphomas	0	9	48	55	104	216	0.00	2.64	11.44	12.11	26.59	12.77	11.52
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	1	31	52	46	59	189	1.17	9.10	12.39	10.13	15.09	11.18	10.84
IIc.Burkitt lymphoma	0	20	12	12	9	53	0.00	5.87	2.86	2.64	2.30	3.13	3.28
IId.Miscellaneous lymphoreticular neoplasms	0	6	7	7	0	20	0.00	1.76	1.67	1.54	0.00	1.18	1.24
IIe.Unspecified lymphomas	2	9	8	6	12	37	2.33	2.64	1.91	1.32	3.07	2.19	2.20
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**24**	**124**	**132**	**109**	**104**	**493**	**27.97**	**36.41**	**31.46**	**24.00**	**26.59**	**29.15**	**29.81**
IIIa.Ependymomas and choroid plexus tumor	2	16	12	10	10	50	2.33	4.70	2.86	2.20	2.56	2.96	3.08
IIIb.Astrocytomas	4	15	33	34	31	117	4.66	4.40	7.87	7.49	7.93	6.92	6.72
IIIc.Intracranial and intraspinal embryonal tumors	4	25	33	28	17	107	4.66	7.34	7.87	6.16	4.35	6.33	6.47
IIId.Other gliomas	1	7	4	9	6	27	1.17	2.06	0.95	1.98	1.53	1.60	1.60
IIIe.Other specified intracranial and intraspinal neoplasms	0	1	1	2	3	7	0.00	0.29	0.24	0.44	0.77	0.41	0.38
IIIf.Unspecified intracranial and intraspinal neoplasms	13	60	49	26	37	185	15.15	17.62	11.68	5.72	9.46	10.94	11.57
IV.Neuroblastoma and other peripheral nervous cell tumors	**19**	**69**	**16**	**6**	**4**	**114**	**22.14**	**20.26**	**3.81**	**1.32**	**1.02**	**6.74**	**7.99**
IVa.Neuroblastoma and ganglioneuroblastoma	19	67	16	5	1	108	22.14	19.68	3.81	1.10	0.26	6.39	7.64
IVb.Other peripheral nervous cell tumors	0	2	0	1	3	6	0.00	0.59	0.00	0.22	0.77	0.35	0.34
V.Retinoblastoma	**21**	**71**	**7**	**3**	**0**	**102**	**24.47**	**20.85**	**1.67**	**0.66**	**0.00**	**6.03**	**7.37**
VI.Renal tumors	**14**	**64**	**41**	**17**	**9**	**145**	**16.32**	**18.79**	**9.77**	**3.74**	**2.30**	**8.57**	**9.62**
VIa.Nephroblastoma and other nonepithelial renal tumors	9	56	29	6	4	104	10.49	16.45	6.91	1.32	1.02	6.15	7.11
VIb.Renal carcinomas	1	1	5	6	5	18	1.17	0.29	1.19	1.32	1.28	1.06	1.01
VIc.Unspecified malignant renal tumors	4	7	7	5	0	23	4.66	2.06	1.67	1.10	0.00	1.36	1.51
VII.Hepatic tumors	**3**	**5**	**3**	**5**	**4**	**20**	**3.50**	**1.47**	**0.72**	**1.10**	**1.02**	**1.18**	**1.23**
VIIa.Hepatoblastoma	3	5	1	0	1	10	3.50	1.47	0.24	0.00	0.26	0.59	0.70
VIIb.Hepatic carcinomas	0	0	2	5	3	10	0.00	0.00	0.48	1.10	0.77	0.59	0.53
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIII.Malignant bone tumors	**2**	**20**	**55**	**109**	**158**	**344**	**2.33**	**5.87**	**13.11**	**24.00**	**40.40**	**20.34**	**18.32**
VIIIa.Osteosarcomas	0	3	23	58	91	175	0.00	0.88	5.48	12.77	23.27	10.35	9.05
VIIIb.Chondrosarcomas	0	0	0	4	11	15	0.00	0.00	0.00	0.88	2.81	0.89	0.74
VIIIc.Ewing tumor and related sarcomas of bone	0	3	15	26	25	69	0.00	0.88	3.58	5.72	6.39	4.08	3.71
VIIId.Other specified malignant bone tumors	0	1	0	5	4	10	0.00	0.29	0.00	1.10	1.02	0.59	0.53
VIIIe.Unspecified malignant bone tumors	2	13	17	16	27	75	2.33	3.82	4.05	3.52	6.90	4.43	4.30
IX.Soft tissue and other extraosseous sarcomas	**14**	**40**	**46**	**51**	**65**	**216**	**16.32**	**11.75**	**10.96**	**11.23**	**16.62**	**12.77**	**12.63**
IXa.Rhabdomyosarcomas	5	26	25	10	19	85	5.83	7.64	5.96	2.20	4.86	5.03	5.28
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	5	6	8	13	14	46	5.83	1.76	1.91	2.86	3.58	2.72	2.66
IXc.Kaposi sarcoma	0	0	1	2	3	6	0.00	0.00	0.24	0.44	0.77	0.35	0.31
IXd.Other specified soft tissue sarcomas	3	4	6	11	17	41	3.50	1.17	1.43	2.42	4.35	2.42	2.28
IXe.Unspecified soft tissue sarcomas	1	4	6	15	12	38	1.17	1.17	1.43	3.30	3.07	2.25	2.10
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**9**	**11**	**20**	**39**	**60**	**139**	**10.49**	**3.23**	**4.77**	**8.59**	**15.34**	**8.22**	**7.63**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	3	3	0.00	0.00	0.00	0.00	0.77	0.18	0.14
Xb.Malignant extracranial and extragonadal germ cell tumors	5	0	1	0	0	6	5.83	0.00	0.24	0.00	0.00	0.35	0.43
Xc.Malignant gonadal germ cell tumors	4	9	5	20	37	75	4.66	2.64	1.19	4.40	9.46	4.43	4.09
Xd.Gonadal carcinomas	0	0	0	3	2	5	0.00	0.00	0.00	0.66	0.51	0.30	0.25
Xe.Other and unspecified malignant gonadal tumors	0	2	14	16	18	50	0.00	0.59	3.34	3.52	4.60	2.96	2.72
XI.Other malignant epithelial neoplasms & malignant melanomas	**1**	**10**	**17**	**62**	**215**	**305**	**1.17**	**2.94**	**4.05**	**13.65**	**54.97**	**18.03**	**15.45**
XIa.Adrenocortical carcinomas	1	3	0	0	1	5	1.17	0.88	0.00	0.00	0.26	0.30	0.34
XIb.Thyroid carcinomas	0	0	2	1	70	73	0.00	0.00	0.48	0.22	17.90	4.32	3.55
XIc.Nasopharyngeal carcinomas	0	0	1	10	14	25	0.00	0.00	0.24	2.20	3.58	1.48	1.26
XId.Malignant melanomas	0	1	1	7	17	26	0.00	0.29	0.24	1.54	4.35	1.54	1.32
XIe.Skin carcinomas	0	0	1	14	28	43	0.00	0.00	0.24	3.08	7.16	2.54	2.14
XIf.Other and unspecified carcinomas	0	6	12	30	85	133	0.00	1.76	2.86	6.61	21.73	7.86	6.84
XII.Other and unspecified malignant neoplasms	**19**	**56**	**39**	**23**	**72**	**209**	**22.14**	**16.45**	**9.30**	**5.06**	**18.41**	**12.36**	**12.62**
XIIa.Other specified malignant tumors	0	0	1	0	0	1	0.00	0.00	0.24	0.00	0.00	0.06	0.06
XIIb.Other and unspecified malignant tumors	19	56	38	23	72	208	22.14	16.45	9.06	5.06	18.41	12.30	12.56
All Neoplasms	**162**	**788**	**688**	**733**	**1024**	**3395**	**188.80**	**231.41**	**163.99**	**161.38**	**261.82**	**200.75**	**200.32**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

Table 59. Absolute incidence by sex and type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of São Paulo, 1998 to 2002*

Pediatric Tumors - Groups	Male								Female							
	Number of cases						Rates per million		Number of cases						Rates per million	
	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*
I.Leukemia	**20**	**144**	**106**	**99**	**99**	**468**	**55.18**	**56.86**	**13**	**99**	**79**	**84**	**50**	**325**	**38.55**	**40.23**
Ia.Lymphoid leukemia	9	97	69	73	50	298	35.14	36.37	7	73	62	46	21	209	24.79	26.59
Ib.Acute myeloid leukemia	5	27	18	18	28	96	11.32	11.48	2	15	8	26	26	77	9.13	8.72
Ic.Chronic myeloproliferative diseases	0	4	1	1	4	10	1.18	1.20	1	1	1	4	1	8	0.95	0.94
Id.Myelodysplastic syndrome and other myeloproliferative diseases	1	3	4	0	1	9	1.06	1.17	2	2	2	0	1	7	0.83	0.95
Ie.Unspecified and other specified leukemias	5	13	14	7	16	55	6.49	6.63	1	8	6	8	1	24	2.85	3.03
II.Lymphomas and reticuloendothelial neoplasms	**1**	**46**	**94**	**85**	**107**	**333**	**39.26**	**37.74**	**2**	**29**	**33**	**41**	**77**	**182**	**21.59**	**20.35**
IIa.Hodgkin lymphomas	0	7	35	37	53	132	15.56	14.38	0	2	13	18	51	84	9.96	8.63
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	14	37	32	40	123	14.50	13.84	1	17	15	14	19	66	7.83	7.84
IIc.Burkitt lymphoma	0	15	10	8	7	40	4.72	4.93	0	5	2	4	2	13	1.54	1.61
IId.Miscellaneous lymphoreticular neoplasms	0	4	6	3	0	13	1.53	1.63	0	2	1	4	0	7	0.83	0.84
IIe.Unspecified lymphomas	1	6	6	5	7	25	2.95	2.96	1	3	2	1	5	12	1.42	1.43
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**10**	**65**	**72**	**54**	**57**	**258**	**30.42**	**30.96**	**14**	**59**	**60**	**55**	**47**	**235**	**27.87**	**28.67**
IIIa.Ependymomas and choroid plexus tumor	1	9	5	5	8	28	3.30	3.37	1	7	7	5	2	22	2.61	2.79
IIIb.Astrocytomas	0	6	14	16	13	49	5.78	5.53	4	9	19	18	18	68	8.07	7.92
IIIc.Intracranial and intraspinal embryonal tumors	3	14	24	13	14	68	8.02	8.15	1	11	9	15	3	39	4.63	4.78
IIId.Other gliomas	1	5	2	4	4	16	1.89	1.92	0	2	2	5	2	11	1.30	1.26
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	1	1	2	4	0.47	0.42	0	1	0	1	1	3	0.36	0.35
IIIf.Unspecified intracranial and intraspinal neoplasms	5	31	26	15	16	93	10.97	11.56	8	29	23	11	21	92	10.91	11.58
IV.Neuroblastoma and other peripheral nervous cell tumors	**8**	**30**	**11**	**3**	**2**	**54**	**6.37**	**7.37**	**11**	**39**	**5**	**3**	**2**	**60**	**7.12**	**8.62**
IVa.Neuroblastoma and ganglioneuroblastoma	8	29	11	3	0	51	6.01	7.03	11	38	5	2	1	57	6.76	8.27
IVb.Other peripheral nervous cell tumors	0	1	0	0	2	3	0.35	0.34	0	1	0	1	1	3	0.36	0.35
V.Retinoblastoma	**11**	**39**	**5**	**3**	**0**	**58**	**6.84**	**8.18**	**10**	**32**	**2**	**0**	**0**	**44**	**5.22**	**6.54**
VI.Renal tumors	**8**	**21**	**21**	**10**	**3**	**63**	**7.43**	**8.12**	**6**	**43**	**20**	**7**	**6**	**82**	**9.73**	**11.17**
VIa.Nephroblastoma and other nonepithelial renal tumors	6	19	13	3	1	42	4.95	5.64	3	37	16	3	3	62	7.35	8.61
VIb.Renal carcinomas	0	0	3	4	2	9	1.06	0.98	1	1	2	2	3	9	1.07	1.04
VIc.Unspecified malignant renal tumors	2	2	5	3	0	12	1.41	1.51	2	5	2	2	0	11	1.30	1.51
VII.Hepatic tumors	**3**	**3**	**2**	**3**	**1**	**12**	**1.41**	**1.52**	**0**	**2**	**1**	**2**	**3**	**8**	**0.95**	**0.92**
VIIa.Hepatoblastoma	3	3	1	0	0	7	0.83	0.99	0	2	0	0	1	3	0.36	0.39
VIIb.Hepatic carcinomas	0	0	1	3	1	5	0.59	0.53	0	0	1	2	2	5	0.59	0.52
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIII.Malignant bone tumors	**1**	**11**	**30**	**53**	**103**	**198**	**23.35**	**21.06**	**1**	**9**	**25**	**56**	**55**	**146**	**17.32**	**15.67**
VIIIa.Osteosarcomas	0	1	11	26	64	102	12.03	10.49	0	2	12	32	27	73	8.66	7.69
VIIIb.Chondrosarcomas	0	0	0	3	6	9	1.06	0.90	0	0	0	1	5	6	0.71	0.58
VIIIc.Ewing tumor and related sarcomas of bone	0	2	10	13	14	39	4.60	4.25	0	1	5	13	11	30	3.56	3.17
VIIId.Other specified malignant bone tumors	0	1	0	3	2	6	0.71	0.65	0	0	0	2	2	4	0.47	0.40
VIIIe.Unspecified malignant bone tumors	1	7	9	8	17	42	4.95	4.77	1	6	8	8	10	33	3.91	3.84
IX.Soft tissue and other extraosseous sarcomas	**5**	**24**	**23**	**30**	**36**	**118**	**13.91**	**13.69**	**9**	**16**	**23**	**21**	**29**	**98**	**11.62**	**11.57**
IXa.Rhabdomyosarcomas	2	15	14	8	10	49	5.78	6.00	3	11	11	2	9	36	4.27	4.54
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	1	5	3	6	4	19	2.24	2.25	4	1	5	7	10	27	3.20	3.05
IXc.Kaposi sarcoma	0	0	1	1	2	4	0.47	0.42	0	0	0	1	1	2	0.24	0.20
IXd.Other specified soft tissue sarcomas	1	2	3	6	11	23	2.71	2.51	2	2	3	5	6	18	2.14	2.06
IXe.Unspecified soft tissue sarcomas	1	2	2	9	9	23	2.71	2.50	0	2	4	6	3	15	1.78	1.71
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**3**	**4**	**17**	**20**	**36**	**80**	**9.43**	**8.72**	**6**	**7**	**3**	**19**	**24**	**59**	**7.00**	**6.56**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	3	3	0.35	0.30	0	0	0	0	0	0	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	0	0	1	0	0	1	0.12	0.12	5	0	0	0	0	5	0.59	0.74
Xc.Malignant gonadal germ cell tumors	3	4	2	8	22	39	4.60	4.25	1	5	3	12	15	36	4.27	3.94
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	3	2	5	0.59	0.50
Xe.Other and unspecified malignant gonadal tumors	0	0	14	12	11	37	4.36	4.05	0	2	0	4	7	13	1.54	1.38
XI.Other malignant epithelial neoplasms & malignant melanomas	**0**	**6**	**11**	**23**	**66**	**106**	**12.50**	**11.10**	**1**	**4**	**6**	**39**	**149**	**199**	**23.60**	**19.63**
XIa.Adrenocortical carcinomas	0	3	0	0	0	3	0.35	0.44	1	0	0	0	1	2	0.24	0.24
XIb.Thyroid carcinomas	0	0	1	0	11	12	1.41	1.21	0	0	1	1	59	61	7.24	5.80
XIc.Nasopharyngeal carcinomas	0	0	1	5	9	15	1.77	1.53	0	0	0	5	5	10	1.19	0.99
XId.Malignant melanomas	0	0	1	4	10	15	1.77	1.52	0	1	0	3	7	11	1.30	1.12
XIe.Skin carcinomas	0	0	0	6	9	15	1.77	1.51	0	0	1	8	19	28	3.32	2.75
XIf.Other and unspecified carcinomas	0	3	8	8	27	46	5.42	4.91	0	3	4	22	58	87	10.32	8.72
XII.Other and unspecified malignant neoplasms	**11**	**29**	**15**	**11**	**35**	**101**	**11.91**	**12.23**	**8**	**27**	**24**	**12**	**37**	**108**	**12.81**	**13.02**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0	0	1	0	0	1	0.12	0.13
XIIb.Other and unspecified malignant tumors	11	29	15	11	35	101	11.91	12.23	8	27	23	12	37	107	12.69	12.89
All Neoplasms	**81**	**422**	**407**	**394**	**545**	**1849**	**218.02**	**217.56**	**81**	**366**	**281**	**339**	**479**	**1546**	**183.38**	**182.96**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
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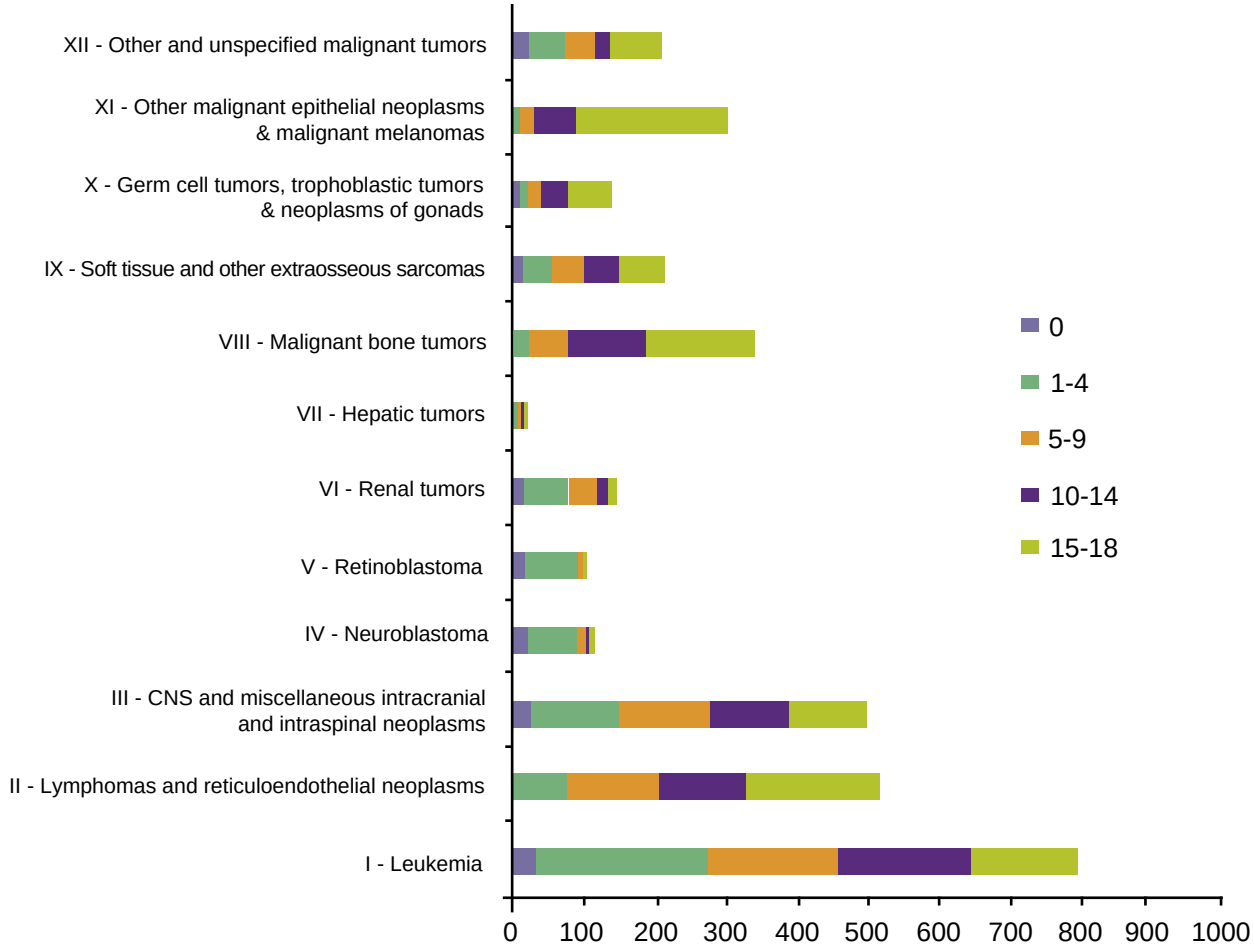

Figure 54. Number of cases by type of childhood cancer, by age-group, São Paulo, 1998 to 2002

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

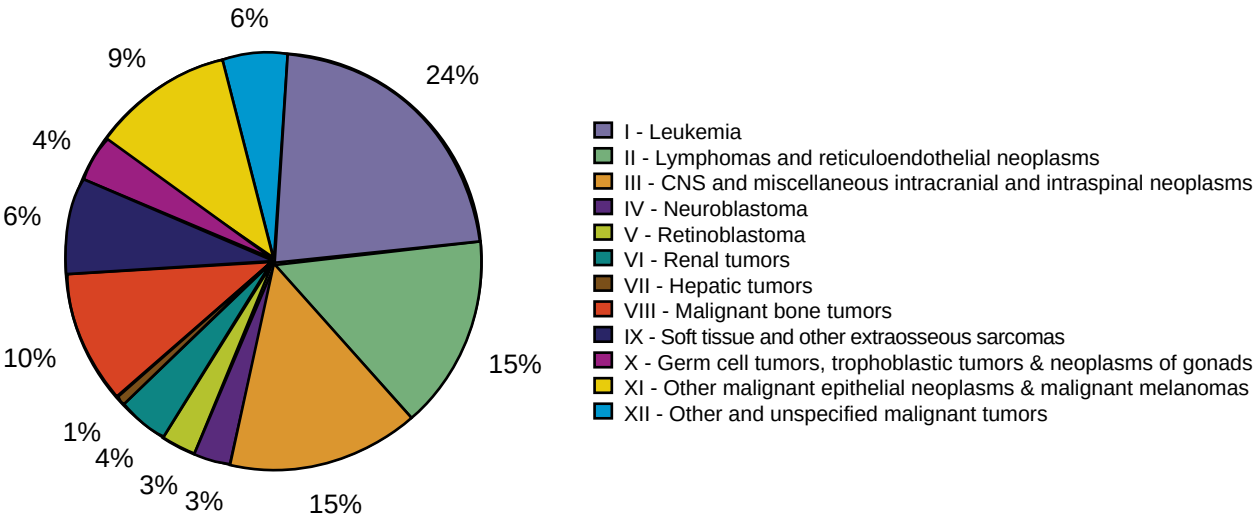

Figure 55. Percentage distribution of incidence by type of childhood cancer, São Paulo, 1998 to 2002

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

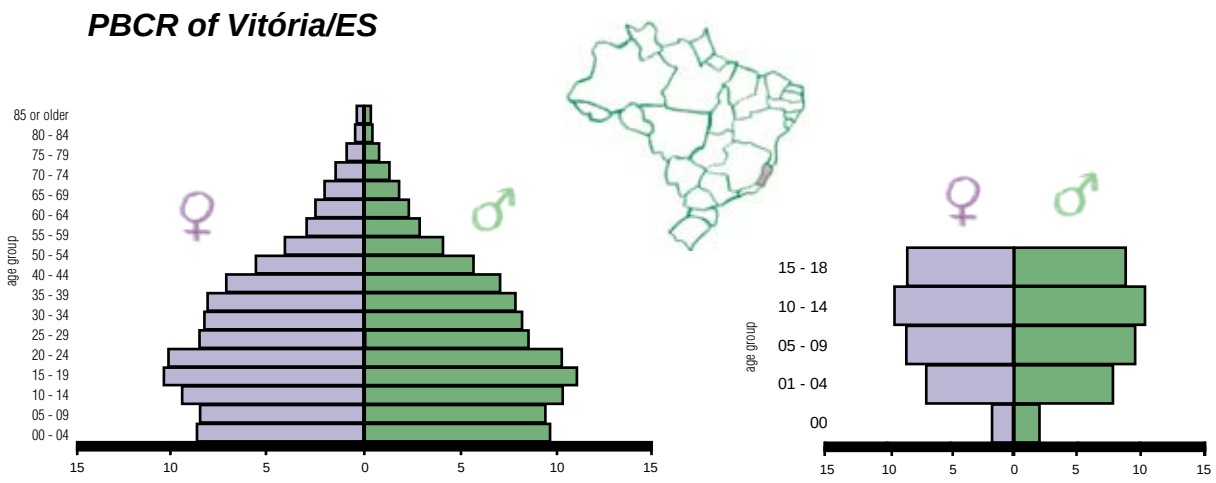

Figure 56. Population Distribution of Grande Vitória

*Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Coverage area

The PBCR of Vitória covers the metropolitan region called Grande Vitória, which includes the following municipalities: Vitória, Cariacica, Serra, Vila Velha, Viana, and Guarapari. The population amounts to 1,425,587 inhabitants, according to the 2000 Census. They represent 46.03% of the total state population and 56.91% of the urban population, with an annual growth rate of 2.0%. The above-mentioned municipalities are part of the state of Espirito Santo, situated in the Southeastern Region of Brazil. Grande Vitória extends 2,043.22 Km² and lies 5 to 65m above sea level. The climate is seaside tropical.

Health care facilities for cancer prevention and control

Health services and programs are offered by five public hospitals, which furnish 101 hospital beds (approximately 3.11 hospital beds per 100,000 inhabitants). There are 996 health units with cancer prevention and early detection programs, such as health stations, health centers, policlinics, and family health units (according to data from 2003). Other units for cancer diagnosis and treatment include three radiotherapy services, six chemotherapy services, and six anatomical pathology laboratories. There are five universities and five colleges that offer medical programs.

Infrastructure and data source

The PBCR was created in 1998. It is located in the State Department of Health, Health Surveillance Management (Gerência de Vigilância em Saúde - GEVS), at the Nucleus of Epidemiological Vigilance (NEVE), under the coordination of the Cancer Surveillance and Epidemiology Program. It relies on the financial support of the National Cancer Institute by means of the partnership INCA/SESA. The registry staff includes one coordinator, one typist, one registrars/collector. The advisory board is composed of four sanitary medical doctors, one statistician, one medical pathologist, five oncologists. Active data collection occurs in 11 notifying sources: one specialized hospital, two university hospitals, two general hospitals, two anatomical pathology laboratories, two oncology clinics, APAC / SESA and SIM.

Use of Information

In addition to determining the incidence and geographic distribution of cancer in Grande Vitoria, the information has been used for studying access to tracking programs, data supply for epidemiological studies, and for administering classes and lectures. In the future, it will be used to study temporal trends.

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Table 60. Population at risk by sex and age-group for 1997

Period: 1997	Age-group	Male	Female
	< 1	11,973	11,440
	1-4	48,073	46,656
	5-9	65,801	63,006
	10-14	71,287	70,545
	15-18	56,446	58,130
Total	0 to 18	253,580	249,777
Annual Average	0 to 18	253,580	249,777

Demographic Census of 2000 - IBGE
Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística – IBGE

Table 61. Absolute incidence by type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Vitória, 1997*

Pediatric Tumors - Groups	Number of cases						Rates per million						
	0	1-4	5-9	10-14	15-18	0-18	0	1-4	5-9	10-14	15-18	Crude	Adjusted*
I.Leukemia	**1**	**4**	**3**	**4**	**3**	**15**	**42.71**	**42.23**	**23.29**	**28.20**	**26.18**	**29.80**	**30.97**
Ia.Lymphoid leukemia	1	4	1	2	1	9	42.71	42.23	7.76	14.10	8.73	17.88	20.29
Ib.Acute myeloid leukemia	0	0	0	1	1	2	0.00	0.00	0.00	7.05	8.73	3.97	3.31
Ic.Chronic myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ie.Unspecified and other specified leukemias	0	0	2	1	1	4	0.00	0.00	15.53	7.05	8.73	7.95	7.37
II.Lymphomas and reticuloendothelial neoplasms	**0**	**0**	**3**	**0**	**4**	**7**	**0.00**	**0.00**	**23.29**	**0.00**	**34.91**	**13.91**	**12.68**
IIa.Hodgkin lymphomas	0	0	2	0	1	3	0.00	0.00	15.53	0.00	8.73	5.96	5.71
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	0	1	0	2	3	0.00	0.00	7.76	0.00	17.46	5.96	5.32
IIc.Burkitt lymphoma	0	0	0	0	1	1	0.00	0.00	0.00	0.00	8.73	1.99	1.65
IId.Miscellaneous lymphoreticular neoplasms	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIe.Unspecified lymphomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**0**	**3**	**0**	**0**	**1**	**4**	**0.00**	**31.67**	**0.00**	**0.00**	**8.73**	**7.95**	**9.60**
IIIa.Ependymomas and choroid plexus tumor	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIb.Astrocytomas	0	1	0	0	0	1	0.00	10.56	0.00	0.00	0.00	1.99	2.65
IIIc.Intracranial and intraspinal embryonal tumors	0	1	0	0	1	2	0.00	10.56	0.00	0.00	8.73	3.97	4.30
IIId.Other gliomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	0	1	0	0	0	1	0.00	10.56	0.00	0.00	0.00	1.99	2.65
IV.Neuroblastoma and other peripheral nervous cell tumors	**0**	**0**	**0**	**1**	**0**	**1**	**0.00**	**0.00**	**0.00**	**7.05**	**0.00**	**1.99**	**1.66**
IVa.Neuroblastoma and ganglioneuroblastoma	0	0	0	1	0	1	0.00	0.00	0.00	7.05	0.00	1.99	1.66
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
V.Retinoblastoma	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
VI.Renal tumors	**0**	**1**	**0**	**0**	**0**	**1**	**0.00**	**10.56**	**0.00**	**0.00**	**0.00**	**1.99**	**2.65**
VIa.Nephroblastoma and other nonepithelial renal tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIc.Unspecified malignant renal tumors	0	1	0	0	0	1	0.00	10.56	0.00	0.00	0.00	1.99	2.65
VII.Hepatic tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
VIIa.Hepatoblastoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIb.Hepatic carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIII.Malignant bone tumors	**0**	**0**	**0**	**3**	**2**	**5**	**0.00**	**0.00**	**0.00**	**21.15**	**17.46**	**9.93**	**8.27**
VIIIa.Osteosarcomas	0	0	0	2	2	4	0.00	0.00	0.00	14.10	17.46	7.95	6.61
VIIIb.Chondrosarcomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIc.Ewing tumor and related sarcomas of bone	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	0	0	1	0	1	0.00	0.00	0.00	7.05	0.00	1.99	1.66
IX.Soft tissue and other extraosseous sarcomas	**0**	**0**	**0**	**1**	**0**	**1**	**0.00**	**0.00**	**0.00**	**7.05**	**0.00**	**1.99**	**1.66**
IXa.Rhabdomyosarcomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	0	0	1	0	1	0.00	0.00	0.00	7.05	0.00	1.99	1.66
IXe.Unspecified soft tissue sarcomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xc.Malignant gonadal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xe.Other and unspecified malignant gonadal tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XI.Other malignant epithelial neoplasms & malignant melanomas	**0**	**0**	**1**	**0**	**2**	**3**	**0.00**	**0.00**	**7.76**	**0.00**	**17.46**	**5.96**	**5.32**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIb.Thyroid carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIc.Nasopharyngeal carcinomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XId.Malignant melanomas	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIe.Skin carcinomas	0	0	1	0	0	1	0.00	0.00	7.76	0.00	0.00	1.99	2.03
XIf.Other and unspecified carcinomas	0	0	0	0	2	2	0.00	0.00	0.00	0.00	17.46	3.97	3.29
XII.Other and unspecified malignant neoplasms	**0**	**0**	**0**	**1**	**1**	**2**	**0.00**	**0.00**	**0.00**	**7.05**	**8.73**	**3.97**	**3.31**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XIIb.Other and unspecified malignant tumors	0	0	0	1	1	2	0.00	0.00	0.00	7.05	8.73	3.97	3.31
All Neoplasms	**1**	**8**	**7**	**10**	**13**	**39**	**42.71**	**84.45**	**54.34**	**70.51**	**113.46**	**77.48**	**76.13**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
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Table 62. Absolute incidence by sex and type of cancer, crude and age-adjusted rates, per million children and adolescents, PBCR of Vitória, 1997*

Pediatric Tumors - Groups	Male								Female							
	Number of cases						Rates per million		Number of cases						Rates per million	
	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*	0	1-4	5-9	10-14	15-18	0-18	Crude	Adjusted*
I.Leukemia	**1**	**3**	**2**	**3**	**0**	**9**	**35.49**	**38.80**	**0**	**1**	**1**	**1**	**3**	**6**	**24.02**	**22.61**
Ia.Lymphoid leukemia	1	3	1	1	0	6	23.66	28.21	0	1	0	1	1	3	12.01	11.97
Ib.Acute myeloid leukemia	0	0	0	1	0	1	3.94	3.30	0	0	0	0	1	1	4.00	3.24
Ic.Chronic myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Id.Myelodysplastic syndrome and other myeloproliferative diseases	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Ie.Unspecified and other specified leukemias	0	0	1	1	0	2	7.89	7.28	0	0	1	0	1	2	8.01	7.40
II.Lymphomas and reticuloendothelial neoplasms	**0**	**0**	**3**	**0**	**2**	**5**	**19.72**	**18.61**	**0**	**0**	**0**	**0**	**2**	**2**	**8.01**	**6.48**
IIa.Hodgkin lymphomas	0	0	2	0	0	2	7.89	7.96	0	0	0	0	1	1	4.00	3.24
IIb.Non-Hodgkin lymphomas (except Burkitt lymphoma)	0	0	1	0	1	2	7.89	7.32	0	0	0	0	1	1	4.00	3.24
IIc.Burkitt lymphoma	0	0	0	0	1	1	3.94	3.34	0	0	0	0	0	0	0.00	0.00
IId.Miscellaneous lymphoreticular neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIe.Unspecified lymphomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
III.CNS and miscellaneous intracranial and intraspinal neoplasms	**0**	**2**	**0**	**0**	**1**	**3**	**11.83**	**13.79**	**0**	**1**	**0**	**0**	**0**	**1**	**4.00**	**5.39**
IIIa.Ependymomas and choroid plexus tumor	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIb.Astrocytomas	0	1	0	0	0	1	3.94	5.23	0	0	0	0	0	0	0.00	0.00
IIIc.Intracranial and intraspinal embryonal tumors	0	0	0	0	1	1	3.94	3.34	0	1	0	0	0	1	4.00	5.39
IIId.Other gliomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIe.Other specified intracranial and intraspinal neoplasms	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IIIf.Unspecified intracranial and intraspinal neoplasms	0	1	0	0	0	1	3.94	5.23	0	0	0	0	0	0	0.00	0.00
IV.Neuroblastoma and other peripheral nervous cell tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**1**	**0**	**1**	**4.00**	**3.34**
IVa.Neuroblastoma and ganglioneuroblastoma	0	0	0	0	0	0	0.00	0.00	0	0	0	1	0	1	4.00	3.34
IVb.Other peripheral nervous cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
V.Retinoblastoma	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
VI.Renal tumors	**0**	**1**	**0**	**0**	**0**	**1**	**3.94**	**5.23**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
VIa.Nephroblastoma and other nonepithelial renal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIb.Renal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIc.Unspecified malignant renal tumors	0	1	0	0	0	1	3.94	5.23	0	0	0	0	0	0	0.00	0.00
VII.Hepatic tumors	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
VIIa.Hepatoblastoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIb.Hepatic carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIc.Unspecified malignant hepatic tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIII.Malignant bone tumors	**0**	**0**	**0**	**1**	**0**	**1**	**3.94**	**3.30**	**0**	**0**	**0**	**2**	**2**	**4**	**16.01**	**13.16**
VIIIa.Osteosarcomas	0	0	0	1	0	1	3.94	3.30	0	0	0	1	2	3	12.01	9.82
VIIIb.Chondrosarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIc.Ewing tumor and related sarcomas of bone	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIId.Other specified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
VIIIe.Unspecified malignant bone tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	1	0	1	4.00	3.34
IX.Soft tissue and other extraosseous sarcomas	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**1**	**0**	**1**	**4.00**	**3.34**
IXa.Rhabdomyosarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXb.Fibrosarc., periph. nerve sheath tumors, other fibrous neopl.	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXc.Kaposi sarcoma	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
IXd.Other specified soft tissue sarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	1	0	1	4.00	3.34
IXe.Unspecified soft tissue sarcomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
X.Germ cell tumors, trophoblastic tumors & neoplasms of gonads	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
Xa.Intracranial and intraspinal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xb.Malignant extracranial and extragonadal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xc.Malignant gonadal germ cell tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xd.Gonadal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
Xe.Other and unspecified malignant gonadal tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XI.Other malignant epithelial neoplasms & malignant melanomas	**0**	**0**	**1**	**0**	**1**	**2**	**7.89**	**7.32**	**0**	**0**	**0**	**0**	**1**	**1**	**4.00**	**3.24**
XIa.Adrenocortical carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIb.Thyroid carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIc.Nasopharyngeal carcinomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XId.Malignant melanomas	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIe.Skin carcinomas	0	0	1	0	0	1	3.94	3.98	0	0	0	0	0	0	0.00	0.00
XIf.Other and unspecified carcinomas	0	0	0	0	1	1	3.94	3.34	0	0	0	0	1	1	4.00	3.24
XII.Other and unspecified malignant neoplasms	**0**	**0**	**0**	**1**	**1**	**2**	**7.89**	**6.64**	**0**	**0**	**0**	**0**	**0**	**0**	**0.00**	**0.00**
XIIa.Other specified malignant tumors	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	0.00
XIIb.Other and unspecified malignant tumors	0	0	0	1	1	2	7.89	6.64	0	0	0	0	0	0	0.00	0.00
All Neoplasms	**1**	**6**	**6**	**5**	**5**	**23**	**90.70**	**93.70**	**0**	**2**	**1**	**5**	**8**	**16**	**64.06**	**57.57**

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
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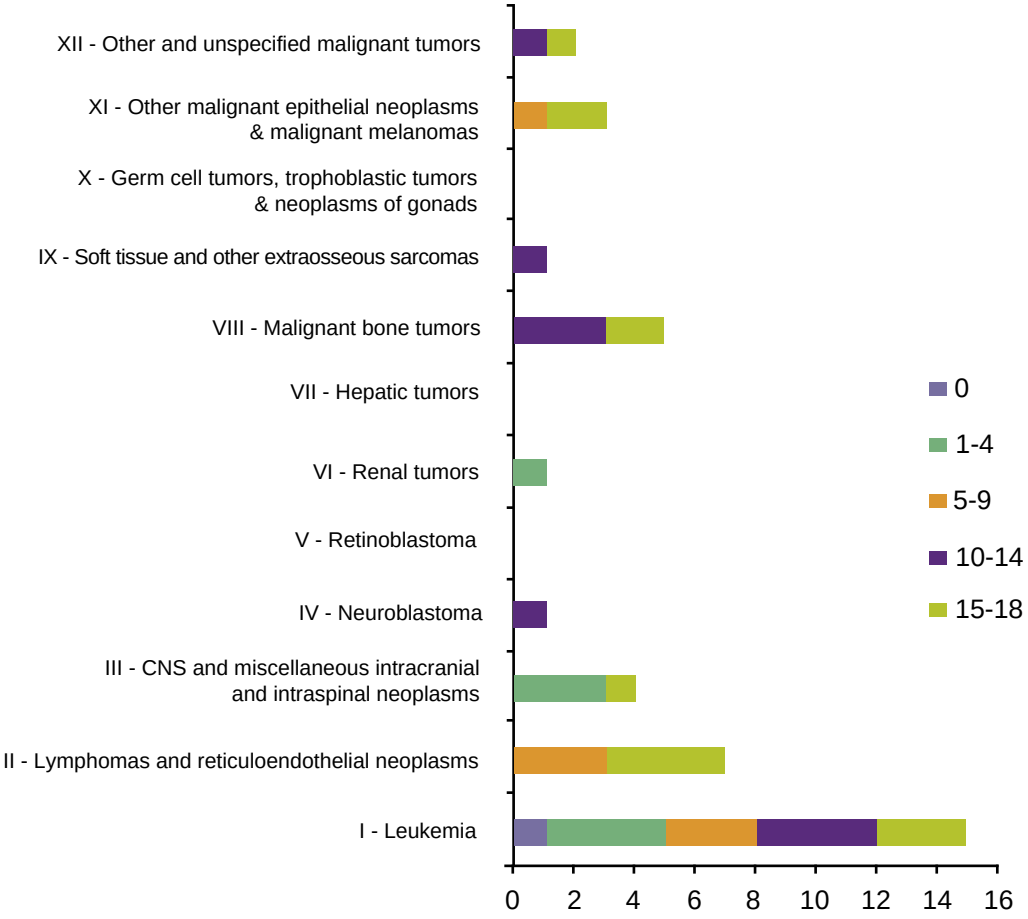

Figure 57. Number of cases by type of childhood cancer, by age-group, Vitória, 1997

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
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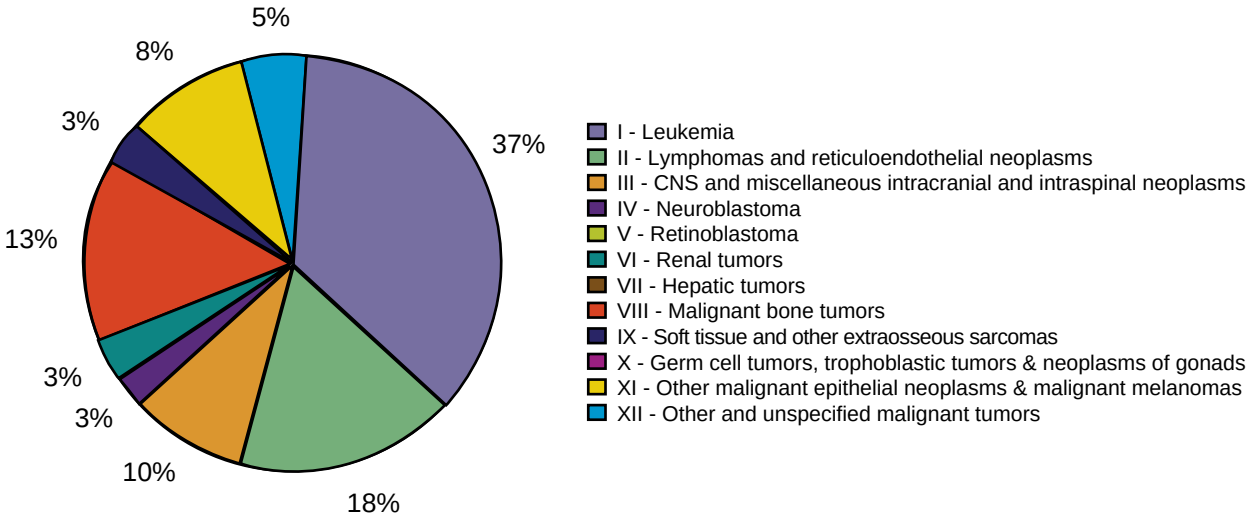

Figure 58. Percentage distribution of incidence by type of childhood cancer, Vitória, 1997

Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

Table 63 presents the average incidence rates of cancer per million children and adolescents (aged 0 to 18), by sex, age group, and time period of each of the 20 Brazilian PBCR. Information from the cancer registries with less than 20 cases is presented in the body of the tables and figures. However, the analysis suppresses these cases since low numbers may lead to unstable rates.

The most recent publication about cancer incidence – "Cancer Incidence in Five Continents – CI5 IX", points out that average age-adjusted incidence rates[c], between 1998 and 2002, vary from 26 (territories in Northeast Canada) to 353 (Kuwait) for males and 36 to 411 for females in the same locations.

In Brazilian PBCR, the average age-adjusted incidence rates[c] vary from 76 to 231. For males, the lowest rates occurred in Belém and highest in Goiânia (average between 80 and 250, respectively). For the female sex, the average incidences vary from 58 to 212, the lowest observed in Grande Vitória and the highest in Goiânia.

In a worldwide context, the most common cancer case in children and adolescents are leukemias. In the European study (Steliarova-Foucher, 2004), leukemias were more frequent in children, followed by CNS tumors and lymphomas. In the United States, leukemias correspond to 26.3% of all infant tumors, followed by CNS tumors (17.6%) and lymphomas (14.6%) (Li, 2008).

We observed a predominance of leukemia in the 20 Brazilian PBCR. Leukemia was the most common tumor, with an median percentage of 29%, varying from 19% in Aracaju to 42.5% in Manaus. It is worth noting that the PBCR located in Brazil's Northern Region presented the highest percentages of leukemia (over 39%). Unlike the patterns observed in developed countries, the second most common tumors in most Brazilian PBCR were lymphomas, except in Aracaju, Campinas and Distrito Federal. The median percentage was 15.5%, varying from 13 to 20%. The CNS tumors ranked third in most of the 20 PBCRs, except in the above-mentioned cities. The median percentage was 13.4%, varying from 7.2% to 17.9%.

The highest incidence of leukemia, displaying an median percentage of 31.6%, occurred in the 1-4 age group. Lymphomas mostly commonly occurred in adolescents aged 15 to 18, with an median incidence of 35.6%. Similarly, CNS tumors presented an median percentage of about 26% among age groups 1-4, 5-9 and 10-14. This information is compatible to results found in medical literature for countries displaying the characteristics of developing countries.

c Rates per million, adjusted for World Standard Population, 1966

Table 63. Specific incidence by type of cancer, crude and age-adjusted rates, per million children and adolescents (ages 0-18), according to PBCR and reference period*

PBCR	Age-group	Sex	Aracaju (1996-2000)	Belém (1997-2001)	Belo Horizonte (2000 - 2001)	Campinas (1991-1995)	Campo Grande (2000-2001)	Cuiabá (2000 - 2003)	Curitiba (1998 - 2002)	Distrito Federal (1999-2002)	Fortaleza (1998-2002)	Goiânia (1999-2003)	João Pessoa (2000-2004)	Jaú (2000 - 2004)	Manaus (1999-2002)	Natal (1998-2001)	Palmas (2000-2003)	Porto Alegre (1998-2002)	Recife (1997-2001)	Salvador (1998-2002)	São Paulo (1998-2002)	Vitória (1997)
Specific Coefficient	0	Total	75.04	68.83	126.20	223.55	300.09	190.60	145.12	77.67	82.02	315.19	93.23	0.00	125.50	116.31	0.00	152.54	129.82	79.15	188.80	42.71
		Male	48.78	49.07	165.42	229.93	337.61	183.78	134.69	66.93	103.54	255.17	110.27	0.00	217.46	113.58	0.00	186.84	120.15	77.28	185.70	83.52
		Female	102.70	89.40	85.60	216.78	261.37	197.94	155.99	88.76	69.30	377.95	75.68	0.00	30.08	119.18	0.00	116.81	139.66	81.12	192.00	0.00
	1-4	Total	191.34	109.51	174.22	180.66	196.25	240.78	268.89	183.98	144.29	274.20	213.50	289.60	209.84	193.37	33.36	251.96	222.07	137.22	231.41	84.45
		Male	176.97	104.18	171.67	182.86	223.22	291.47	277.65	182.21	135.06	333.26	255.24	284.84	246.87	228.40	65.83	288.06	237.03	157.33	243.94	124.81
		Female	205.98	115.06	176.85	178.36	168.29	188.36	255.84	185.82	151.42	213.18	170.20	294.53	168.19	157.20	0.00	214.46	206.57	116.35	218.47	42.87
	5-9	Total	108.97	67.29	119.37	98.66	116.60	116.32	186.57	148.30	104.17	221.14	92.88	132.74	159.40	104.61	15.24	150.64	137.57	69.39	163.99	54.34
		Male	122.11	70.24	146.42	115.57	138.06	131.96	229.65	150.13	106.36	226.59	112.96	176.59	161.13	88.88	29.84	166.79	148.13	83.57	191.61	91.18
		Female	95.60	64.26	91.81	81.20	94.56	100.20	141.85	144.34	100.00	215.53	72.31	88.69	157.63	120.63	0.00	133.86	126.68	54.79	135.67	15.87
	10-14	Total	123.87	51.98	159.76	101.69	165.09	136.62	113.68	138.66	105.90	157.03	88.12	100.97	118.03	148.90	31.22	169.88	162.65	81.66	161.38	70.51
		Male	150.17	61.26	218.99	118.33	147.43	148.17	100.22	158.07	104.03	172.26	91.20	79.61	121.05	184.55	63.64	193.16	169.14	81.65	173.13	70.14
		Female	98.10	43.06	94.72	84.53	183.40	124.84	127.37	117.38	107.74	141.72	85.02	122.96	115.08	113.93	0.00	145.73	153.15	81.67	149.59	70.88
	15-18	Total	123.66	80.34	180.75	107.79	204.68	184.35	196.93	127.46	177.29	251.40	167.13	133.19	141.12	136.84	0.00	218.14	153.26	98.43	261.82	113.46
		Male	140.06	95.95	221.43	127.30	197.31	163.39	216.92	142.99	161.11	264.94	221.85	88.33	172.46	100.81	0.00	258.11	147.31	102.80	284.58	88.58
		Female	108.79	66.35	141.29	88.42	211.93	204.79	177.37	113.32	189.88	238.78	115.50	178.53	112.19	169.98	0.00	178.04	158.99	94.35	239.98	137.62
Rates per million	Crude	Total	130.19	74.75	156.19	124.13	173.94	165.19	183.79	144.52	128.16	226.44	132.48	147.40	154.21	142.05	19.02	191.77	163.93	93.37	200.75	77.48
		Male	140.88	79.59	189.52	138.13	180.08	177.07	197.18	152.82	123.31	243.74	159.92	140.68	175.96	146.66	38.53	220.16	169.61	101.63	218.02	90.70
		Female	119.71	70.01	121.23	109.74	167.68	153.10	169.38	135.29	132.01	209.15	105.00	154.24	131.90	137.49	0.00	162.53	157.38	85.13	183.38	64.06
	Adjusted*	Total	133.82	76.85	154.67	129.55	176.17	169.87	189.43	146.63	127.05	230.98	136.09	156.42	156.76	144.16	19.73	193.48	167.18	95.42	200.32	76.13
		Male	141.29	80.17	185.20	142.53	185.38	185.04	202.85	153.49	123.16	249.62	163.95	153.22	178.91	150.28	39.35	221.95	173.51	104.89	217.56	93.70
		Female	126.86	74.01	122.80	116.28	166.62	154.01	174.67	139.07	129.76	212.14	108.26	159.86	133.68	137.45	0.00	164.17	159.90	85.70	182.96	57.57

*World Standard Population, modified by Doll et al. (1966)

Sources: Data from Population-Based Cancer Registries
MS/INCA/Conprev/Divisão de Informação

The following describe the distribution of average age-adjusted incidence rates, by type of cancer, according to the International Classification of Childhood Cancer (Chart 2) in various PBCR.

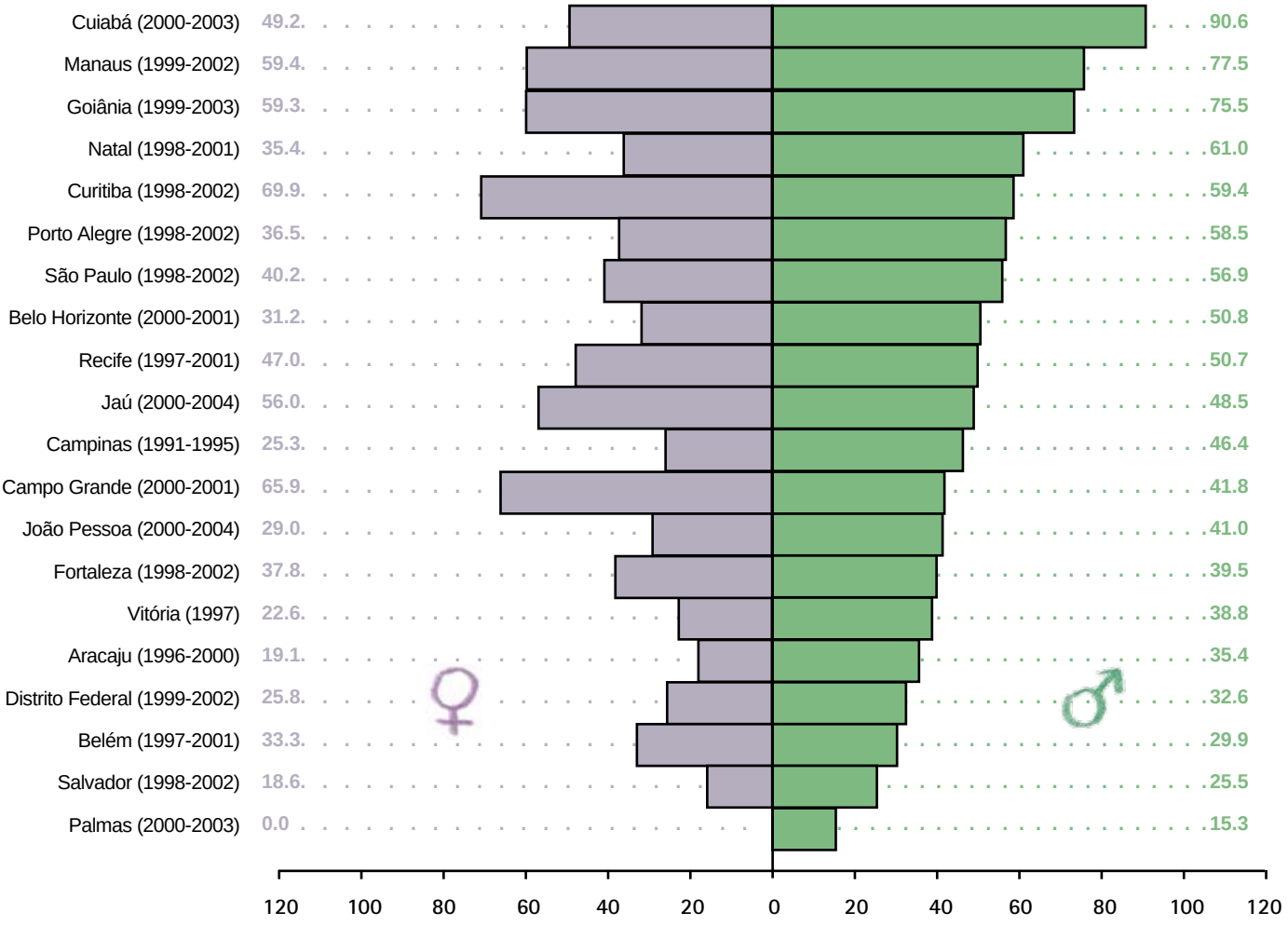

Figure 59. Distribution of average incidence rate by Leukemias (Group I), age-adjusted*, per million children and adolescents, by sex, according to PBCR and reference period

*World Standard Population, modified by Doll et al. (1966)
Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística IBGE
MS/INCA/Conprev/Divisão de Informação

In states covered by the United States SEER program, the average leukemia incidence rates were higher in white children (45.6 per million) compared to black children (27.8 per million), from 1986 to 1995, between ages 0 to 14. The authors observed a difference in incidence rates that was three times higher among ages 2 and 3 (Ries, 1999). Between 2001 and 2003, the average leukemia age-adjusted incidence rate[b] for boys aged 0 to 19 was 47.22 per million, and for girls was 39.96 per million (Li, 2008).

In Europe, data from CI5 IX / IARC show that the highest age-adjusted incidence rate, 122 per million, occurred in Sondrio, Italy, in boys aged 0 to 19. The lowest rate, 13 per million, was observed in Haut-Rhin. For female counterparts, the highest incidence was observed in Varese, Italy, with 101 per million, and the lowest rate was observed in Antwerp, Belgium, with 10 per million (Curado, 2007). In the United Kingdom, the annual rate for boys under 15 years old was 50 per million and for girls 41 per million (Stiller, 2007).

b Rates per million, adjusted for USA Standard Population, 2000.

The highest age-adjusted incidence rate[c] for boys in Brazil was 90.6 per million, observed in Cuiabá (2000-2003), and the lowest rate was 25.5 per million, observed in Salvador (1998-2002). The highest rate for girls was 69.9, observed in Curitiba (1998-2002) and the lowest rate was 18.6 per million, which also occurred in Salvador (1998-2002).

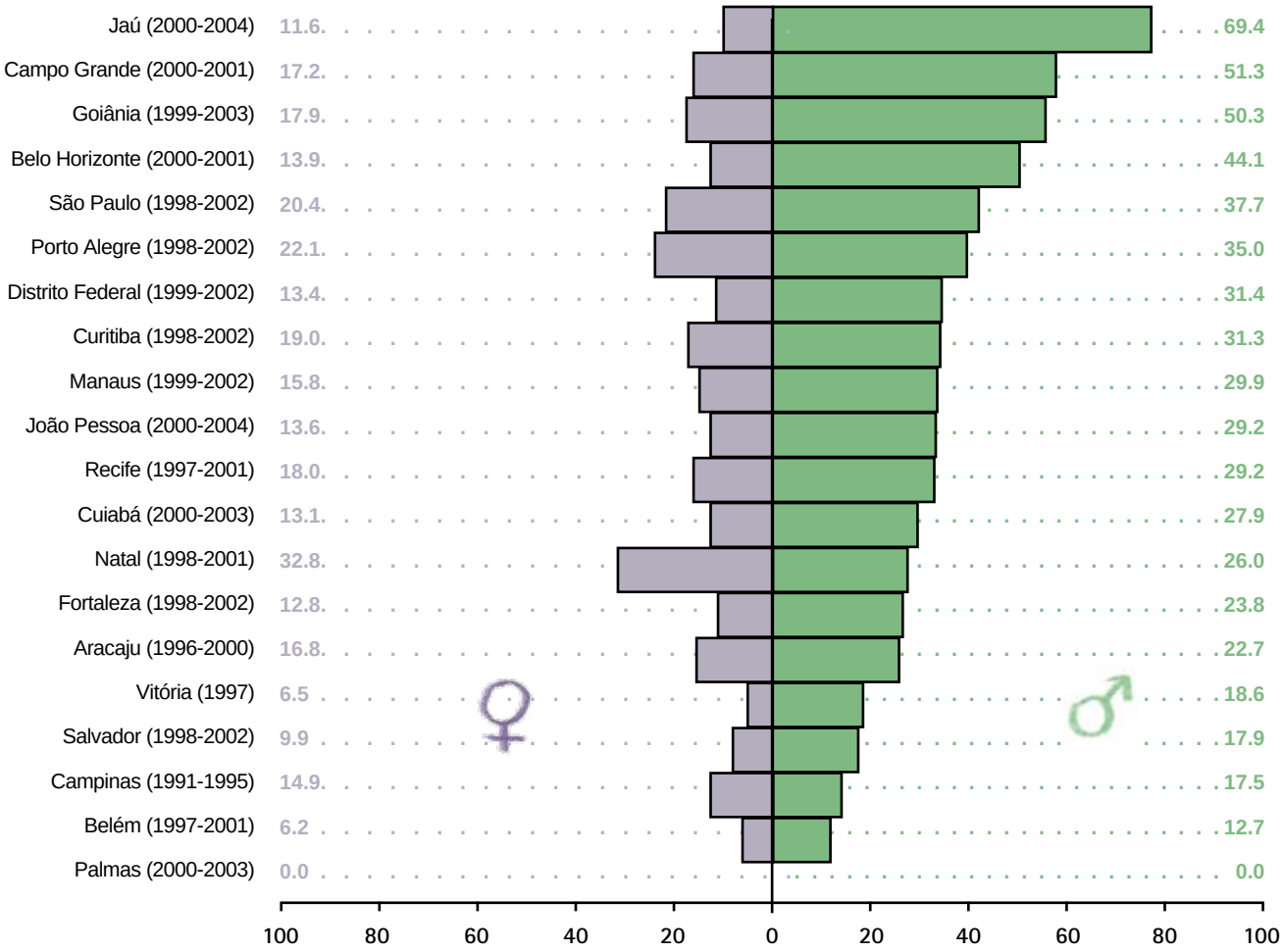

Figure 60 - Distribution of average incidence rate by Lymphomas (GROUP II), age-adjusted*, per million children and adolescents, by sex, according to PBCR and reference period

*World Standard Population, modified by Doll et al. (1966)
Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística IBGE
MS/INCA/Conprev/Divisão de Informação

This group represents approximately 15% of neoplasms diagnosed in the United States, within states covered by SEER and renders it the third most common type of cancer, behind leukemia and CNS tumors (Ries, 1999). From 2001 to 2003, the average age-adjusted incidence rate[b] of lymphomas in boys aged 0 to 19 was 27.84 per million, and for girls, 20.25 per million (Li, 2008).

In Europe, the information published by CI5 IX / IARC for ages 0 to 19 reveal that the highest incidence in boys was observed in Modena, Italy, at a rate of 69 per million, and the lowest was in Mecklenburg-Western Pomerania, Germany, with 14 per million. The highest incidence in girls was observed in Parma, Italy, at a rate of 64 per million, and the lowest was observed in Albacete, Spain, at

b Rates per million, ajusted for USA Standard Population, 2000.
c Rates per million, ajusted for World Standard Population, 1966.

a rate of 6 per million (Curado, 2007). In the United Kingdom, the annual incidence rate in boys under 15 years old was 17 per million and 8 per million in girls.

In Brazil, the highest average age-adjusted incidence rates[c] for males was observed in Campo Grande (2000-2001), at a rate of 51.3 per million, and the lowest was observed in Belém (1997-2001), at a rate of 17.5 per million. For females, the highest incidence was observed in Natal (1998-2001), at a rate of 32.8 per million, and the lowest was observed in Grande Vitória (1997), at a rate of 6.5 per million.

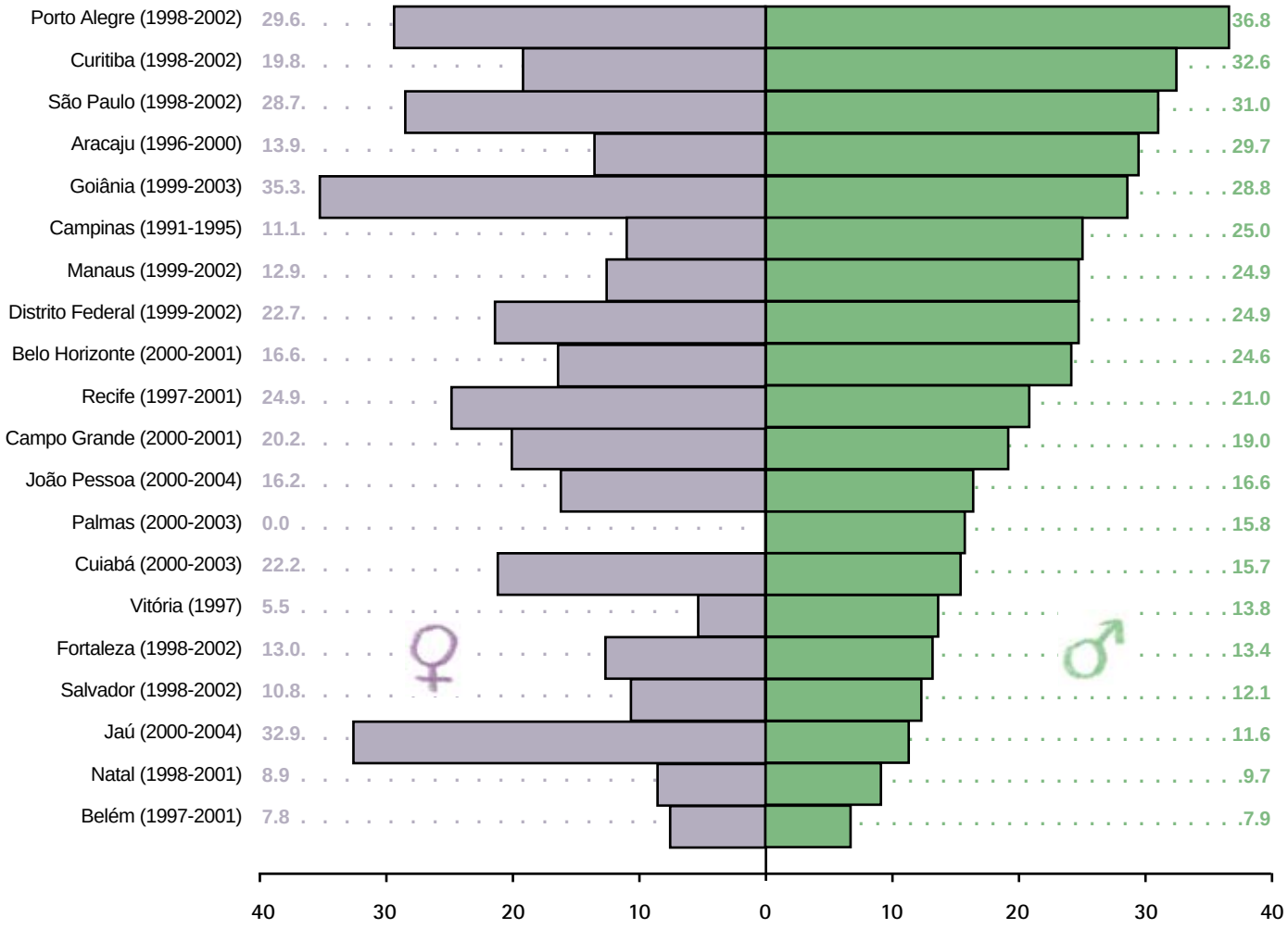

Figure 61 - Distribution of average incidence rate by CNS Tumor (Group III), age-adjusted*, per million children and adolescents, by sex, according to PBCR and reference period

*World Standard Population, modified by Doll et al. (1966)
Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística IBGE
MS/INCA/Conprev/Divisão de Informação

This group represents 16.6% of all neoplasms diagnosed in the US states covered by SEER. It is the second type of cancer that most afflicts children and adolescents under the age of 20, second only to the leukemia group (Ries, 1999). Between 2001 and 2003, the average age-adjusted incidence rate[b] of CNS tumors in the 0-19 age group was 30.96 per million in boys and 27.40 per million in girls (Li, 2008).

In Europe, the information published by CI5 IX / IARC for ages 0 to 19 reveal that the highest incidence in boys was observed in Brescia, Italy (1999-2001), at a rate of 54 per million, and the lowest was in Martinique (1998-2002) and Tarn (1998-2002), both at a rate of 4 per million. The highest incidence

b Rates per million, adjusted for USA Standard Population, 2000.

c Rates per million, adjusted for World Standard Population, 1966

in girls was observed in Neuchatel, Switzerland (1998-2002), at a rate of 56 per million, and the lowest was observed in Malta (1998-2002) and Antwerp, Belgium (1998-2002), both at a rate of 4 per million (Curado, 2007). In the United Kingdom, the annual incidence rate in boys under 15 years old was 35 per million and 32 per million in girls (Stiller, 2007).

In Brazil, the highest average age-adjusted incidence rates[c] for males was observed in Porto Alegre (1998-2002), at a rate of 36.8 per million, and the lowest was observed in Belém (1997-2001), at a rate of 7.9 per million. For females, the highest incidence was observed in Goiânia (1999-2003), at a rate of 35.3 per million, and the lowest was observed in Grande Vitória (1997), at a rate of 5.5 per million.

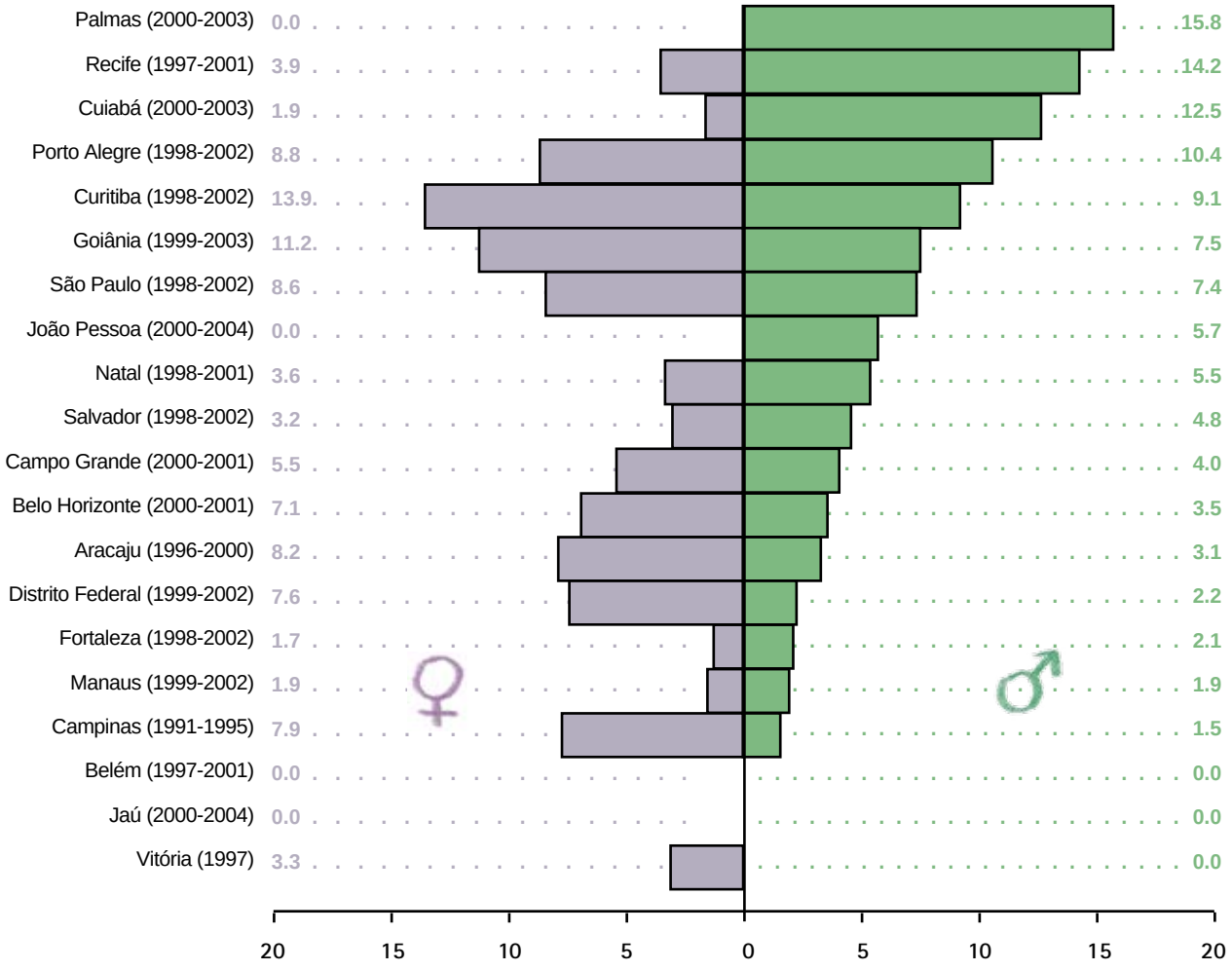

Figure 62 - Distribution of average incidence rate by neuroblastoma (Group IV), age-adjusted*, per million children and adolescents, by sex, according to PBCR and reference period

*World Standard Population, modified by Doll et al. (1966)
Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística IBGE
MS/INCA/Conprev/Divisão de Informação

c Rates per million, adjusted for World Standard Population, 1966

In states covered by the United States SEER program between 1975 and 1995, approximately 700 children and adolescents under the age of 20 are diagnosed each year with this type of tumor, and approximately 650 of these are neuroblastoma. This tumor represents approximately 7.8% of all tumors in children under the age of 15. The average annual age-adjusted incidence rate was 9.5 per million children (Ries, 1999). For the period 2001-2003, the average age-adjusted incidence rate[b] for neuroblastoma in ages 0 to 19 was 8.39 per million in boys and 8.16 per million in girls (Li, 2008).

In the United Kingdom, the annual rate for ages under 15 was 10 boys per million and 8 girls per million (Stiller, 2007).

In Brazil, the highest average age-adjusted incidence rate[c] in boys was observed in Recife (1997-2001), at 14.2 per million, and the lowest occurred in Campinas (1991-1995), at 1.5 per million. As for the female sex, the highest rate occurred in Curitiba (1998-2002), at 13.9 per million, and the lowest rate occurred in Fortaleza (1998-2002), at 1.7 per million.

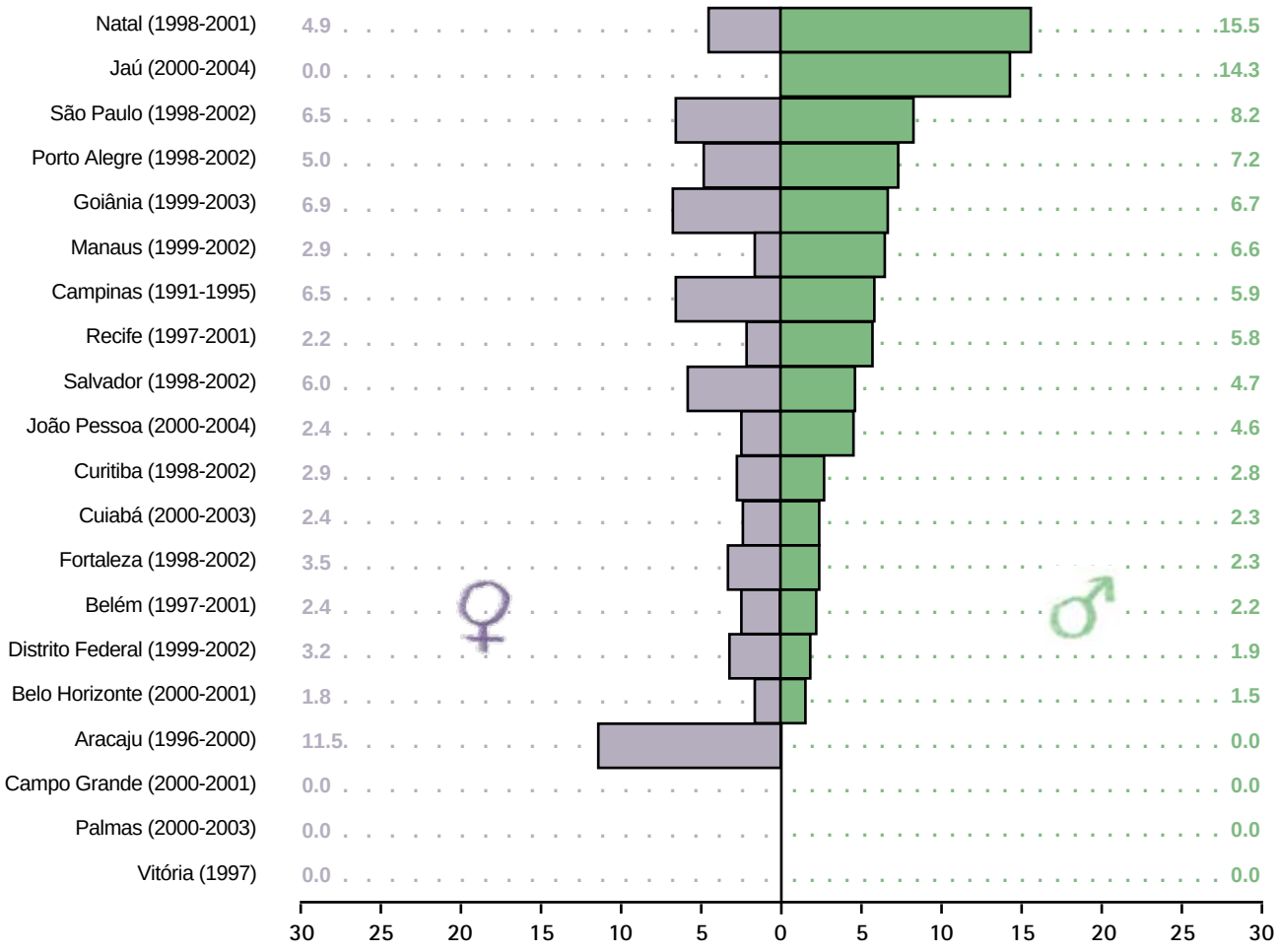

Figure 63- Distribution of average incidence rate by Retinoblastoma (Group V), age-adjusted*, per million children and adolescents, by sex, according to PBCR and reference period

*World Standard Population, modified by Doll et al. (1966)
Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística IBGE
MS/INCA/Conprev/Divisão de Informação

b Rates per million, adjusted for USA Standard Population, 2000.

c Rates per million, adjusted for World Standard Population, 1966

Between 1975 and 1995, the states covered by the United States SEER program showed that retinoblastoma was responsible for approximately 11% of cancer cases that develop during the child's first year of life. However, childhood cancer is generally responsible for 3% of total cancer cases in children younger than 15 years old. Approximately 300 children and adolescents younger than 20 are diagnosed with retinoblastoma each year (Ries, 1999). From 2001 to 2003, the average age-adjusted incidence rate[b] between ages 0 and 19 was 3.19 per million in boys and 2.78 per million in girls (Li, 2008).

In Europe, the information published by CI5 IX / IARC for ages 0 to 19 reveal that the highest incidence in boys was observed in Umbria, Italy, at a rate of 18 per million, and the lowest was in Munich, Germany, with 1 per million. The highest incidence in girls was observed in Malta, at a rate of 18 per million, and the lowest was observed in Munich, Germany, at a rate of 1 per million (Curado, 2007). In the United Kingdom, the annual incidence rate in boys under 15 years old was 4.5 per million and 4.6 per million in girls (Stiller, 2007).

In Brazil, the highest average age-adjusted incidence rate[c] for males was observed in Natal (1998-2002), at a rate of 15.5 per million, and the lowest was observed in Belo Horizonte (2000-2001), at a rate of 1.5 per million. For females, the highest incidence was observed in Aracaju (1996-2000), at a rate of 11.5 per million, and the lowest was observed in Belo Horizonte (2000-2001).

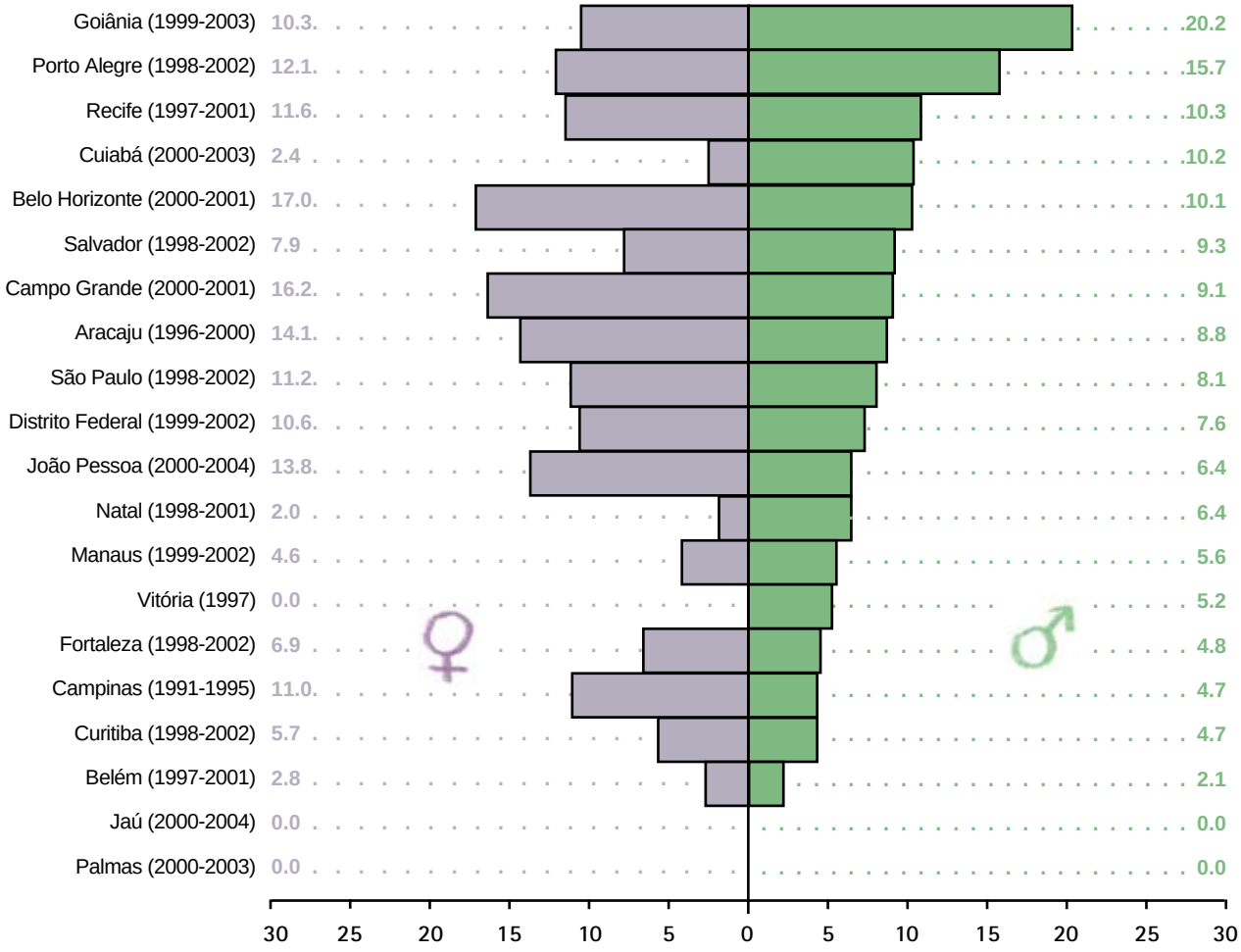

Figure 64 - Distribution of average incidence rate by Renal Tumors (Group VI), age-adjusted*, per million children and adolescents, by sex, according to PBCR and reference period

*World Standard Population, modified by Doll et al. (1966)
Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística IBGE
MS/INCA/Conprev/Divisão de Informação

b Rates per million, adjusted for USA Standard Population, 2000.

c Rates per million, adjusted for World Standard Population, 1966

In the states covered by the United States SEER program between 1975 and 1995, this group of neoplasms is responsible for 6.3% of cancer diagnosis in children under 15 and 4.4% of cancer diagnosis in children and adolescents under the age of 20. The average incidence rate was 6.2 per million children and adolescents under 20. Approximately 550 cases are diagnosed each year within the United States, and approximately 500 of these are Wilm's tumor, representing 95% of diagnosis of this group of neoplasms (Ries, 1999). From 2001 to 2003, the average age-adjusted incidence rate[b] of renal tumors for ages 0 to 19 was 6.17 per million in boys, and 7.14 per million in girls (Li, 2008).

In Europe, the information published by CI5 IX / IARC for ages 0 to 19 reveal that the highest incidence in boys was observed in Bas-Rhin, France, and Ticino, Switzerland, both at a rate of 23 per million, and the lowest was in the Czech Republic, with 2 per million. The highest incidence in girls was observed in Sondrio and Parma, Italy (1998-2002), both at a rate of 24 per million, and the lowest was observed in Granada, Spain (1998-2002), at a rate of 2 per million (Curado, 2007). In the United Kingdom, the annual incidence rate in boys and girls under 15 years old was 8.2 per million (Stiller, 2007).

In Brazil, the highest average age-adjusted incidence rate[c] for males was observed in Goiânia (1999-2003), at a rate of 20.2 per million, and the lowest was observed in Belém (1997-2001), at a rate of 2.1 per million. For females, the highest incidence was observed in Belo Horizonte (2000-2001), at a rate of 17.0 per million, and the lowest was observed in Natal (1998-2001), at a rate of 2.0 per million.

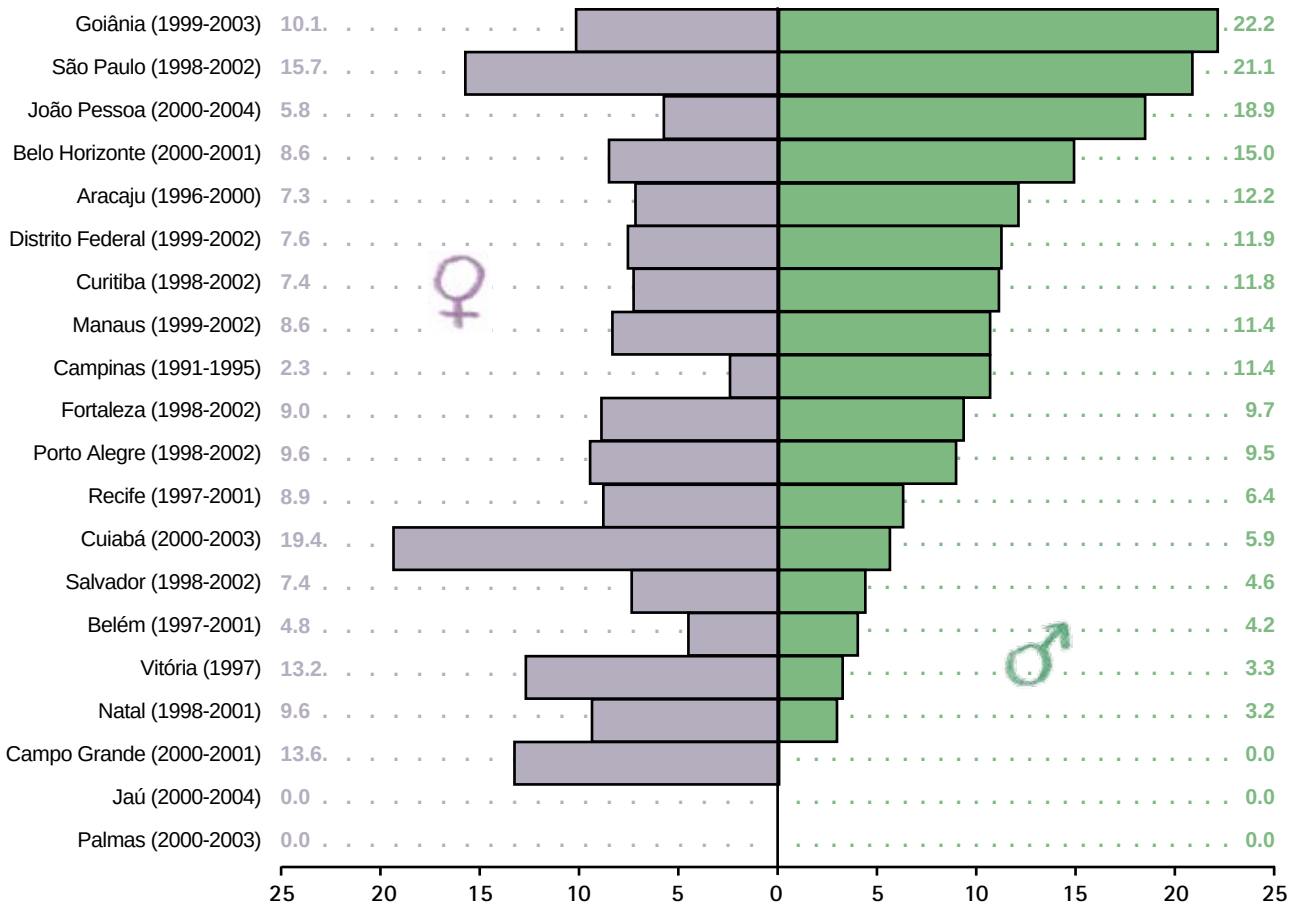

Figure 65 - Distribution of average incidence rate by Malignant bone tumors (Group VIII), age-adjusted*, per million children and adolescents, by sex, according to the PBCR and reference period

*World Standard Population, modified by Doll et al. (1966)
Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística IBGE
MS/INCA/Conprev/Divisão de Informação

b Rates per million, adjusted for USA Standard Population, 2000.

c Rates per million, adjusted for World Standard Population, 1966

In states covered by the United States SEER program between 1975 and 1995, this group of neoplasms presented an average annual incidence rate of 8.7 per million children and adolescents under 20 years old. Bone tumors represent 6.7% of all tumors in infancy within the geographical areas covered by SEER. Approximately 700 children are diagnosed each year with this type of tumor, and approximately 400 of these are osteosarcoma and 200 are Ewing sarcoma (Ries, 1999). From 2001 to 2003, the average age-adjusted incidence rate[b] of malignant bone tumors in ages 0 to 19 was 9.97 per million in boys and 7.79 per million in girls (Li, 2008).

In Europe, the information published by CI5 IX / IARC for ages 0 to 19 reveal that the highest incidence in boys was observed in Girona, Spain, at a rate of 29 per million, and the lowest was in Sassari, Italy, with 3 per million. The highest incidence in girls was observed in Sondrio, Italy, at a rate of 30 per million, and the lowest was observed in Warsaw, Poland, at a rate of 2 per million (Curado, 2007). In the United Kingdom, the annual incidence rate in children under 15 years old was 5 per million in boys and 4 per million in girls (Stiller, 2007).

In Brazil, the highest average age-adjusted incidence rate[c] for males was observed in Goiânia (1999-2003), at a rate of 22.2 per million, and the lowest was observed in Natal (1998-2001), at a rate of 3.2 per million. For females, the highest incidence was observed in Cuiabá (2000-2003) at a rate of 19.4 per million, and the lowest was observed in Campinas (1991-1995), at a rate of 2.3 per million.

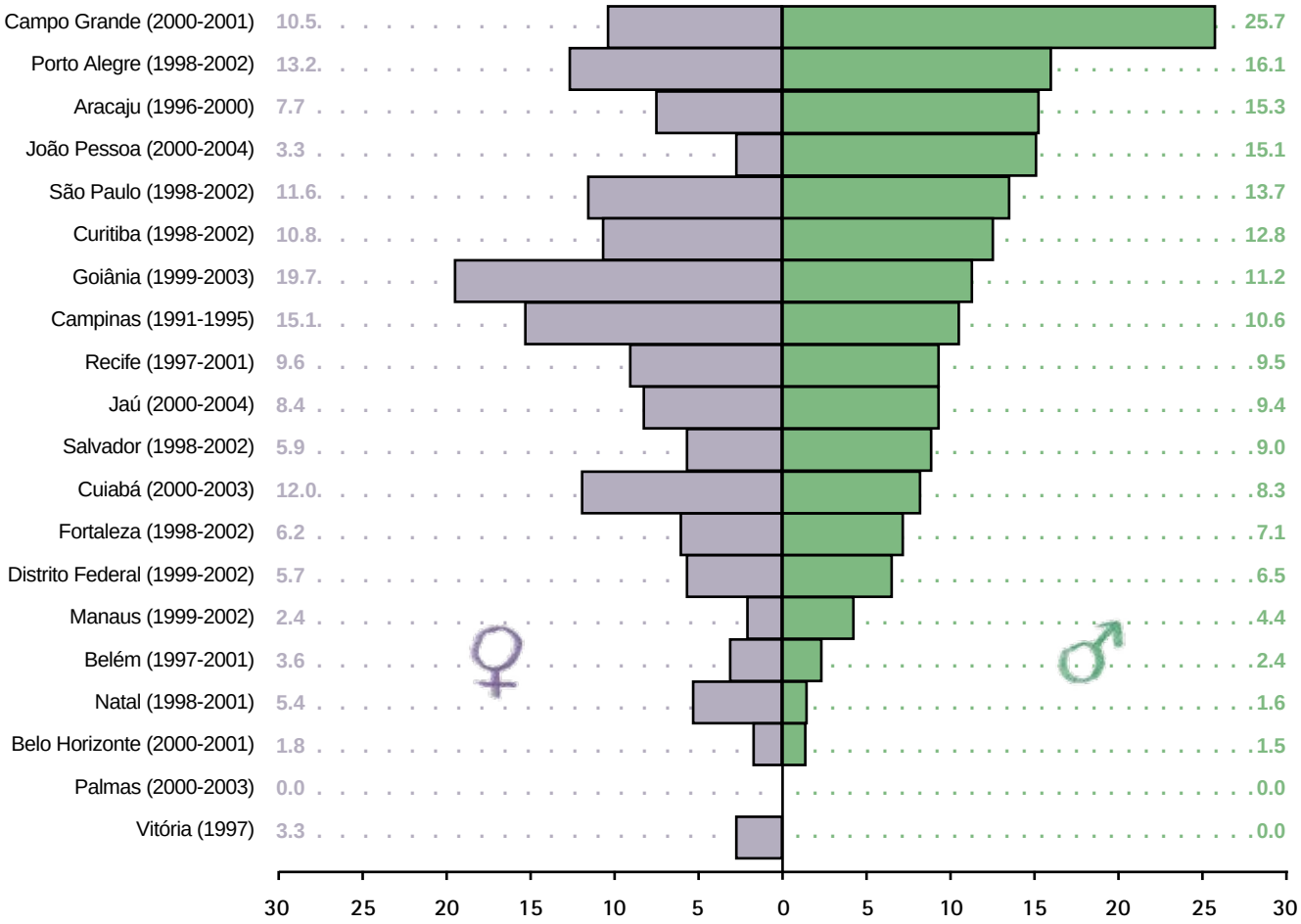

Figure 66 - Distribution of average incidence rate by Soft Tissue Sarcoma (Group IX), age-adjusted*, per million children and adolescents, by sex, according to PBCR and reference period

*World Standard Population, modified by Doll et al. (1966)
Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística IBGE
MS/INCA/Conprev/Divisão de Informação

b Rates per million, adjusted for USA Standard Population, 2000.

c Rates per million, adjusted for World Standard Population, 1966

In states covered by the United States SEER program between 1975 and 1995, this group of neoplasms presented an average annual incidence rate of 11.0 per million children and adolescents under 20 years old, representing 7,4% of all cases. Approximately 900 children are diagnosed each year with this type of tumor, and approximately 350 of these are rhabdomyosarcoma (Ries, 1999). From 2001 to 2003, the average age-adjusted incidence rate[b] of soft tissue sarcoma in ages 0 to 19 was 12.89 per million in boys and 10.75 per million in girls (Li, 2008). In the United Kingdom, the annual incidence rate in children under 15 years old was 10.6 per million in boys and 7 per million in girls (Stiller, 2007).

In Brazil, the highest average age-adjusted incidence rate[c] for males was observed in Campo Grande (2000-2001), at a rate of 25.7 per million, and the lowest was observed in Belo Horizonte (2000-2001), at a rate of 1.5 per million. For females, the highest incidence was observed in Goiânia (1999-2003) at a rate of 19.7 per million, and the lowest was observed in Belo Horizonte (2000-2001), at a rate of 1.8 per million.

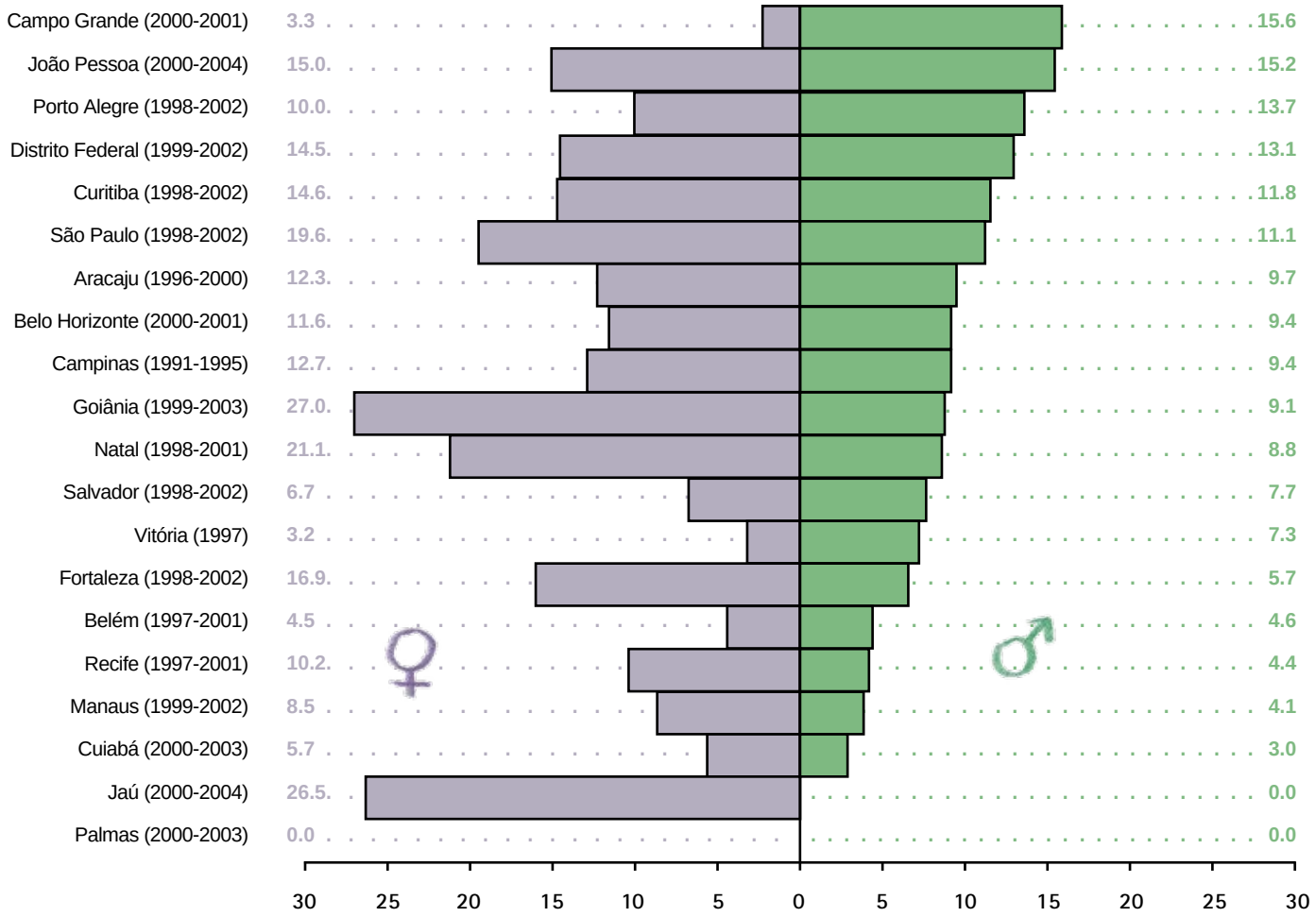

Figure 67 - Distribution of average incidence rate by Carcinoma and Other Malignant Neoplasms (Group XI), age-adjusted*, per million children and adolescents, by sex, according to PBCR and reference period

*World Standard Population, modified by Doll et al. (1966)
Sources: Data from Population-Based Cancer Registries
MP/Fundação Instituto Brasileiro de Geografia e Estatística IBGE
MS/INCA/Conprev/Divisão de Informação

b Rates per million, adjusted for USA Standard Population, 2000.

c Rates per million, adjusted for World Standard Population, 1966

IV.2 Mortality Information

From 2001 to 2005, death caused by cancer is one of the 10 most likely causes of death in Brazil and Regions between the ages of 1 and 18 (**Table 64**).

In Brazil, death between ages 1 and 18 caused by neoplasia is the fourth and fifth most common cause of death for males and females, respectively. It is worth noting that after 5 years old, with the exception of external causes and poorly defined causes, death from cancer is the first most common cause of death (**Table 64**).

For the North and Northeast regions, neoplasms rank as the fifth cause of death for both male and female between ages 1 and 18 (**Tables 65 and 66**). In the Northeast, death caused by cancer is the third cause of death after the age of 5; however, it is the fourth in females within the 15-18 age range. In the Middle West Region neoplasms were the second most common cause of death for males and the third for females, while in the Southeast and South, it is ranked as second for both male and female (**Tables 67, 68, 69**).

Ill-defined causes reflect the quality of information in the cause-of-death statement. Death by ill-defined causes is found in Chapter XVI – Symptoms, Signs, and Ill-Defined Conditions (Codes 780-799) of the 9th Revision (ICD-9) and of Chapter XVIII – Symptoms, Signs and Abnormal Clinical and Laboratory Findings, Not Elsewhere Classified (Codes R00-R99), from the 10th Revision of the International Classification of Diseases (ICD-10). There was considerable reduction in deaths by ill-defined causes due to better information from 1979 to 2005, in the North (from 26.0% to 17.7%) and Northeast (from 45.7% to 17.2%). In the Middle West and South, percentages increased from 16.7% to 5.2% and from 14.8% to 5.8%, respectively. The Southeast presented an unstable pattern (**Table 71 and Figure 68**).

Age-adjusted mortality rates[c] of all types of cancer in Brazil and its five regions, from 1979 to 2005, are displayed in **Table 72**. In Brazil, approximately 44 boys for every million boys die of cancer, and the ratio changes to 36 per million for girls. In the five regions, rates varied from 39.3 to 51.9/1,000,000 for boys and from 32.9 to 41.5/1,000,000 for girls. The highest rates for boys were observed in the Middle West region (52 per million) and the highest rates for girls were observed in the South (42 per million). The Northern region presented the lowest mortality rates for both male and female population (39 and 33 per million, respectively).

A slight decrease in mortality rates was observed for all types of cancer in Brazil between 1979 and 2005. The trend analysis by Estimated Annual Percent Change (EAPC) reveals this albeit insignificant reduction (**Figure 70**). The annual average increase (or decrease) may be observed in more detail in **Table 83**.

The analyses by region present very distinct profiles. The North and Northeast region presented a significant increase in mortality rates and the Middle West, Southeast and South showed mortality reduction. This decrease was significant in the Southeast and South, which can explain part of the slight decrease in Brazil as a whole. It is worth noting that, after the year 2000, there was an expressive improvement in information quality from the North and Northeast, where a part of the ill-defined causes may have been classified as cancer.

Analysis of the five main causes of death caused by cancer in the 1-18 age group showed that leukemias and central nervous system tumors (CNS) ranked 1st and 2nd, respectively. Lymphatic

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c Rates per million, adjusted for World Standard Population, 1966

tissue neoplasms (Hodgkin's and Non-Hodgkin lymphomas), bone tumors, soft-tissue tumors, and renal tumors were distributed in the remaining positions (**Table 73**).

Figure 71 shows the percentage distribution of mortality by the main types of malignant tumors according to age and sex. The highest death rates caused by lymphoma were observed in the youngest (ages 1-4) and oldest (ages 15-18). The predominance of leukemia was observed in the 5-9 age group. Death arising from CNS tumors were similarly distributed, with the exception of children younger than 1 year old.

Table 64. Ten main causes of death by sex and age range, Brazil, 2001-2005

Age-group	1-18		< 1		1-4		5-9		10-14		15-18	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
All Causes	115,351	61,051	159,001	123,109	26,958	22,604	14,812	10,723	18,578	11,504	55,003	16,220
1st	External causes 64,868	External causes 17,873	Perinatal Infections 90,616	Perinatal Infections 67,902	External causes 5,762	Respiratory Tract 3,981	External causes 6,142	External causes 3,216	External causes 9,808	External causes 4,121	External causes 43,156	External causes 6,817
2nd	Poorly Defined 9,442	Respiratory Tract 6,857	Congenital Malformations 20,479	Congenital Malformations 18,135	Respiratory Tract 4,473	External causes 3,719	Neoplasms 1,861	Neoplasms 1,534	Neoplasms 1,789	Neoplasms 1,450	Poorly Defined 2,643	Neoplasms 1,518
3rd	Respiratory Tract 7,929	Poorly Defined 6,856	Poorly Defined 12,896	Poorly Defined 9,618	Poorly Defined 3,916	Infectious and Parasitic 3,538	Poorly Defined 1,382	Poorly Defined 1,110	Poorly Defined 1,501	Poorly Defined 1,117	Neoplasms 2,097	Poorly Defined 1,380
4th	Neoplasms 7,559	Infectious and Parasitic 6,028	Infectious and Parasitic 11,901	Infectious and Parasitic 9,106	Infectious and Parasitic 3,751	Poorly Defined 3,249	Infectious and Parasitic 1,098	Infectious and Parasitic 988	Nervous System 1,107	Respiratory Tract 870	Circulatory System 1,456	Circulatory System 1,065
5th	Infectious and Parasitic 6,882	Neoplasms 5,995	Respiratory Tract 10,297	Respiratory Tract 8,106	Congenital Malformations 1,905	Congenital Malformations 1,852	Nervous System 1,083	Respiratory Tract 963	Respiratory Tract 1,015	Nervous System 823	Respiratory Tract 1,383	Respiratory Tract 1,043
6th	Nervous System 5,294	Nervous System 4,019	Endocrinal Diseases 3,393	Endocrinal Diseases 2,874	Nervous System 1,813	Nervous System 1,556	Respiratory Tract 1,058	Nervous System 873	Infectious and Parasitic 932	Circulatory System 727	Nervous System 1,291	Labor and Puerperium 910
7th	Circulatory System 3,559	Congenital Malformations 2,967	External causes 3,099	External causes 2,396	Neoplasms 1,812	Neoplasms 1,493	Congenital Malformations 501	Congenital Malformations 492	Circulatory System 872	Infectious and Parasitic 723	Infectious and Parasitic 1,101	Infectious and Parasitic 779
8th	Congenital Malformations 3,115	Circulatory System 2,963	Nervous System 2,109	Nervous System 1,597	Endocrinal Diseases 1,171	Endocrinal Diseases 1,151	Circulatory System 492	Circulatory System 468	Congenital Malformations 395	Congenital Malformations 362	Digestive System 482	Nervous System 767
9th	Endocrinal Diseases 2,005	Endocrinal Diseases 2,017	Circulatory System 1,211	Circulatory System 1,067	Circulatory System 739	Circulatory System 703	Endocrinal Diseases 330	Endocrinal Diseases 257	Digestive System 307	Digestive System 306	Congenital Malformations 314	Digestive System 431
10th	Digestive System 1,605	Digestive System 1,417	Digestive System 1,070	Hematopoietic Diseases 757	Hematopoietic Diseases 557	Hematopoietic Diseases 494	Digestive System 281	Hematopoietic Diseases 256	Endocrinal Diseases 234	Hematopoietic Diseases 249	Hematopoietic Diseases 290	Endocrinal Diseases 365

Source: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM

Table 65. Ten main causes of death by sex and age range, North Region, 2001 to 2005

Age-group	1-18		< 1		1-4		5-9		10-14		15-18	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
All Causes	11,735	7,339	18,496	14,142	3,834	3,140	1,875	1,263	1,890	1,302	4,136	1,634
1st	External causes 4,974	External causes 1,775	Perinatal Infections 10,327	Perinatal Infections 7,583	Poorly Defined 899	Poorly Defined 706	External causes 724	External causes 362	External causes 831	External causes 412	External causes 2,727	External causes 552
2nd	Poorly Defined 1,941	Poorly Defined 1,351	Poorly Defined 2,163	Poorly Defined 1,652	External causes 692	Infectious and Parasitic 560	Poorly Defined 304	Poorly Defined 226	Poorly Defined 288	Poorly Defined 199	Poorly Defined 450	Poorly Defined 220
3rd	Infectious and Parasitic 1,200	Infectious and Parasitic 959	Congenital Malformations 1,825	Congenital Malformations 1,569	Infectious and Parasitic 648	Respiratory Tract 550	Neoplasms 190	Infectious and Parasitic 167	Infectious and Parasitic 160	Neoplasms 126	Infectious and Parasitic 204	Neoplasms 155
4th	Respiratory Tract 1,056	Respiratory Tract 875	Infectious and Parasitic 1,630	Infectious and Parasitic 1,216	Respiratory Tract 631	External causes 449	Infectious and Parasitic 188	Neoplasms 125	Neoplasms 140	Infectious and Parasitic 122	Respiratory Tract 162	Labor and Puerperium 139
5th	Neoplasms 667	Neoplasms 564	Respiratory Tract 1,301	Respiratory Tract 1,075	Neoplasms 199	Endocrinal Diseases 163	Respiratory Tract 135	Respiratory Tract 117	Respiratory Tract 128	Respiratory Tract 114	Circulatory System 144	Infectious and Parasitic 110
6th	Circulatory System 373	Circulatory System 330	Endocrinal Diseases 416	Endocrinal Diseases 385	Endocrinal Diseases 186	Congenital Malformations 159	Nervous System 76	Circulatory System 54	Circulatory System 97	Circulatory System 84	Neoplasms 138	Circulatory System 105
7th	Nervous System 356	Nervous System 275	Nervous System 184	External causes 137	Congenital Malformations 158	Neoplasms 158	Circulatory System 62	Nervous System 51	Nervous System 77	Nervous System 53	Digestive System 78	Respiratory Tract 94
8th	Endocrinal Diseases 288	Endocrinal Diseases 245	Circulatory System 149	Nervous System 133	Nervous System 135	Nervous System 123	Endocrinal Diseases 41	Digestive System 36	Digestive System 51	Digestive System 39	Nervous System 68	Digestive System 58
9th	Congenital Malformations 247	Congenital Malformations 226	External causes 149	Circulatory System 123	Digestive System 75	Circulatory System 87	Congenital Malformations 41	Hematopoietic Diseases 35	Hematopoietic Diseases 30	Musculoskeletal System 32	Endocrinal Diseases 36	Nervous System 48
10th	Digestive System 237	Digestive System 193	Digestive System 139	Hematopoietic Diseases 90	Circulatory System 70	Digestive System 60	Digestive System 33	Endocrinal Diseases 30	Congenital Malformations 28	Hematopoietic Diseases 29	Hematopoietic Diseases 34	Musculoskeletal System 37

Source: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM

Table 66. Ten main causes of death by sex and age range, Northeast Region, 2001 to 2005

Age-group	Ages 1-18		Under age 1		Ages 1-4		Ages 5-9		Ages 10-14		Ages 15-18	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
All Causes	34,389	20,111	58,972	44,254	9,625	8,248	4,871	3,475	5,589	3,523	14,304	4,865
1st	External causes 16,406	External causes 4,690	Perinatal Infections 32,605	Perinatal Infections 23,574	Poorly Defined 2,012	Poorly Defined 1,719	External causes 1,831	External causes 948	External causes 2,643	External causes 1,093	External causes 10,282	External causes 1,612
2nd	Poorly Defined 4,598	Poorly Defined 3,447	Poorly Defined 7,271	Poorly Defined 5,357	Respiratory Tract 1,712	Respiratory Tract 1,522	Poorly Defined 721	Poorly Defined 545	Poorly Defined 703	Poorly Defined 541	Poorly Defined 1,162	Poorly Defined 642
3rd	Respiratory Tract 2,792	Respiratory Tract 2,427	Infectious and Parasitic 5,908	Infectious and Parasitic 4,409	External causes 1,650	Infectious and Parasitic 1,345	Neoplasms 527	Neoplasms 418	Neoplasms 499	Neoplasms 364	Neoplasms 603	Circulatory System 414
4th	Infectious and Parasitic 2,463	Infectious and Parasitic 2,138	Congenital Malformations 5,112	Congenital Malformations 4,407	Infectious and Parasitic 1,396	External causes 1,037	Respiratory Tract 368	Respiratory Tract 319	Infectious and Parasitic 327	Circulatory System 283	Circulatory System 525	Neoplasms 400
5th	Neoplasms 2,146	Neoplasms 1,602	Respiratory Tract 3,628	Respiratory Tract 2,844	Neoplasms 517	Endocrinal Diseases 497	Infectious and Parasitic 345	Infectious and Parasitic 305	Respiratory Tract 317	Respiratory Tract 261	Infectious and Parasitic 395	Labor and Puerperium 368
6th	Nervous System 1,445	Circulatory System 1,092	Endocrinal Diseases 1,770	Endocrinal Diseases 1,540	Nervous System 509	Congenital Malformations 477	Nervous System 311	Nervous System 245	Circulatory System 315	Infectious and Parasitic 226	Respiratory Tract 395	Respiratory Tract 325
7th	Circulatory System 1,295	Nervous System 1,086	Nervous System 599	Nervous System 468	Endocrinal Diseases 467	Nervous System 455	Circulatory System 181	Circulatory System 163	Nervous System 300	Nervous System 190	Nervous System 325	Infectious and Parasitic 262
8th	Endocrinal Diseases 745	Endocrinal Diseases 799	Hematopoietic Diseases 510	Hematopoietic Diseases 421	Congenital Malformations 435	Neoplasms 420	Endocrinal Diseases 130	Congenital Malformations 140	Digestive System 101	Digestive System 124	Digestive System 162	Nervous System 196
9th	Congenital Malformations 740	Congenital Malformations 774	External causes 507	External causes 394	Circulatory System 274	Hematopoietic Diseases 232	Congenital Malformations 130	Hematopoietic Diseases 93	Congenital Malformations 88	Hematopoietic Diseases 91	Hematopoietic Diseases 101	Digestive System 142
10th	Digestive System 564	Hematopoietic Diseases 499	Circulatory System 375	Circulatory System 329	Hematopoietic Diseases 252	Circulatory System 232	Digestive System 106	Genitourinary System 87	Hematopoietic Diseases 87	Endocrinal Diseases 84	Genitourinary System 95	Endocrinal Diseases 132

Source: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM

Table 67. Ten main causes of death by sex and age range, Middle West Region, 2001 to 2005

Age-group	1-18		< 1		1-4		5-9		10-14		15-18	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
All Causes	8,662	4,699	10,889	8,637	2,074	1,621	1,185	798	1,443	962	3,960	1,318
1st	External causes 5,323	External causes 1,800	Perinatal Infections 6,234	Perinatal Infections 4,819	External causes 627	External causes 373	External causes 617	External causes 305	External causes 854	External causes 464	External causes 3,225	External causes 658
2nd	Neoplasms 601	Respiratory Tract 465	Congenital Malformations 1,896	Congenital Malformations 1,671	Infectious and Parasitic 315	Infectious and Parasitic 276	Neoplasms 169	Neoplasms 130	Neoplasms 142	Neoplasms 110	Neoplasms 153	Neoplasms 106
3rd	Respiratory Tract 531	Neoplasms 457	Respiratory Tract 706	Respiratory Tract 558	Respiratory Tract 280	Respiratory Tract 255	Nervous System 79	Nervous System 74	Nervous System 86	Nervous System 70	Respiratory Tract 113	Respiratory Tract 85
4th	Infectious and Parasitic 490	Infectious and Parasitic 430	Infectious and Parasitic 696	Infectious and Parasitic 525	Congenital Malformations 178	Congenital Malformations 137	Respiratory Tract 63	Infectious and Parasitic 61	Respiratory Tract 75	Respiratory Tract 68	Nervous System 96	Circulatory System 84
5th	Nervous System 410	Nervous System 338	Poorly Defined 367	External causes 251	Nervous System 149	Nervous System 128	Infectious and Parasitic 56	Respiratory Tract 57	Circulatory System 68	Circulatory System 63	Circulatory System 89	Labor and Puerperium 74
6th	Congenital Malformations 276	Congenital Malformations 243	External causes 307	Poorly Defined 225	Endocrinal Diseases 138	Neoplasms 111	Congenital Malformations 45	Congenital Malformations 41	Infectious and Parasitic 55	Infectious and Parasitic 47	Poorly Defined 89	Nervous System 66
7th	Poorly Defined 265	Circulatory System 236	Endocrinal Diseases 208	Endocrinal Diseases 178	Neoplasms 137	Endocrinal Diseases 109	Poorly Defined 37	Poorly Defined 36	Poorly Defined 48	Congenital Malformations 38	Infectious and Parasitic 64	Infectious and Parasitic 46
8th	Circulatory System 234	Poorly Defined 190	Nervous System 178	Nervous System 157	Poorly Defined 91	Poorly Defined 78	Circulatory System 31	Circulatory System 29	Congenital Malformations 32	Poorly Defined 34	Digestive System 29	Poorly Defined 42
9th	Endocrinal Diseases 193	Endocrinal Diseases 183	Circulatory System 110	Circulatory System 81	Hematopoietic Diseases 46	Circulatory System 60	Digestive System 25	Hematopoietic Diseases 17	Digestive System 24	Endocrinal Diseases 19	Hematopoietic Diseases 24	Endocrinal Diseases 40
10th	Digestive System 119	Digestive System 93	Digestive System 75	Digestive System 69	Circulatory System 46	Digestive System 34	Endocrinal Diseases 22	Digestive System 17	Endocrinal Diseases 16	Digestive System 15	Congenital Malformations 21	Digestive System 27

Source: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM

Table 68. Ten main causes of death by sex and age range, Southeast Region, 2001 to 2005

Age-group	1-18		< 1		1-4		5-9		10-14		15-18	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
All Causes	46,355	21,390	53,372	42,527	8,401	7,189	4,996	3,798	7,089	4,156	25,869	6,247
1st	External causes 29,454	External causes 6,848	Perinatal Infections 31,665	Perinatal Infections 24,508	External causes 1,927	External causes 1,328	External causes 2,067	External causes 1,108	External causes 3,953	External causes 1,495	External causes 21,507	External causes 2,917
2nd	Neoplasms 3,015	Neoplasms 2,445	Congenital Malformations 8,387	Congenital Malformations 7,663	Respiratory Tract 1,441	Respiratory Tract 1,298	Neoplasms 711	Neoplasms 615	Neoplasms 739	Neoplasms 623	Neoplasms 879	Neoplasms 615
3rd	Respiratory Tract 2,796	Respiratory Tract 2,412	Respiratory Tract 3,630	Respiratory Tract 2,820	Infectious and Parasitic 1,037	Infectious and Parasitic 1,037	Nervous System 434	Respiratory Tract 379	Nervous System 452	Nervous System 367	Poorly Defined 811	Respiratory Tract 418
4th	Poorly Defined 2,236	Infectious and Parasitic 1,926	Infectious and Parasitic 2,862	Infectious and Parasitic 2,304	Poorly Defined 763	Congenital Malformations 771	Infectious and Parasitic 396	Nervous System 352	Poorly Defined 394	Respiratory Tract 317	Respiratory Tract 575	Poorly Defined 395
5th	Nervous System 2,217	Nervous System 1,674	Poorly Defined 2,337	Poorly Defined 1,773	Nervous System 760	Nervous System 637	Respiratory Tract 391	Infectious and Parasitic 351	Respiratory Tract 389	Poorly Defined 288	Nervous System 571	Circulatory System 384
6th	Infectious and Parasitic 2,062	Poorly Defined 1,528	External causes 1,374	External causes 1,047	Congenital Malformations 747	Neoplasms 592	Poorly Defined 268	Poorly Defined 261	Circulatory System 304	Infectious and Parasitic 253	Circulatory System 546	Nervous System 318
7th	Circulatory System 1,308	Congenital Malformations 1,220	Nervous System 895	Nervous System 652	Neoplasms 686	Poorly Defined 584	Congenital Malformations 185	Circulatory System 193	Infectious and Parasitic 300	Circulatory System 238	Infectious and Parasitic 329	Infectious and Parasitic 285
8th	Congenital Malformations 1,215	Circulatory System 1,064	Endocrinal Diseases 731	Endocrinal Diseases 550	Circulatory System 286	Endocrinal Diseases 270	Circulatory System 172	Digestive System 177	Congenital Malformations 159	Congenital Malformations 153	Digestive System 163	Labor and Puerperium 216
9th	Endocrinal Diseases 558	Endocrinal Diseases 552	Circulatory System 490	Circulatory System 462	Endocrinal Diseases 266	Circulatory System 265	Endocrinal Diseases 102	Hematopoietic Diseases 92	Digestive System 100	Digestive System 93	Congenital Malformations 124	Digestive System 163
10th	Digestive System 516	Digestive System 491	Digestive System 384	Digestive System 265	Digestive System 169	Digestive System 143	Hematopoietic Diseases 85	Endocrinal Diseases 88	Endocrinal Diseases 88	Hematopoietic Diseases 92	Hematopoietic Diseases 111	Endocrinal Diseases 116

Source: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM

Table 69. Ten main causes of death by sex and age range, South Region, 2001 to 2005

Age-group	1-18		< 1		1-4		5-9		10-14		15-18	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
All Causes	14,210	7,512	17,272	13,549	3,024	2,406	1,885	1,389	2,567	1,561	6,734	2,156
1st	External causes 8,711	External causes 2,760	Perinatal Infections 9,785	Perinatal Infections 7,418	External causes 866	External causes 532	External causes 903	External causes 493	External causes 1,527	External causes 657	External causes 5,415	External causes 1,078
2nd	Neoplasms 1,130	Neoplasms 927	Congenital Malformations 3,259	Congenital Malformations 2,825	Respiratory Tract 409	Respiratory Tract 356	Neoplasms 264	Neoplasms 246	Neoplasms 269	Neoplasms 227	Neoplasms 324	Neoplasms 242
3rd	Nervous System 866	Respiratory Tract 678	Respiratory Tract 1,032	Respiratory Tract 809	Congenital Malformations 387	Infectious and Parasitic 320	Nervous System 183	Nervous System 151	Nervous System 192	Nervous System 143	Nervous System 231	Nervous System 139
4th	Respiratory Tract 754	Nervous System 646	Infectious and Parasitic 805	Infectious and Parasitic 652	Infectious and Parasitic 355	Congenital Malformations 308	Infectious and Parasitic 113	Infectious and Parasitic 104	Respiratory Tract 106	Respiratory Tract 110	Circulatory System 152	Respiratory Tract 121
5th	Infectious and Parasitic 667	Infectious and Parasitic 575	External causes 762	Poorly Defined 611	Neoplasms 273	Nervous System 213	Respiratory Tract 101	Respiratory Tract 91	Infectious and Parasitic 90	Infectious and Parasitic 75	Respiratory Tract 138	Labor and Puerperium 113
6th	Congenital Malformations 637	Congenital Malformations 504	Poorly Defined 758	External causes 567	Nervous System 260	Neoplasms 212	Congenital Malformations 100	Congenital Malformations 88	Circulatory System 88	Congenital Malformations 69	Poorly Defined 131	Poorly Defined 81
7th	Poorly Defined 402	Poorly Defined 340	Endocrinal Diseases 268	Endocrinal Diseases 221	Poorly Defined 151	Poorly Defined 162	Poorly Defined 52	Circulatory System 45	Congenital Malformations 88	Circulatory System 59	Infectious and Parasitic 109	Circulatory System 78
8th	Circulatory System 349	Circulatory System 241	Nervous System 253	Nervous System 187	Endocrinal Diseases 114	Endocrinal Diseases 112	Circulatory System 46	Endocrinal Diseases 42	Poorly Defined 68	Poorly Defined 55	Congenital Malformations 62	Infectious and Parasitic 76
9th	Endocrinal Diseases 221	Endocrinal Diseases 238	Digestive System 113	Circulatory System 72	Circulatory System 63	Circulatory System 59	Endocrinal Diseases 35	Poorly Defined 42	Endocrinal Diseases 39	Endocrinal Diseases 37	Digestive System 50	Endocrinal Diseases 47
10th	Digestive System 169	Digestive System 148	Circulatory System 87	Digestive System 61	Digestive System 55	Digestive System 49	Digestive System 33	Hematopoietic Diseases 23	Digestive System 31	Digestive System 35	Endocrinal Diseases 33	Digestive System 41

Source: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM

Table 70. Ten main causes of death by age range, Brazil and Regions, 2001-2005

Age-group	1-18					
	Brazil	**N**	**NE**	**MW**	**SE**	**S**
All Causes	176,402	19,074	54,500	13,361	67,745	21,722
1st	External causes 82,741	External causes 6,749	External causes 21,096	External causes 7,123	External causes 36,302	External causes 11,471
2nd	Poorly Defined 16,298	Poorly Defined 3,292	Poorly Defined 8,045	Neoplasms 1,058	Neoplasms 5,460	Neoplasms 2,057
3rd	Respiratory Tract 14,786	Infectious and Parasitic 2,159	Respiratory Tract 5,219	Respiratory Tract 996	Respiratory Tract 5,208	Nervous System 1,512
4th	Neoplasms 13,554	Respiratory Tract 1,931	Infectious and Parasitic 4,601	Infectious and Parasitic 920	Infectious and Parasitic 3,988	Respiratory Tract 1,432
5th	Infectious and Parasitic 12,910	Neoplasms 1,231	Neoplasms 3,748	Nervous System 748	Nervous System 3,891	Infectious and Parasitic 1,242
6th	Nervous System 9,313	Circulatory System 703	Nervous System 2,531	Congenital Malformations 519	Poorly Defined 3,764	Congenital Malformations 1,141
7th	Circulatory System 6,522	Nervous System 631	Circulatory System 2,387	Circulatory System 470	Congenital Malformations 2,435	Poorly Defined 742
8th	Congenital Malformations 6,082	Endocrinal Diseases 533	Endocrinal Diseases 1,544	Poorly Defined 455	Circulatory System 2,372	Circulatory System 590
9th	Endocrinal Diseases 4,022	Congenital Malformations 473	Congenital Malformations 1,514	Endocrinal Diseases 376	Endocrinal Diseases 1,110	Endocrinal Diseases 459
10th	Digestive System 3,022	Digestive System 430	Digestive System 1,056	Digestive System 212	Digestive System 1,007	Digestive System 317

Source: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM

Table 71. Percentage of death by poorly defined causes, Brazil and Regions, 1979 to 2005

Region	Brazil	North	Northeast	Middle West	Southeast	South
1979	20.1	26.0	45.7	16.7	10.0	14.8
1980	21.5	26.9	48.6	16.3	9.6	15.1
1981	21.1	25.4	47.6	18.5	9.1	14.6
1982	20.6	26.2	46.3	19.4	8.8	13.8
1983	21.5	26.8	48.0	18.8	8.9	14.1
1984	22.5	27.7	50.4	18.2	8.8	14.1
1985	21.1	27.5	46.9	18.6	9.5	13.5
1986	20.4	27.2	45.6	17.7	9.0	12.5
1987	19.8	26.7	45.2	17.8	8.6	12.5
1988	19.2	27.0	44.3	17.0	8.4	11.8
1989	18.4	27.7	42.2	14.3	8.3	12.5
1990	18.2	28.6	42.1	12.4	8.7	12.0
1991	18.2	28.6	41.2	12.6	9.3	10.6
1992	17.8	28.3	39.7	13.1	9.7	9.8
1993	18.0	28.7	40.2	12.9	9.8	9.8
1994	17.0	28.3	37.0	12.9	9.8	9.5
1995	16.2	25.7	34.4	13.3	9.7	9.4
1996	15.1	24.2	32.4	10.8	9.2	8.9
1997	14.7	24.4	31.2	10.5	9.2	7.7
1998	15.1	24.3	30.5	10.6	10.0	7.7
1999	15.1	24.4	30.3	10.1	10.1	7.1
2000	14.3	24.0	28.4	8.5	9.8	6.3
2001	14.1	22.7	27.5	7.9	9.6	6.3
2002	13.7	21.6	26.8	6.6	9.2	6.3
2003	13.3	21.2	25.9	5.7	8.9	6.7
2004	12.4	20.8	23.7	5.8	8.5	6.2
2005	10.4	17.7	17.2	5.2	8.1	5.8

Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MS/INCA/Conprev/Divisão de Informação

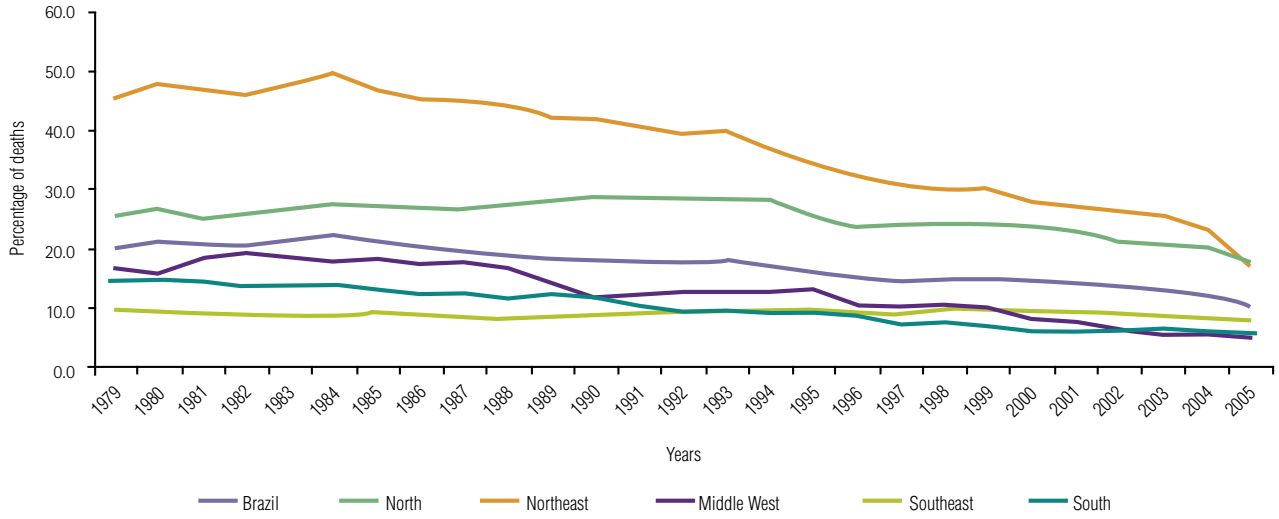

Figure 68. Percentage of deaths by poorly defined causes, Brazil and Regions, 1979 to 2005

Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MS/INCA/Conprev/Divisão de Informação

Table 72. Average mortality rates by type of cancer, specific, crude and age-adjusted* rates, per million children and adolescents, Brazil and Regions, 2001 to 2005

Brazil and Regions	Age Group	Sex	BRAZIL	North	Northeast	Middle West	Southeast	South
Specific Coefficient	0	Total	39.99	35.92	41.22	58.08	39.40	32.52
		Male	41.55	38.76	43.75	56.15	42.47	28.42
		Female	38.37	32.98	38.60	60.08	36.21	36.80
	1-4	Total	45.49	43.88	41.44	48.23	46.96	50.26
		Male	49.32	49.53	45.47	52.70	49.54	55.44
		Female	41.50	38.05	37.18	43.59	44.29	44.88
	5-9	Total	37.32	32.01	32.91	47.70	38.85	41.30
		Male	40.25	37.96	35.92	53.75	41.09	42.15
		Female	34.29	25.85	29.81	41.45	36.53	40.42
	10-14	Total	33.95	29.13	27.53	39.45	37.44	39.40
		Male	37.22	30.90	31.68	43.73	40.26	42.25
		Female	30.59	27.33	23.31	35.03	34.54	36.45
	15-18	Total	45.44	40.51	39.89	47.85	47.71	53.51
		Male	52.62	38.46	47.55	56.99	56.32	60.42
		Female	38.17	42.59	32.11	38.71	39.04	46.39
Rates per million	Crude	Total	40.03	35.82	35.12	46.19	42.16	44.87
		Male	44.10	38.83	39.67	51.72	46.10	48.22
		Female	35.84	32.73	30.45	40.51	38.13	41.41
	Adjusted*	Total	40.28	36.17	35.62	46.57	42.26	44.85
		Male	44.23	39.35	40.01	51.89	45.98	48.09
		Female	36.22	32.87	31.12	41.13	38.47	41.50

*Average World Population, modified by Doll et al. (1966)
Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

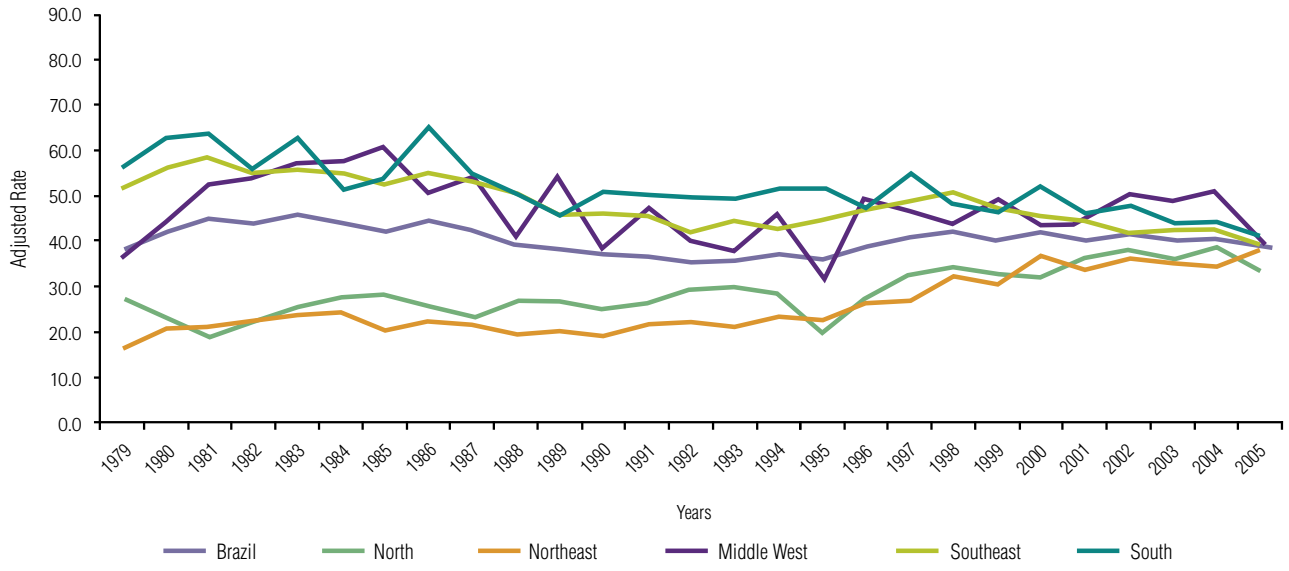

Figure 69. Mortality rates by cancer, age-adjusted, per million children and adolescents, Brazil and Regions, 1979 to 2005*

*World Standard Population, modified by Doll et al. (1966)
Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

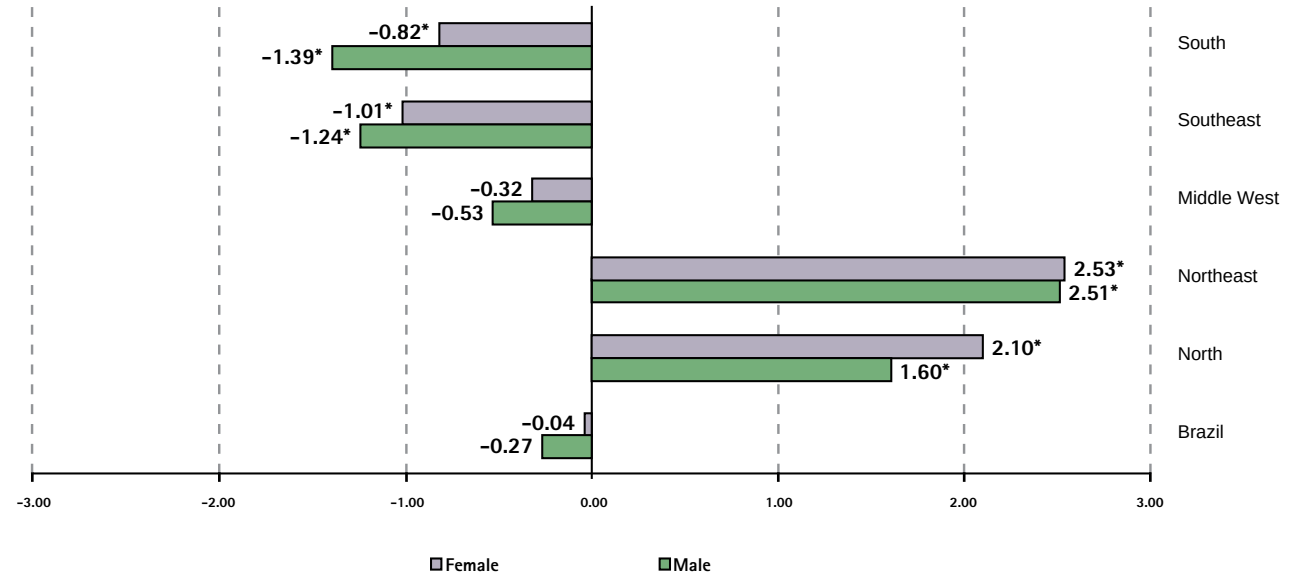

Figure 70. Estimated Annual Percentage Change (EAPC), by cancer and sex, Brazil and Regions, 1979 to 2005

* Statistically significant
Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

Table 73. Five main causes of death by cancer, sex and age range, Brazil, 2001 to 2005

1-18	< 1	1-4	5-9	10-14	15-18
Male					
All Neoplasms 7,203	All Neoplasms 356	All Neoplasms 1,728	All Neoplasms 1,769	All Neoplasms 1,707	All Neoplasms 1,999
Leukemia 2,539	Leukemia 117	Leukemia 533	Leukemia 648	Leukemia 641	Leukemia 717
CNS 1,619	CNS 89	CNS 400	CNS 494	CNS 404	CNS 321
Lymphatic Tissue 722	Kidney 15	Lymphatic Tissue 134	Lymphatic Tissue 192	Lymphatic Tissue 194	Bone 255
Bone 461	Muscle 7	Kidney 101	Muscle 61	Bone 148	Lymphatic Tissue 202
Muscle 264	Eye 6	Eye 91	Kidney 59	Muscle 64	Muscle 78
Female					
All Neoplasms 5,669	All Neoplasms 317	All Neoplasms 1,406	All Neoplasms 1,460	All Neoplasms 1,370	All Neoplasms 1,433
Leukemia 1,897	Leukemia 110	Leukemia 479	Leukemia 510	Leukemia 456	Leukemia 452
CNS 1,370	CNS 79	CNS 346	CNS 453	CNS 340	CNS 231
Bone 428	Kidney 11	Kidney 84	Kidney 86	Bone 178	Bone 190
Lymphatic Tissue 362	Bone 8	Lymphatic Tissue 82	Lymphatic Tissue 77	Lymphatic Tissue 78	Lymphatic Tissue 125
Kidney 209	Muscle 7	Eye 49	Muscle 49	Muscle 58	Muscle 55

Other locations were excluded when organizing causes of death
Source: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM

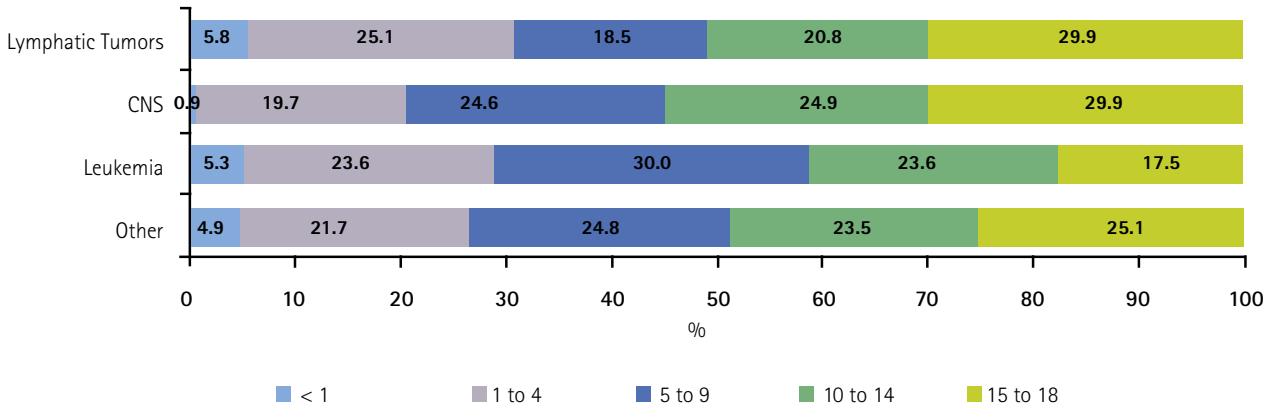

Figure 71. Percentage distribution of mortality by type of cancer and age-group, Brazil, 2001 to 2005

Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

Table 74. Average mortality of leukemia in specific, crude and age-adjusted rates, per million children and adolescents, Brazil and Regions, 2001 to 2005*

Brazil and Regions	Age Group	Sex	BRAZIL	North	Northeast	Middle West	Southeast	South
Specific Coefficient	0	Total	13.49	17.38	15.67	12.63	12.67	8.35
		Male	13.65	21.66	14.84	8.26	13.05	9.47
		Female	13.32	12.96	16.54	17.17	12.28	7.18
	1-4	Total	14.68	19.55	12.25	12.82	14.65	17.58
		Male	15.21	21.86	13.19	12.78	14.51	17.99
		Female	14.14	17.17	11.27	12.87	14.79	17.16
	5-9	Total	13.38	14.09	11.13	17.14	13.99	14.26
		Male	14.74	16.47	12.62	21.63	15.04	13.83
		Female	11.98	11.62	9.61	12.50	12.89	14.71
	10-14	Total	12.10	12.42	10.16	12.94	12.74	14.10
		Male	13.98	13.44	12.36	15.42	14.70	15.15
		Female	10.18	11.37	7.93	10.38	10.72	13.03
	15-18	Total	15.48	15.00	14.19	13.86	16.25	17.32
		Male	18.88	13.71	19.04	17.86	20.11	18.80
		Female	12.04	16.31	9.27	9.87	12.36	15.79
Rates per million	Crude	Total	13.78	15.22	12.00	14.19	14.24	15.27
		Male	15.50	16.59	14.20	16.66	15.89	15.90
		Female	12.02	13.81	9.74	11.66	12.54	14.62
	Adjusted*	Total	13.81	15.45	12.05	14.16	14.20	15.26
		Male	15.39	16.92	14.05	16.39	15.66	15.85
		Female	12.19	13.92	10.00	11.89	12.72	14.66

* Average World Population, modified by Doll et al. (1966)
Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

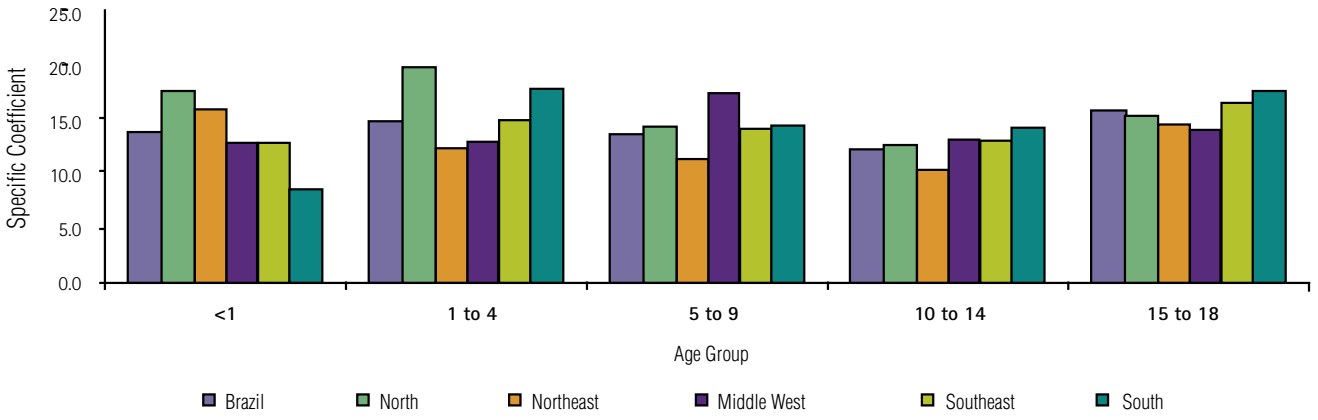

Figure 72. Distribution of age-specific mortality rates by Leukemia, per million children and adolescents, according to age group, Brazil and Regions, 2001 to 2005

Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

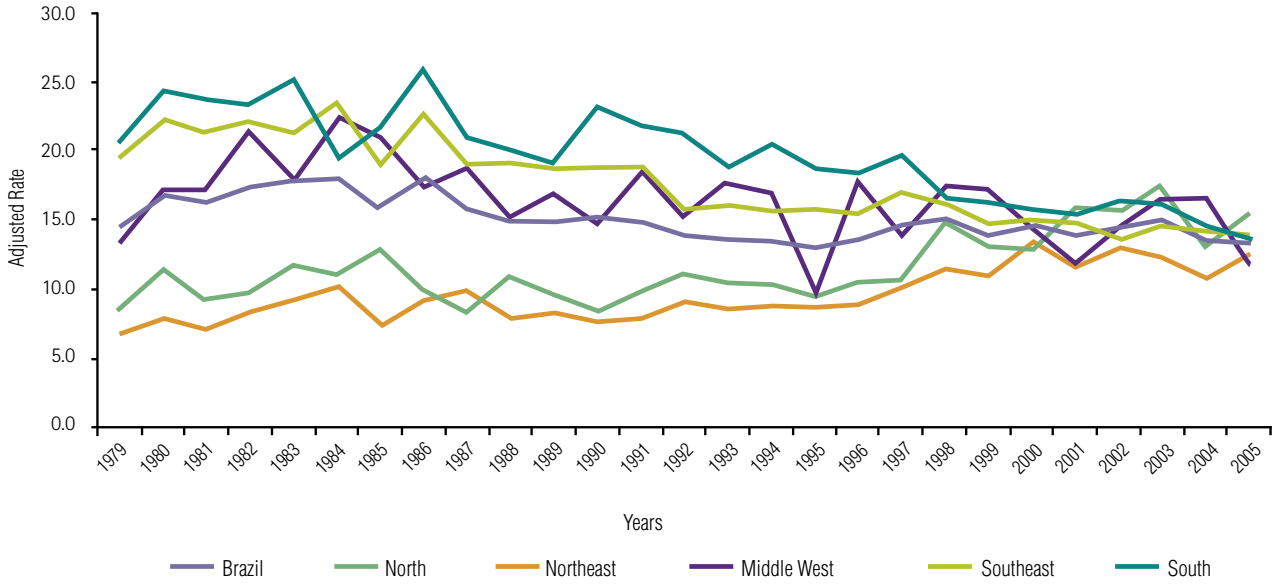

Figure 73. Average age-adjusted* mortality rates by Leukemia, per million children and adolescents, Brazil and Regions, 1979 to 2005

*World Standard Population, modified by Doll et al. (1966)
Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
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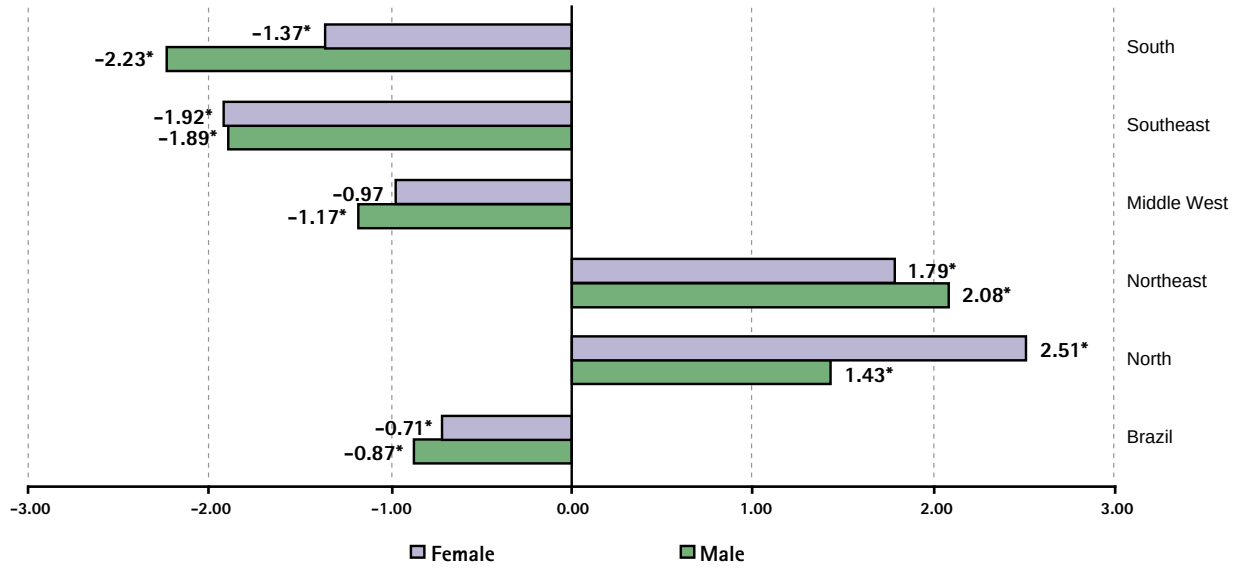

Figure 74. Estimated Annual Percentage Change (EAPC), by Leukemia and sex, Brazil and Regions, 1979 to 2005

* Statistically significant
Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

The age-adjusted mortality rates of leukemia in Brazil and regions, between 1979 and 2005, are shown in Table 74. The adjusted mortality rate for leukemia in Brazil was 13.8/ 1,000,000. The mortality rate was 15.4/ 1,000,000 in males and 12.2/ 1,000,000 in females. For the five Brazilian regions, mortality rates varied between 14.1 and 16.9/ 1,000,000 in males, and between 10 and 14.7/ 1,000,000 in females.

The highest rates were observed in the North (17 per million) for males and in the South (15 per million) for females. The Northeast presented the lowest mortality rates in both males (14 per million) and females (10 per million).

The 15 to 18 age group presented, in both males and females, the highest specific mortality rate in the country, at 15.5 deaths per million. In males, leukemia predominated in the 15 to 18 age range (19 per million). In females, the highest specific rate occurred in ages 1 to 4 (14 per million) (Table 74).

The time series analysis revealed a slight decrease from 1979 to 2005 (Figure 73). This decrease proved significant for both males (EAPC=-0.87) and females (EAPC=-0.71), both with an average decrease of approximately 1% a year (Figure 74).

When considering Brazil's geographic regions, the same behavior was observed in the Southeast, South, and Middle West. In the North and Northeast, there was an increasing trend (Figure 73). The decrease observed in the Middle West, Southeast and South was significant in males (EAPC= -1.17; -1.89; -2.23, respectively). A similar pattern was observed in girls. The North and Northeast regions presented a significant increase in rates for both sexes (approximately 2% a year) (Figure 74).

HODGKIN'S DISEASE

Table 75. Average mortality of Hodgkin's disease, in specific, crude and age-adjusted rates, per million children and adolescents, Brazil and Regions, 2001 to 2005*

Brazil and Regions	Age Group	Sex	BRAZIL	North	Northeast	Middle West	Southeast	South
Specific Coefficient	0	Total	0.12	0.00	0.19	0.00	0.00	0.44
		Male	0.12	0.00	0.38	0.00	0.00	0.00
		Female	0.12	0.00	0.00	0.00	0.00	0.90
	1-4	Total	0.13	0.28	0.19	0.00	0.08	0.11
		Male	0.14	0.28	0.28	0.00	0.00	0.21
		Female	0.12	0.29	0.10	0.00	0.15	0.00
	5-9	Total	0.25	0.35	0.19	0.32	0.33	0.08
		Male	0.34	0.69	0.30	0.64	0.30	0.16
		Female	0.16	0.00	0.08	0.00	0.37	0.00
	10-14	Total	0.50	0.48	0.70	0.32	0.37	0.49
		Male	0.68	0.24	1.10	0.63	0.40	0.80
		Female	0.31	0.73	0.28	0.00	0.35	0.16
	15-18	Total	0.98	0.60	0.77	0.57	1.24	1.17
		Male	0.97	0.89	0.85	0.76	1.00	1.34
		Female	0.99	0.30	0.69	0.38	1.48	0.99
Rates per million	Crude	Total	0.45	0.40	0.46	0.29	0.48	0.45
		Male	0.52	0.49	0.64	0.50	0.41	0.60
		Female	0.38	0.31	0.27	0.09	0.56	0.31
	Adjusted*	Total	0.41	0.39	0.42	0.27	0.43	0.41
		Male	0.48	0.47	0.59	0.46	0.36	0.54
		Female	0.34	0.30	0.24	0.07	0.50	0.28

*World Standard Population, modified by Doll et al. (1966)

Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

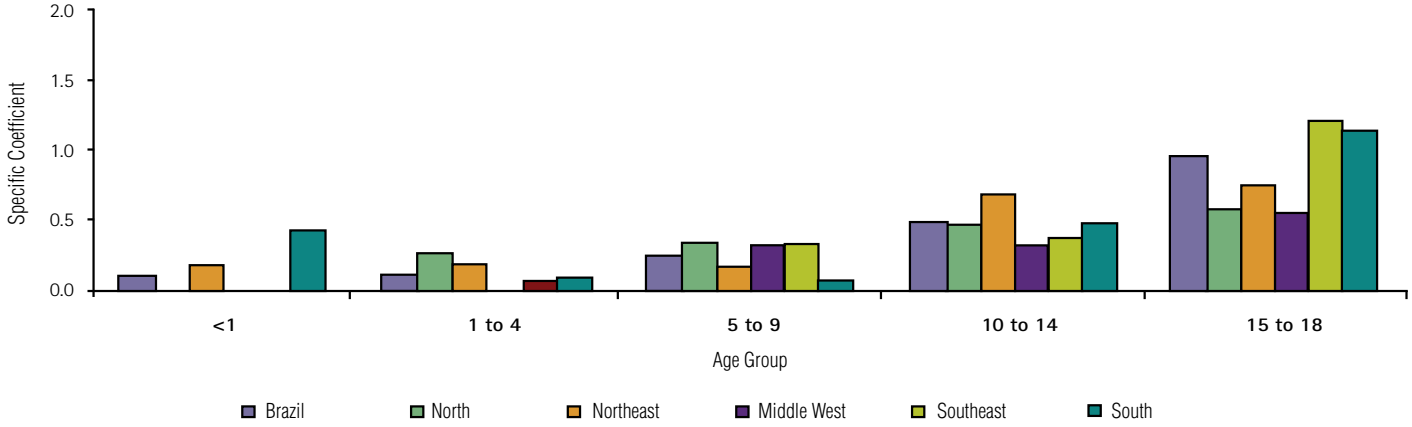

Figure 75. Distribution of age-specific mortality rates by Hodgkin's Disease, per million children and adolescents, according to age group, Brazil and Regions, 2001 to 2005

Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

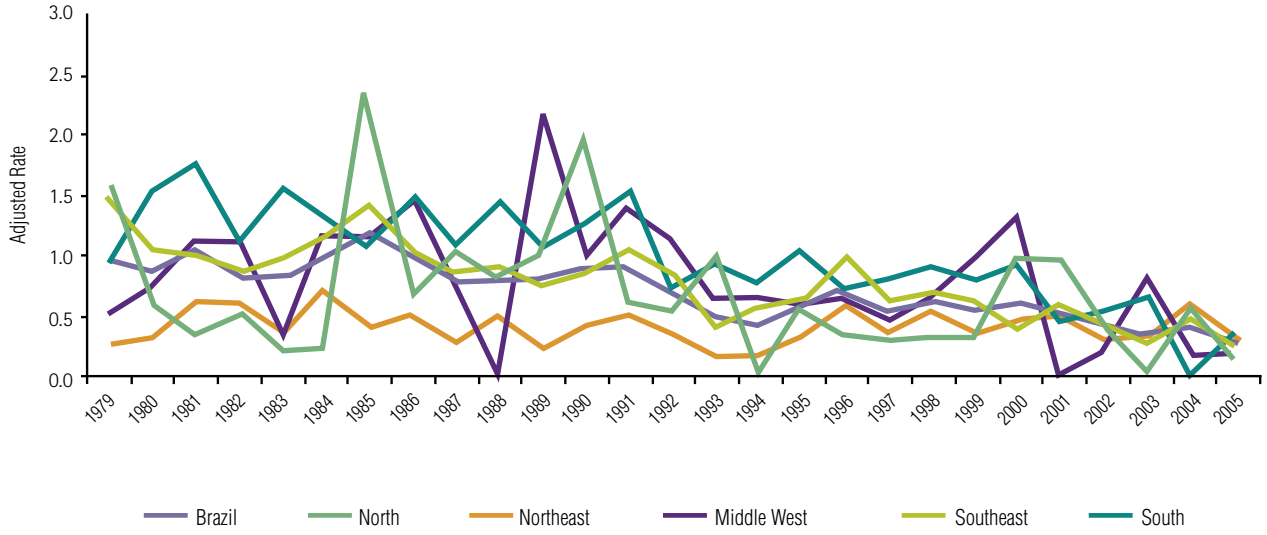

Figure 76. Average age-adjusted* mortality rates by Hodgkin's Disease, per million children and adolescents, Brazil and Regions, 1979 to 2005

*World Standard Population, modified by Doll et al. (1966)
Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
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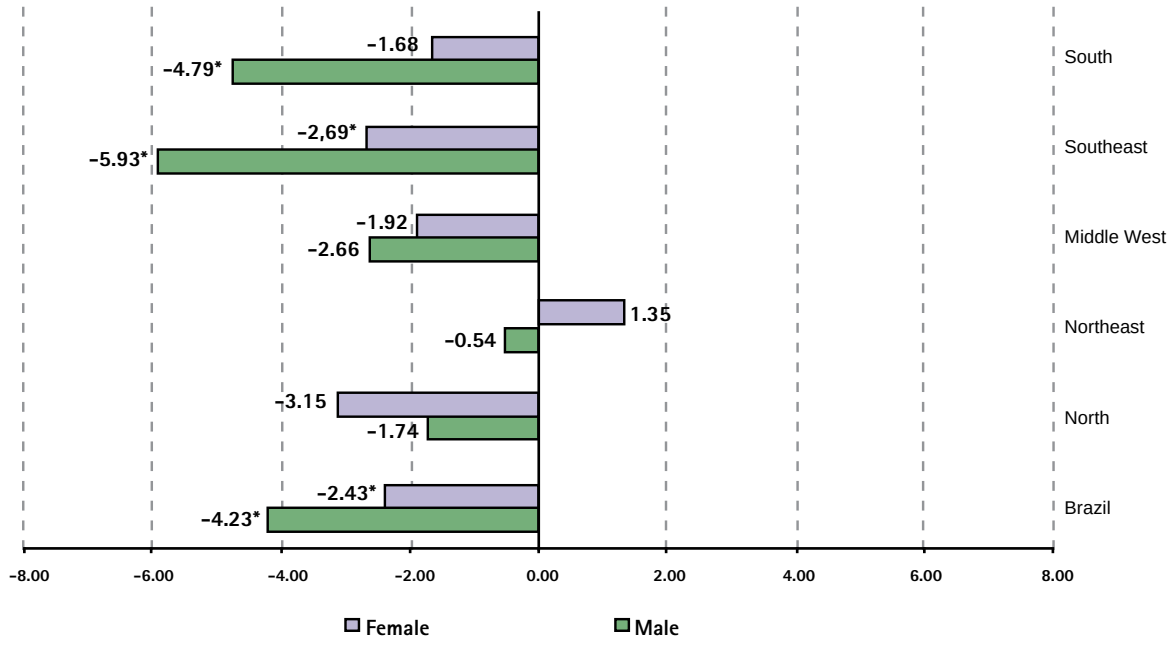

Figure 77. Estimated Annual Percentage Change (EAPC), by Hodgkin's Disease and sex, Brazil and Regions, 1979 to 2005

* Statistically significant
Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

The age-adjusted mortality rates[c] of Hodgkin's disease in Brazil and respective geographic regions, between 1979 and 2005, are shown in Table 75. The age-adjusted mortality rate for Hodgkin's disease in Brazil, in both sexes, was 0.4/ 1,000,000. Similar results were also observed in different geographic regions.

The highest age-specific rates were observed in the 15 to 18 age group, both in Brazil and within its geographic regions (Table 75 and Figure 75).

The time series analysis of mortality rates from Hodgkin's disease shows there to be a considerable decrease between 1979 and 2005 for Brazil and regions (Figure 76). The EAPC analysis gives evidence to this behavior. In general, all regions, for both boys and girls, reveal rate decreases. One notes significant variations when considering the rates for boys in Brazil, the Southeast and South (EAPC= -4.23; -5.93; -4.79, respectively), with a mortality rate reduction of approximately 5% a year. In girls, the decreasing trend was only significant throughout Brazil (Figure 77).

c Rates per million, ajusted for World Standard Population, 1966.

Table 76. Average mortality of Non-Hodgkin Lymphoma, in specific, crude and age-adjusted* rates, per million children and adolescents, Brazil and Regions, 2001 to 2005

Brazil and Regions	Age Group	Sex	BRAZIL	North	Northeast	Middle West	Southeast	South
Specific Coefficient	0	Total	0.48	0.58	0.77	0.00	0.15	0.88
		Male	0.58	1.14	0.76	0.00	0.00	1.72
		Female	0.36	0.00	0.79	0.00	0.31	0.00
	1-4	Total	3.00	2.81	3.75	3.46	2.49	2.70
		Male	3.68	4.15	4.30	5.19	2.81	3.60
		Female	2.30	1.43	3.18	1.66	2.15	1.76
	5-9	Total	2.85	4.54	3.20	2.59	2.39	2.32
		Male	4.03	6.17	4.53	4.13	3.45	2.93
		Female	1.64	2.85	1.83	0.99	1.29	1.69
	10-14	Total	2.50	1.91	1.84	3.19	2.92	2.92
		Male	3.55	2.36	2.42	4.40	4.52	3.83
		Female	1.43	1.45	1.26	1.95	1.28	1.98
	15-18	Total	3.35	3.00	2.94	3.80	3.22	4.67
		Male	4.34	2.98	3.55	5.70	4.34	6.33
		Female	2.34	3.02	2.32	1.90	2.08	2.96
Rates per million	Crude	Total	2.78	2.96	2.76	3.07	2.63	3.01
		Male	3.73	3.83	3.50	4.56	3.64	4.00
		Female	1.81	2.06	2.00	1.53	1.59	1.98
	Adjusted*	Total	2.75	2.95	2.82	3.02	2.55	2.91
		Male	3.67	3.85	3.55	4.50	3.49	3.87
		Female	1.81	2.02	2.06	1.49	1.59	1.91

*World Standard Population, modified by Doll et al. (1966)

Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

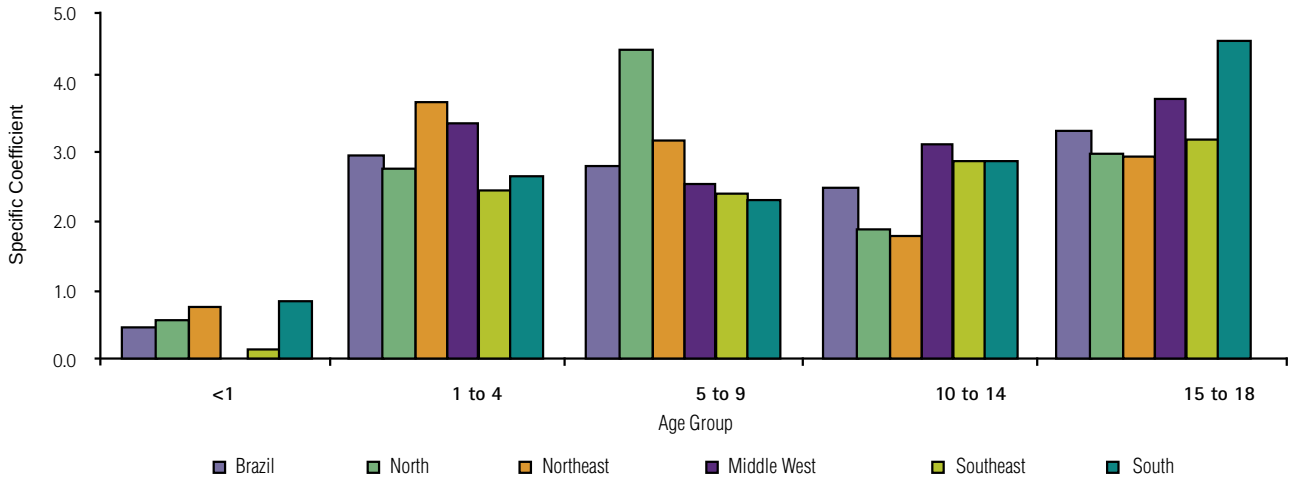

Figure 78. Distribution of age-specific mortality rates by Non-Hodgkin Lymphoma, per million children and adolescents, according to age group, Brazil and Regions, 2001 to 2005

Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

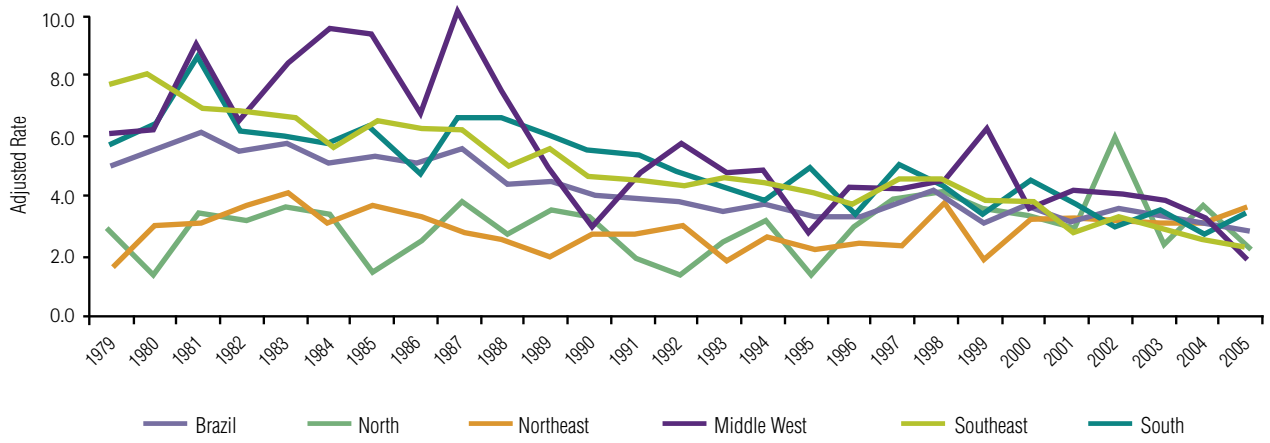

Figure 79. Average age-adjusted* mortality rates from Non-Hodgkin Lymphoma, per million children and adolescents, Brazil and Regions, 1979 to 2005

*World Standard Population, modified by Doll et al. (1966)
Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
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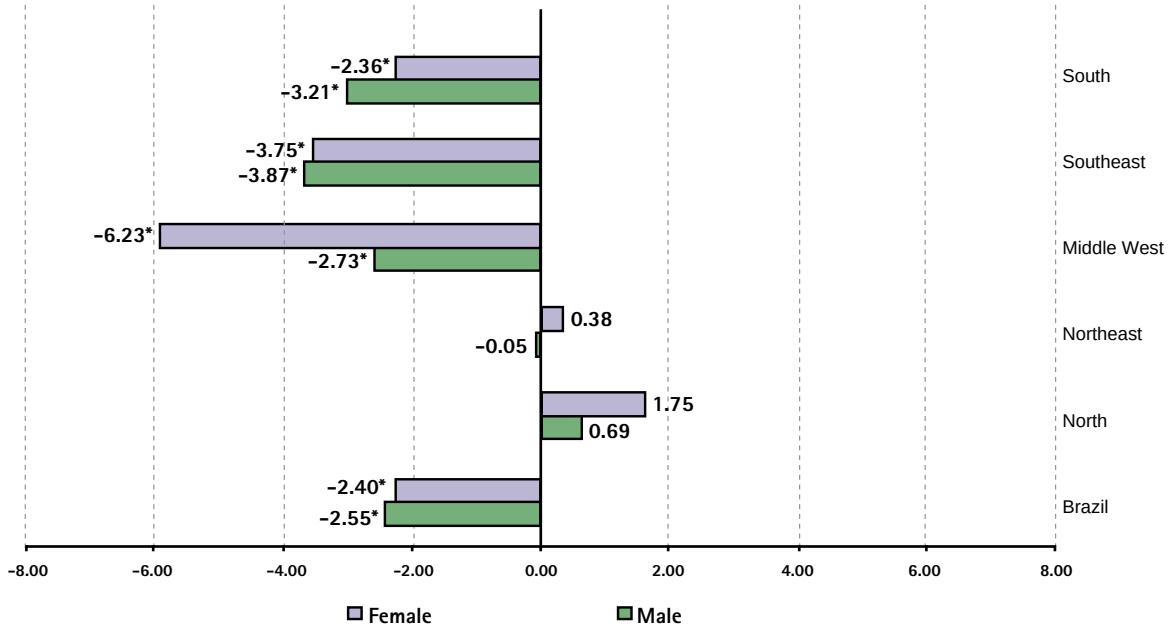

Figure 80. Estimated Annual Percentage Change (EAPC), Non-Hodgkin Lymphoma and sex, Brazil and Regions, 1979 to 2005

* Statistically significant
Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

The age-adjusted mortality rates[c] of non-Hodgkin lymphoma in Brazil and respective geographic regions, between 1979 and 2005, are shown in Table 76. In Brazil, there were approximately 4 deaths per million boys and approximately 2 deaths per million girls. For the five regions, the mortality rates varied from 3 to 4.5/ 1,000,000 in boys and 1.5 to 2.1/ 1,000,000 in girls. The highest rates were observed in boys of the Middle West region (5 per million) and in girls of the Northeast (2 per million), while the

c Rates per million, ajusted for World Standard Pupulation, 1966

lowest rates were found in boys of the Southeast (3 per million) and girls of the Middle West region (1 per million).

The highest mortality rate in Brazil, in both sexes, occurred in the 15-18 age range, at 3.3 per million. The same behavior was observed in the Middle West, Southeast and South. The highest specific rate was observed in the 1-4 age range in the Northeast, and 5-9 age range in the North (Table 76 and Figure 78).

The time series analysis revealed a mortality rate reduction in Brazil from 1979 to 2005. The EAPC analysis showed a significant rate reduction in the country's male and female population (EAPC = -2.55; -2.40, respectively). The time series of the regions showed that, with the exception of the North and Northeast, the decreasing trend in regions was similar to that of Brazil. The same pattern applies to the EAPC analysis (Figures 79 and 80).

MALIGNANT CNS TUMORS

Table 77. Average mortality of malignant CNS tumors in specific, crude and age-adjusted rates, per million children and adolescents, Brazil and Regions, 2001 to 2005*

Brazil and Regions	Age Group	Sex	BRAZIL	North	Northeast	Middle West	Southeast	South
Specific Coefficient	0	Total	9.98	4.63	7.16	18.52	12.21	9.67
		Male	10.39	6.84	7.23	16.51	13.35	8.61
		Female	9.56	2.36	7.09	20.60	11.02	10.77
	1-4	Total	10.82	6.89	9.07	12.41	12.47	12.30
		Male	11.42	7.19	9.36	15.57	12.52	13.97
		Female	10.21	6.58	8.77	9.13	12.41	10.56
	5-9	Total	10.94	5.47	8.43	16.33	12.23	14.10
		Male	11.24	6.63	8.76	16.22	12.01	15.30
		Female	10.64	4.27	8.08	16.45	12.46	12.85
	10-14	Total	8.21	5.37	6.54	10.38	9.25	9.97
		Male	8.81	6.37	7.46	10.70	9.39	11.00
		Female	7.59	4.35	5.62	10.05	9.10	8.91
	15-18	Total	7.31	4.65	5.71	8.35	7.71	10.99
		Male	8.45	5.37	7.02	9.50	8.42	13.23
		Female	6.15	3.93	4.38	7.21	6.99	8.69
Rates per million	Crude	Total	9.33	5.54	7.37	12.30	10.45	11.73
		Male	9.96	6.44	8.06	13.18	10.67	13.10
		Female	8.68	4.62	6.66	11.41	10.22	10.31
	Adjusted*	Total	9.52	5.60	7.55	12.58	10.73	11.81
		Male	10.13	6.49	8.18	13.51	10.93	13.14
		Female	8.90	4.68	6.91	11.62	10.54	10.43

*World Standard Population, modified by Doll et al. (1966)

Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

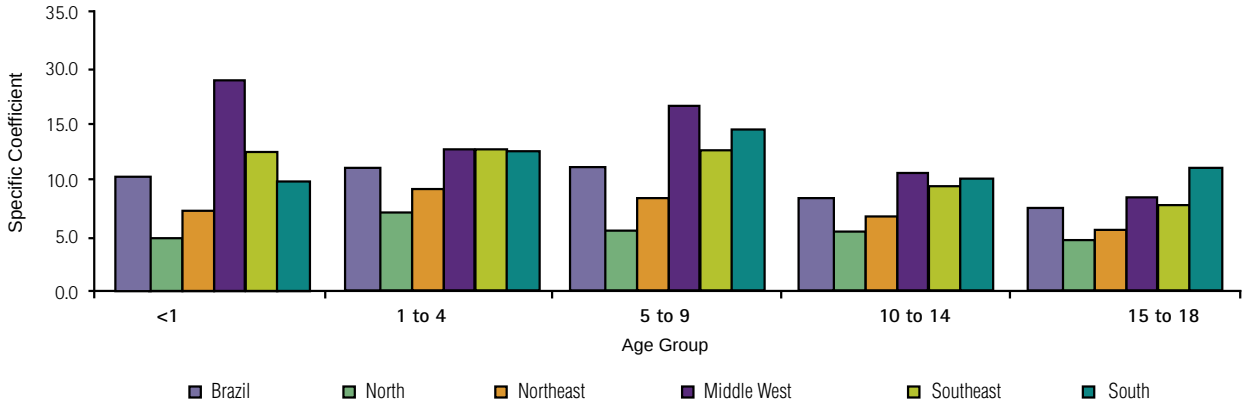

Figure 81. Distribution of age-specific mortality rates by Malignant CNS Tumor, per million children and adolescents, according to age group, Brazil and Regions, 2001 to 2005

Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

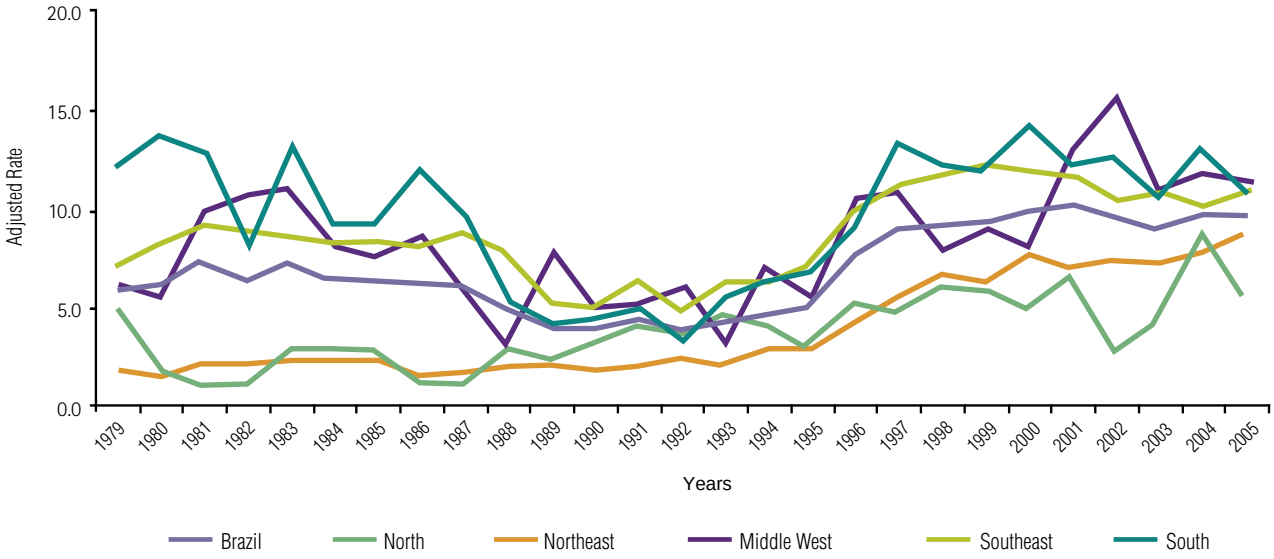

Figure 82. Average age-adjusted* mortality from rates Malignant CNS Tumor, per million children and adolescents, Brazil and Regions, 1979 to 2005

*World Standard Population, modified by Doll et al. (1966)
Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

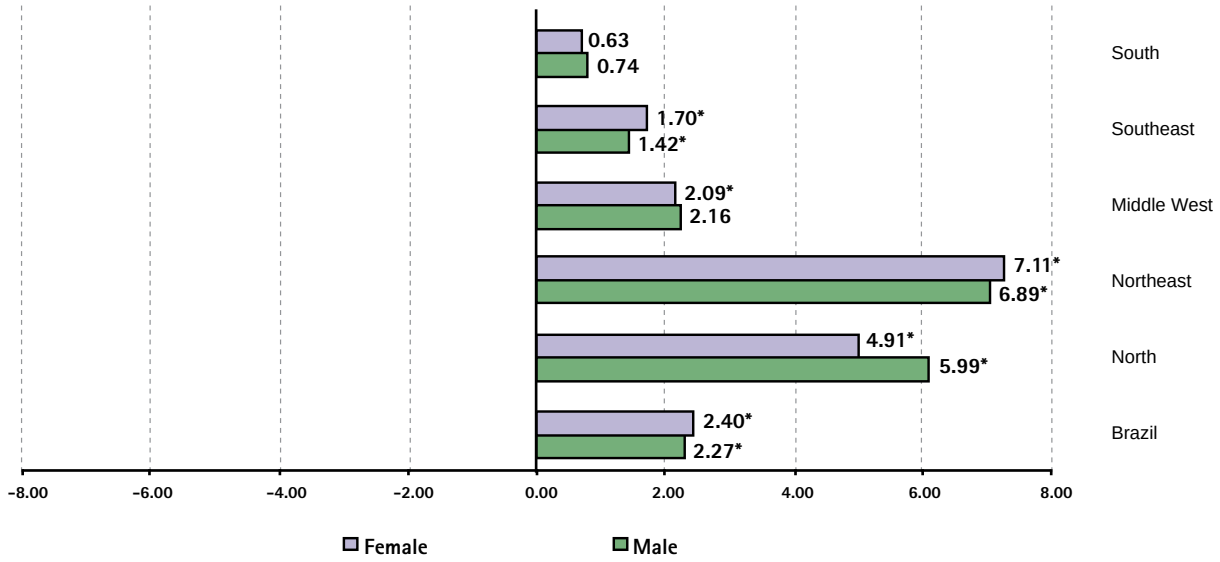

Figure 83. Estimated Annual Percentage Change (EAPC), Malignant CNS Tumor and sex, Brazil and Regions, 1979 to 2005

* Statistically significant
Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

The age-adjusted mortality rates[c] of central nervous system (CNS) tumors in Brazil and respective geographic regions, between 1979 and 2005, are shown in Table 77. In Brazil, the adjusted mortality rate was 9.5/ 1,000,000 for both boys and girls, and there were approximately 10 deaths per million boys and approximately 9 deaths per million girls. For the five regions, the mortality rates varied from 6 to 13/ 1,000,000 in boys and 5 to 12/ 1,000,000 in girls. The Middle West region presented the highest mortality rates in both boys (13 per million) and the Northeast presented the highest rates in girls (12 per million). The lowest rates were found in the North, both for males and females (6 and 5 per million, respectively).

The 5-9 age group presented, in both sexes, the highest specific mortality rate in Brazil and in the South (10.9 and 14.1 per million, respectively). In the North, Northeast and Southeast, the highest rates occurred in the 1-4 age group. The Middle West presented the highest specific rate ages 0-1 (Table 77 and Figure 81).

The time series analysis of mortality rates in malignant CNS tumors increased after 1996 throughout Brazil and within regions (Figure 82). This increase may be largely attributed to changes in classification criteria of deaths from CNS tumors.

c Rates per million, adjusted for World Standard Population, 1966

Table 78. Average mortality of eye cancer in specific, crude and age-adjusted rates, per million children and adolescents, Brazil and Regions, 2001 to 2005*

Brazil and Regions	Age Group	Sex	BRAZIL	North	Northeast	Middle West	Southeast	South
Specific Coefficient	0	Total	0.48	0.00	0.58	0.84	0.46	0.44
		Male	0.70	0.00	0.76	1.65	0.61	0.86
		Female	0.24	0.00	0.39	0.00	0.31	0.00
	1-4	Total	2.03	2.95	2.28	1.42	1.77	1.83
		Male	2.60	4.70	2.81	0.80	2.44	1.90
		Female	1.45	1.14	1.73	2.08	1.07	1.76
	5-9	Total	0.55	0.70	0.83	0.49	0.30	0.58
		Male	0.50	0.69	0.82	0.64	0.24	0.33
		Female	0.61	0.71	0.84	0.33	0.37	0.85
	10-14	Total	0.14	0.00	0.10	0.48	0.17	0.08
		Male	0.22	0.00	0.14	0.94	0.23	0.16
		Female	0.07	0.00	0.07	0.00	0.12	0.00
	15-18	Total	0.13	0.00	0.21	0.38	0.10	0.00
		Male	0.11	0.00	0.17	0.00	0.13	0.00
		Female	0.16	0.00	0.26	0.76	0.07	0.00
Rates per million	Crude	Total	0.65	0.83	0.77	0.67	0.53	0.56
		Male	0.78	1.22	0.89	0.66	0.68	0.55
		Female	0.51	0.44	0.65	0.68	0.37	0.57
	Adjusted*	Total	0.74	0.93	0.89	0.72	0.61	0.66
		Male	0.90	1.36	1.03	0.69	0.79	0.66
		Female	0.58	0.47	0.75	0.75	0.43	0.66

*World Standard Population, modified by Doll et al. (1966)

Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

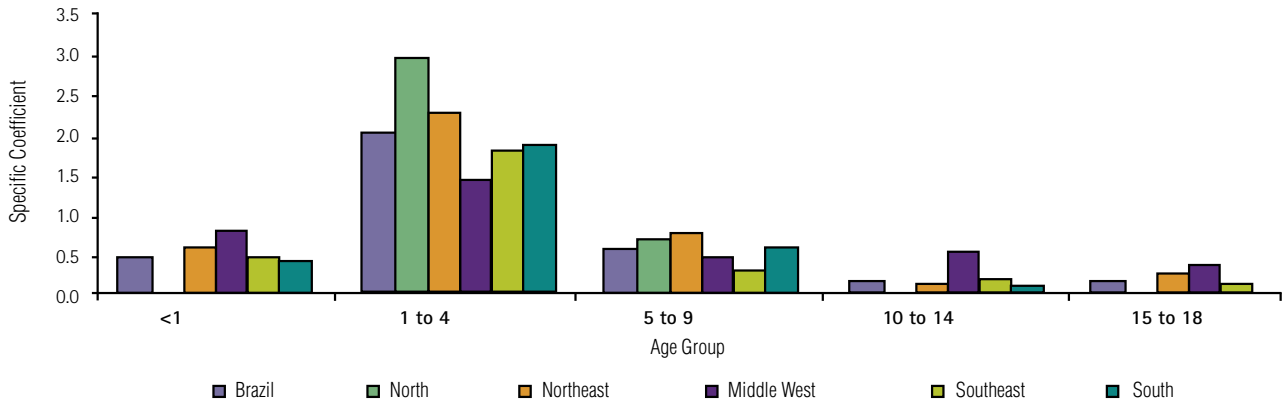

Figure 84. Distribution of age-specific mortality rates by eye cancer, per million children and adolescents, according to age group, Brazil and Regions, 2001 to 2005

Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

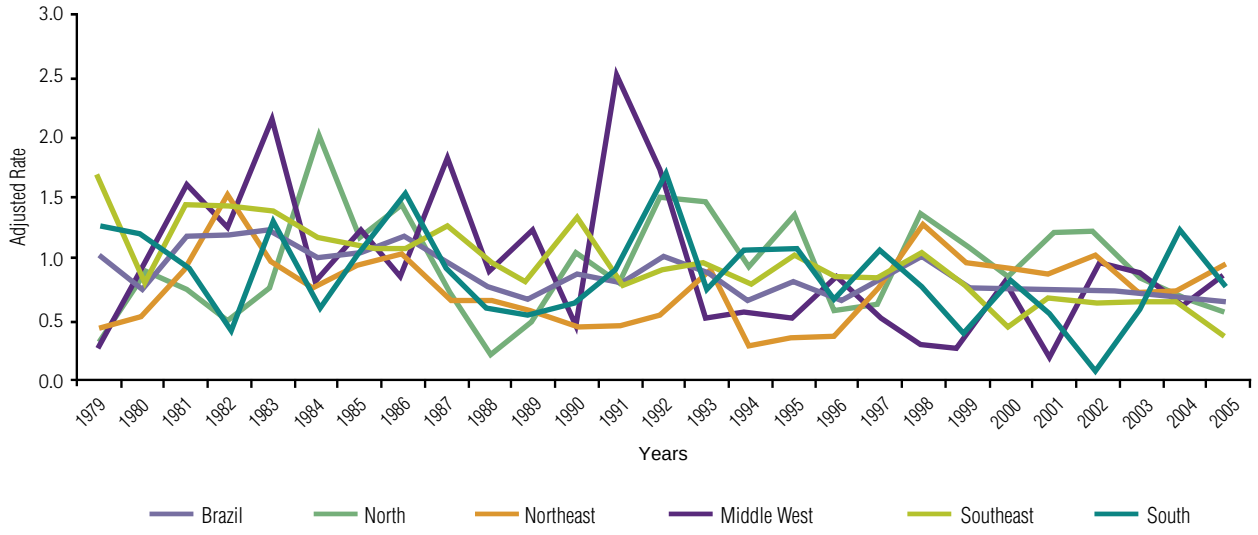

Figure 85. Average age-adjusted* mortality rates by eye cancer, per million children and adolescents, Brazil and Regions, 1979 to 2005

*World Standard Population, modified by Doll et al. (1966)
Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

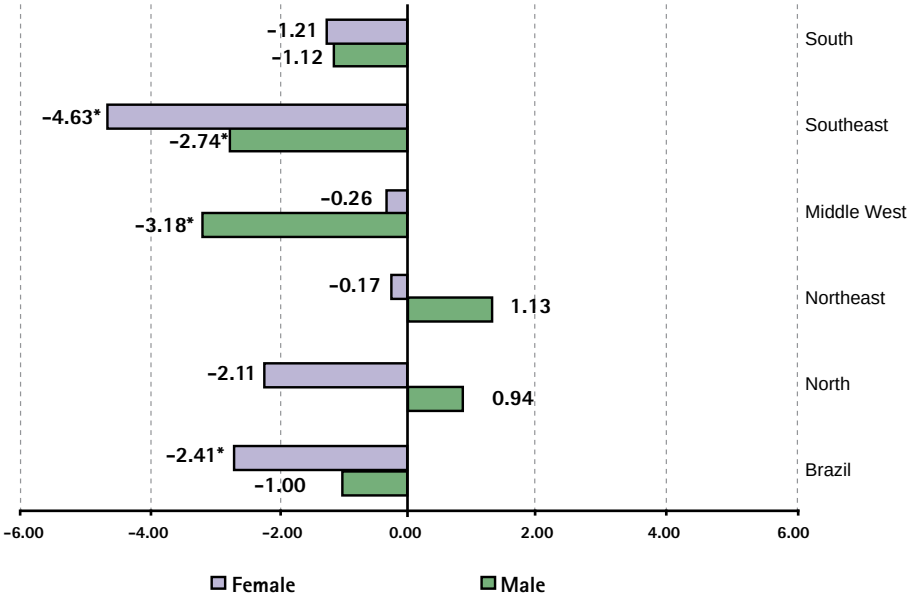

Figure 86. Estimated Annual Percentage Change (EAPC), eye cancer and sex, Brazil and Regions, 1979 to 2005

* Statistically significant
Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
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The age-adjusted mortality rates[c] of eye cancer in Brazil and regions between 1979 e 2005 can be seen in Table 78. In Brazil, we observed that the adjusted mortality rate of eye cancer is approximately 1/ 1,000,000. This pattern is similar within sex and geographic region.

The 1 to 4 age range presented the highest specific mortality rate in Brazil and regions for males and females, varying from 1.4 to 3 per million (Table 78 and Figure 84).

In Brazil, the time series analysis reveals a rate reduction between 1979 and 2005. The EAPC analysis also suggests this reduction. For Brazilian regions, the EAPC trend analysis suggests a mortality rate decrease in the South, Middle West and Southeast, but only the latter is significant (**Figures 85 and 86**).

KIDNEY CANCER

Table 79. Average mortality of kidney cancer, in specific, crude and age-adjusted rates, per million children and adolescents, Brazil and Regions, 2001 to 2005*

Brazil and Regions	Age Group	Sex	BRAZIL	North	Northeast	Middle West	Southeast	South
Specific Coefficient	0	Total	1.54	1.16	2.13	4.21	0.31	2.64
		Male	1.75	1.14	2.28	6.61	0.30	2.58
		Female	1.33	1.18	1.97	1.72	0.31	2.69
	1-4	Total	2.70	3.52	3.42	3.66	1.88	2.27
		Male	2.88	3.32	3.84	3.59	2.00	2.54
		Female	2.48	3.72	2.89	3.74	1.76	1.98
	5-9	Total	1.68	1.16	1.54	1.13	1.96	1.82
		Male	1.34	1.37	1.19	0.95	1.49	1.46
		Female	2.02	0.95	1.91	1.32	2.46	2.20
	10-14	Total	0.53	0.24	0.45	0.64	0.69	0.41
		Male	0.57	0.24	0.62	0.31	0.79	0.16
		Female	0.49	0.24	0.28	0.97	0.58	0.66
	15-18	Total	0.38	0.15	0.34	0.95	0.40	0.29
		Male	0.32	0.00	0.25	1.14	0.33	0.19
		Female	0.45	0.30	0.43	0.76	0.47	0.39
Rates per million	Crude	Total	1.28	1.23	1.38	1.64	1.17	1.23
		Male	1.24	1.22	1.41	1.66	1.09	1.11
		Female	1.32	1.25	1.33	1.62	1.25	1.37
	Adjusted*	Total	1.41	1.35	1.57	1.81	1.24	1.36
		Male	1.38	1.32	1.61	1.86	1.16	1.26
		Female	1.44	1.37	1.50	1.76	1.33	1.47

*World Standard Population, modified by Doll et al. (1966)
Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

c *Rates per million, adjusted for World Standard Population, 1966*

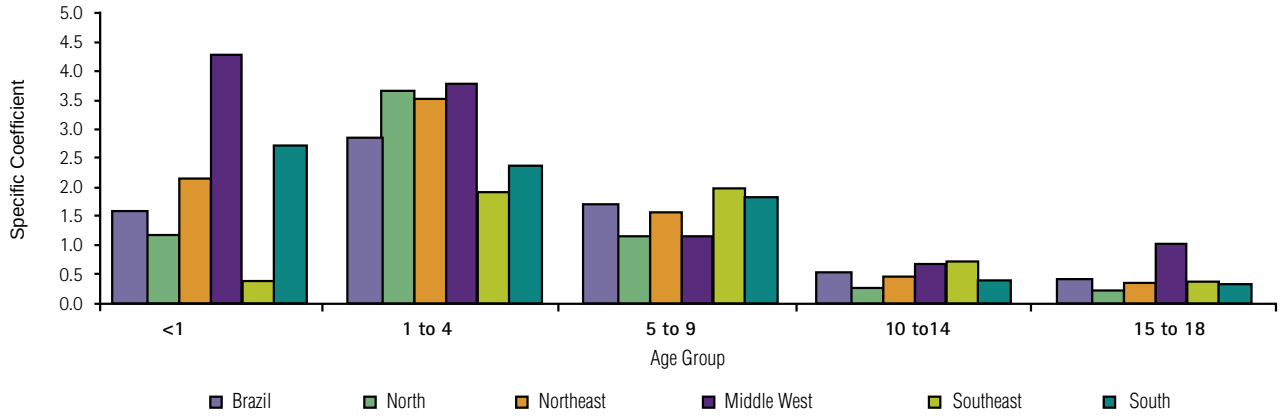

Figure 87. Distribution of age-specific mortality rates by kidney cancer, per million children and adolescents, according to age group, Brazil and Regions, 2001 a 2005

Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
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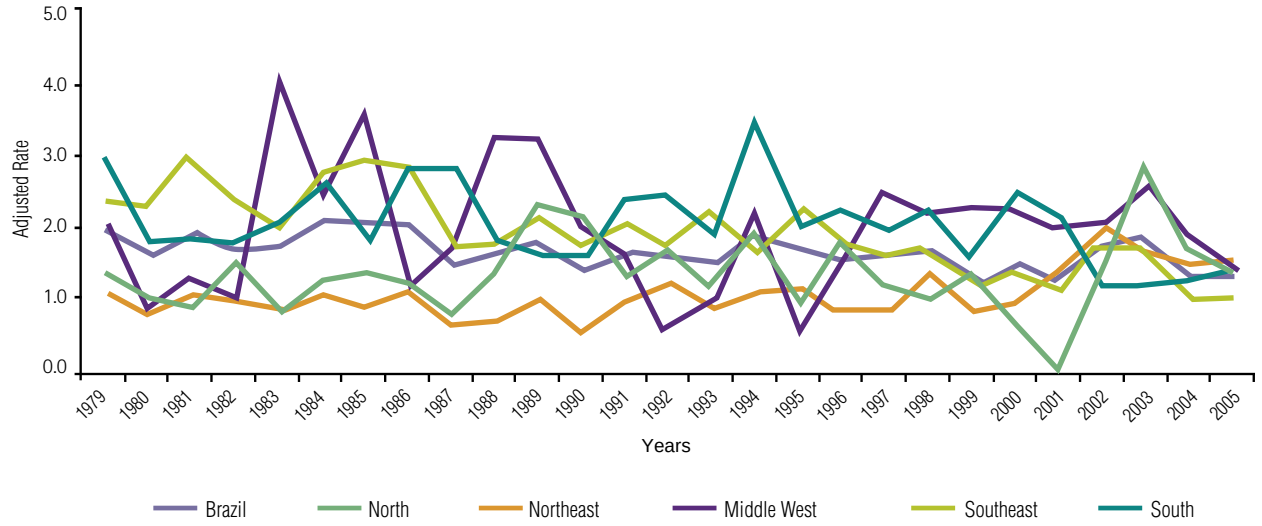

Figure 88. Average age-adjusted* mortality rates by kidney cancer, per million children and adolescents, Brazil and Regions, 1979 e 2005

*World Standard Population, modified by Doll et al. (1966)
Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

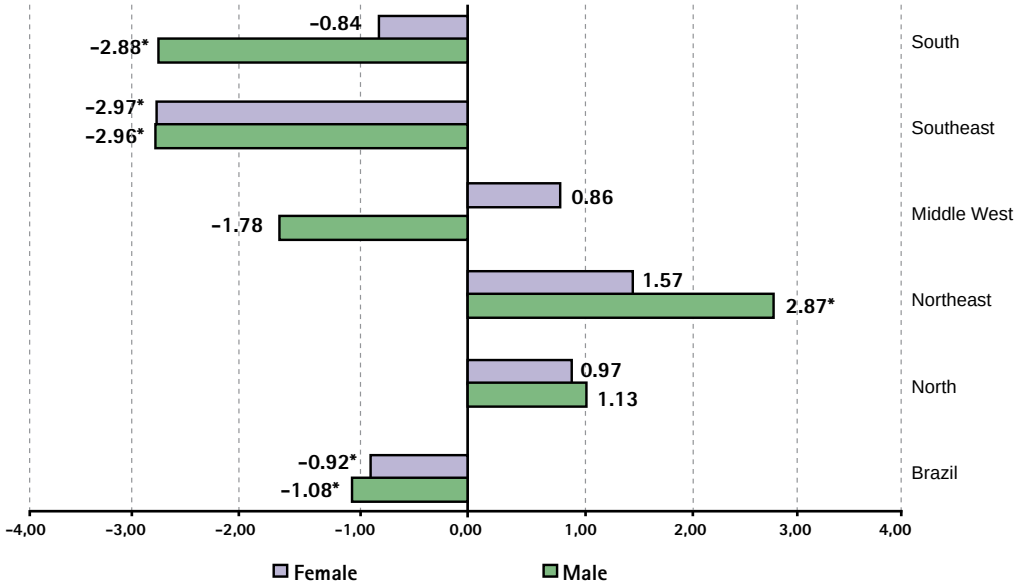

Figure 89. Estimated Annual Percentage Change (EAPC), kidney cancer and sex, Brazil and Regions, 1979 to 2005

* Statistically significant
Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

Table 79 shows the age-adjusted mortality rates[c] of malignant kidney cancer in Brazil and regions, between 1979 and 2005. Brazil presented an adjusted mortality rate of 1.41/ 1,000,000 children and adolescents. Within Brazilian regions, rates vary from 1.24 to 1.81 per million. The same pattern was observed in both males and females.

The 1-4 age range presented, in both sexes, the highest specific mortality rate throughout Brazil and within the North and Northeast. In the Middle West and South, the highest rates were found in children younger than 1 year old. In the Southeast, the most frequent age group was between ages 5-9 (Table 79 and Figure 87).

In Brazil, the mortality rate time series decreased from 1979 to 2005. This behavior was also observed in geographic regions. The EAPC analysis confirms this decrease, except for the North and Northeast regions (Figures 88 and 89).

c *Rates per million, adjusted for World Standard Population, 1966*

Table 80. Average mortality of bone cancer, in specific, crude and age-adjusted rates, per million children and adolescents, Brazil and Regions, 2001 to 2005*

Brazil and Regions	Age Group	Sex	BRAZIL	North	Northeast	Middle West	Southeast	South
Specific Coefficient	0	Total	0.53	0.00	0.77	0.84	0.31	0.88
		Male	0.12	0.00	0.38	0.00	0.00	0.00
		Female	0.97	0.00	1.18	1.72	0.63	1.79
	1-4	Total	0.54	0.56	0.38	1.42	0.45	0.65
		Male	0.54	0.83	0.56	2.00	0.30	0.21
		Female	0.53	0.29	0.19	0.83	0.61	1.10
	5-9	Total	0.94	0.23	1.02	1.46	0.97	0.91
		Male	0.89	0.23	1.11	0.95	1.01	0.49
		Female	0.99	0.24	0.92	1.97	0.92	1.35
	10-14	Total	3.60	2.03	2.58	4.79	4.06	5.11
		Male	3.23	1.89	2.14	4.09	3.56	5.26
		Female	3.97	2.18	3.02	5.51	4.58	4.95
	15-18	Total	5.89	5.40	4.60	6.65	6.53	6.91
		Male	6.71	5.66	4.82	7.22	7.88	8.06
		Female	5.06	5.13	4.38	6.07	5.17	5.73
Rates per million	Crude	Total	2.65	1.82	2.10	3.44	2.93	3.31
		Male	2.70	1.88	2.07	3.32	3.05	3.36
		Female	2.61	1.75	2.14	3.57	2.80	3.26
	Adjusted*	Total	2.37	1.70	1.88	3.17	2.57	2.96
		Male	2.40	1.78	1.87	3.08	2.66	2.94
		Female	2.34	1.61	1.90	3.28	2.49	2.99

*World Standard Population, modified by Doll et al. (1966)

Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

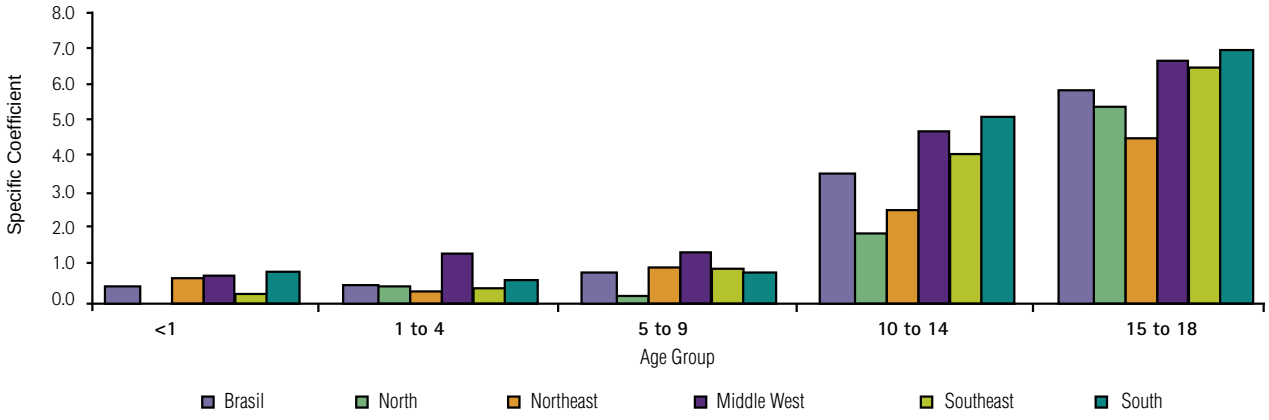

Figure 90. Distribution of age-specific mortality rates by bone cancer, per million children and adolescents, according to age group, Brazil and Regions, 2001 to 2005

Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

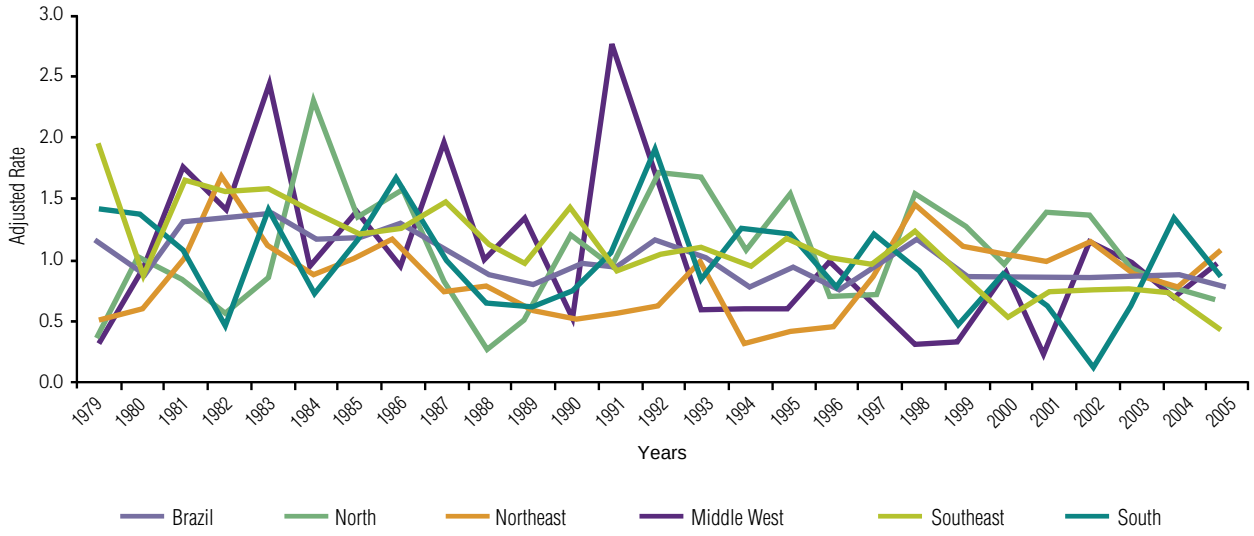

Figure 91. Average age-adjusted* mortality rates by bone cancer, per million children and adolescents, Brazil and Regions, 1979 and 2005

*World Standard Population, modified by Doll et al. (1966)
Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

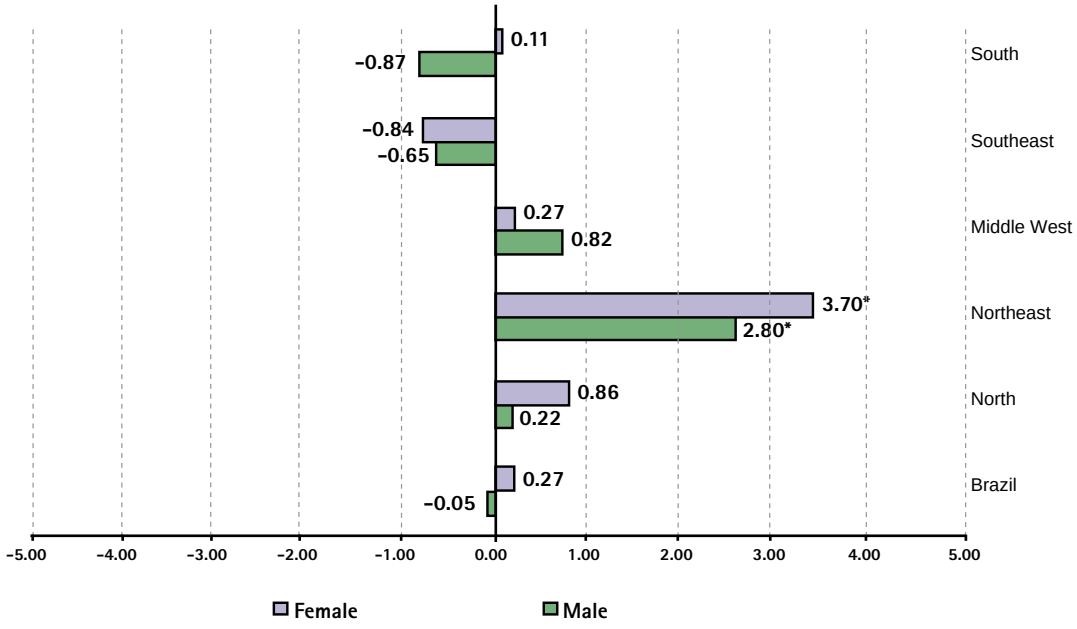

Figure 92. Estimated Annual Percentage Change (EAPC), bone cancer and sex, Brazil and Regions, 1979 to 2005

Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
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Table 80 shows the age-adjusted mortality rates[c] of malignant bone tumors in Brazil and regions, between 1979 and 2005. Brazil presented an adjusted rate of 2.4/ 1,000,000 in males and females. No rate variation was observed regarding sex. Within Brazilian regions, rates varied from 1.7 to 3.2/ 1,000,000 for both sexes. The highest incidence occurred in the Middle West region (3 per million) and the lowest occurred in the North (2 per million).

Ages 15 to 18 presented, in both sexes, the highest specific mortality rates in Brazil and geographic regions, varying from 5 to 7 per million. The same age group also presented the highest mortality rates when separated by sex (Table 80 and Figure 90).

In Brazil, the mortality time series revealed a slight decrease from 1979 to 2005. The same trend can be observed within regions. The EAPC calculations show that this decrease only occurred in boys. The Northeast was the only region that presented statistically significant EAPC values, showing a trend of increasing mortality (Figures 91 and 92).

SOFT TISSUE SARCOMA

Table 81. Average mortality of soft-tissue sarcoma in specific, crude and age-adjusted rates, per million children and adolescents, Brazil and Regions, 2001 to 2005*

Brazil and Regions	Age Group	Sex	BRAZIL	North	Northeast	Middle West	Southeast	South
Specific Coefficient	0	Total	0.83	0.58	0.58	1.68	0.62	1.76
		Male	0.82	0.00	0.76	3.30	0.61	0.86
		Female	0.85	1.18	0.39	0.00	0.63	2.69
	1-4	Total	1.48	0.56	1.38	1.63	1.51	2.27
		Male	1.74	0.00	1.68	2.00	1.93	2.54
		Female	1.21	1.14	1.06	1.25	1.07	1.98
	5-9	Total	1.27	0.70	1.24	1.46	1.24	1.74
		Male	1.39	0.69	1.48	1.27	1.31	1.95
		Female	1.15	0.71	0.99	1.64	1.17	1.52
	10-14	Total	1.35	0.96	0.80	1.12	1.80	1.70
		Male	1.40	0.47	0.90	1.57	1.98	1.43
		Female	1.30	1.45	0.70	0.65	1.62	1.98
	15-18	Total	1.76	1.20	1.11	1.90	2.18	2.33
		Male	2.05	1.19	1.18	1.52	3.01	2.11
		Female	1.47	1.21	1.03	2.28	1.34	2.57
Rates per million	Crude	Total	1.42	0.83	1.09	1.51	1.63	1.97
		Male	1.58	0.55	1.26	1.66	1.96	1.91
		Female	1.26	1.12	0.91	1.36	1.28	2.03
	Adjusted*	Total	1.41	0.81	1.10	1.52	1.58	1.98
		Male	1.57	0.52	1.29	1.70	1.90	1.94
		Female	1.24	1.12	0.91	1.33	1.25	2.02

*World Standard Population, modified by Doll et al. (1966)
Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

c *Rates per million, adjusted for World Standard Population, 1966*

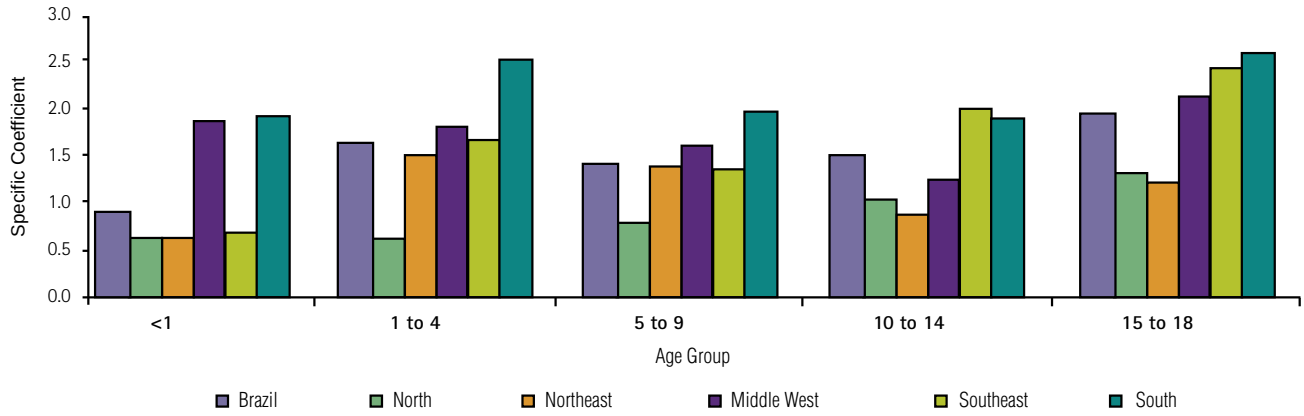

Figure 93. Distribution of age-specific mortality rates by Soft tissue sarcoma, per million children and adolescents, according to age group, Brazil and Regions, 2001 to 2005

Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

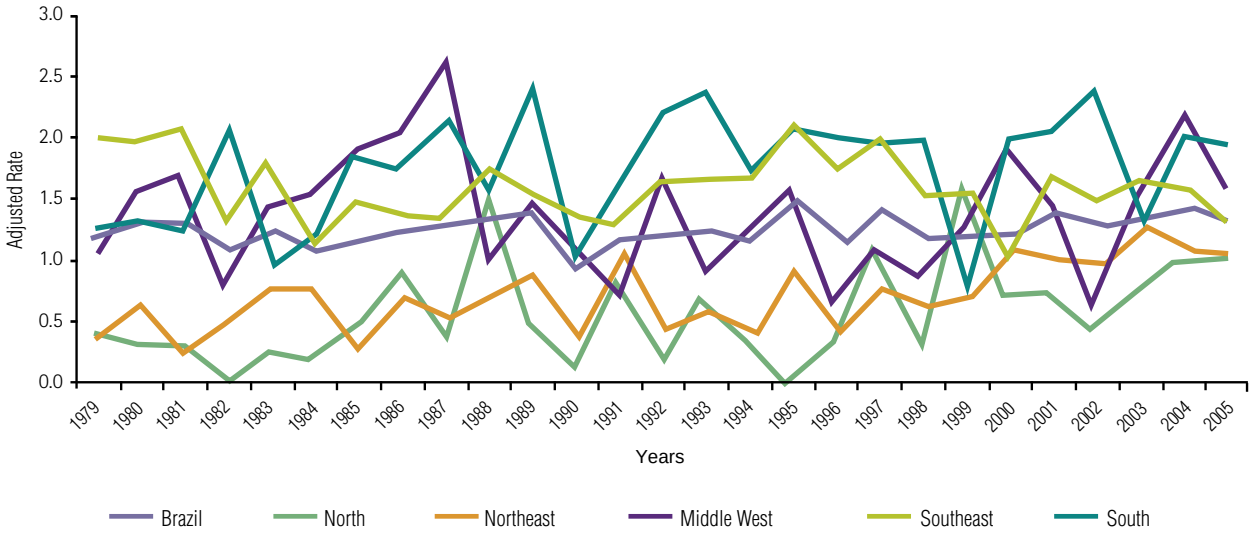

Figure 94. Average age-adjusted* mortality rates by Soft tissue sarcoma, per million children and adolescents, Brazil and Regions, 1979 to 2005

*World Standard Population, modified by Doll et al. (1966)
Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

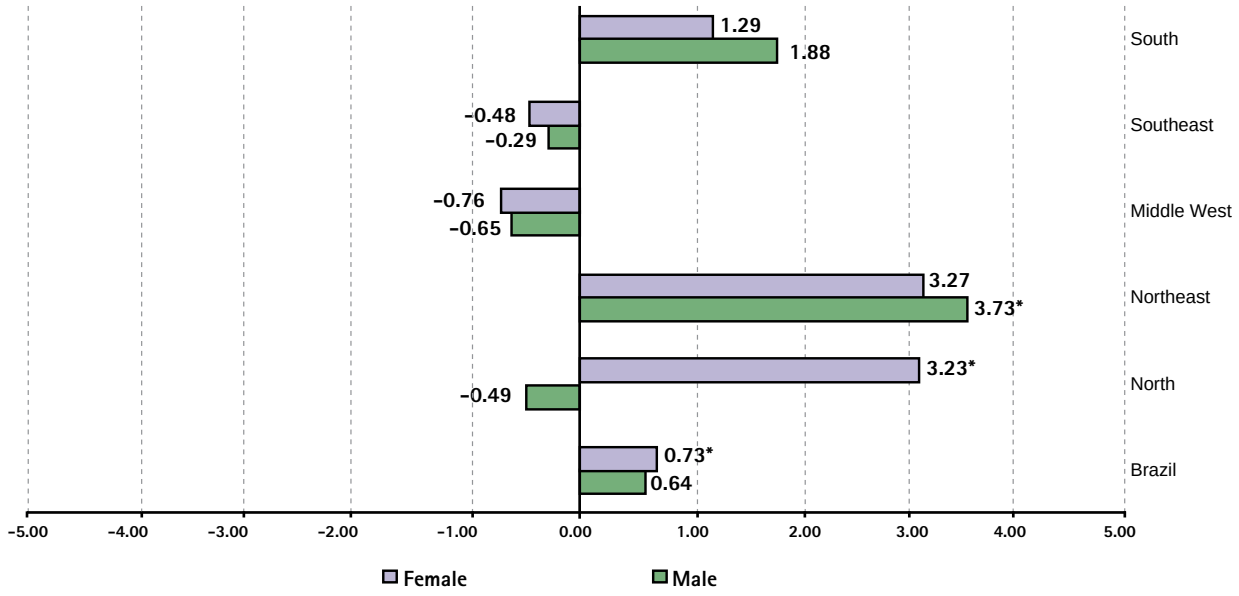

Figure 95. Estimated Annual Percentage Change (EAPC), Soft tissue sarcoma and sex, Brazil and Regions, 1979 to 2005

*Statistically significant
Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
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Table 81 shows the age-adjusted mortality rate[c] of soft tissue sarcoma in Brazil and regions, between 1979 and 2005. Brazil presented an adjusted rate of 1.41/ 1,000,000 in males and females. Within Brazilian regions, rates varied from 0.8 to 2.0/ 1,000,000 children and adolescents. The highest mortality rates for boys and girls occurred in the South and the lowest occurred in the North.

Ages 15 to 18 presented, in both sexes, the highest specific mortality rate in Brazil and geographic regions, except for the Northeast, where the highest rate occurred in ages 5-9 (Table 81 and Figure 93).

In Brazil, the mortality time series revealed a slight increase from 1979 to 2005. The EAPC calculations also show a mortality rate increase in the Northeast and South (Figures 94 and 95).

c Rates per million, adjusted for World Standard Population, 1966

Table 82. Average mortality of other types of cancer in specific, crude and age-adjusted rates, per million children and adolescents, Brazil and Regions, 2001 to 2005*

Brazil and Regions	Age Group	Sex	BRAZIL	North	Northeast	Middle West	Southeast	South
Specific Coefficient	0	Total	1.25	1.16	1.34	1.94	1.27	0.75
		Male	1.34	0.80	1.64	1.98	1.46	0.43
		Female	1.16	1.53	1.02	1.89	1.07	1.08
	1-4	Total	1.01	0.68	0.87	1.14	1.17	1.06
		Male	1.11	0.72	0.95	1.08	1.30	1.25
		Female	0.91	0.63	0.80	1.20	1.03	0.86
	5-9	Total	0.54	0.48	0.53	0.68	0.54	0.55
		Male	0.58	0.50	0.51	0.73	0.62	0.57
		Female	0.51	0.45	0.56	0.63	0.46	0.52
	10-14	Total	0.50	0.57	0.44	0.56	0.54	0.46
		Male	0.48	0.59	0.46	0.57	0.47	0.45
		Female	0.52	0.56	0.41	0.55	0.62	0.48
	15-18	Total	1.02	1.05	1.00	1.14	1.01	0.98
		Male	1.08	0.86	1.07	1.33	1.11	1.04
		Female	0.95	1.24	0.94	0.95	0.91	0.93
Rates per million	Crude	Total	0.77	0.70	0.72	0.91	0.81	0.73
		Male	0.81	0.66	0.76	0.95	0.87	0.77
		Female	0.73	0.74	0.67	0.86	0.75	0.70
	Adjusted*	Total	0.78	0.70	0.73	0.93	0.83	0.75
		Male	0.83	0.66	0.78	0.97	0.90	0.79
		Female	0.74	0.74	0.68	0.89	0.76	0.71

*World Standard Population, modified by Doll et al. (1966)
Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

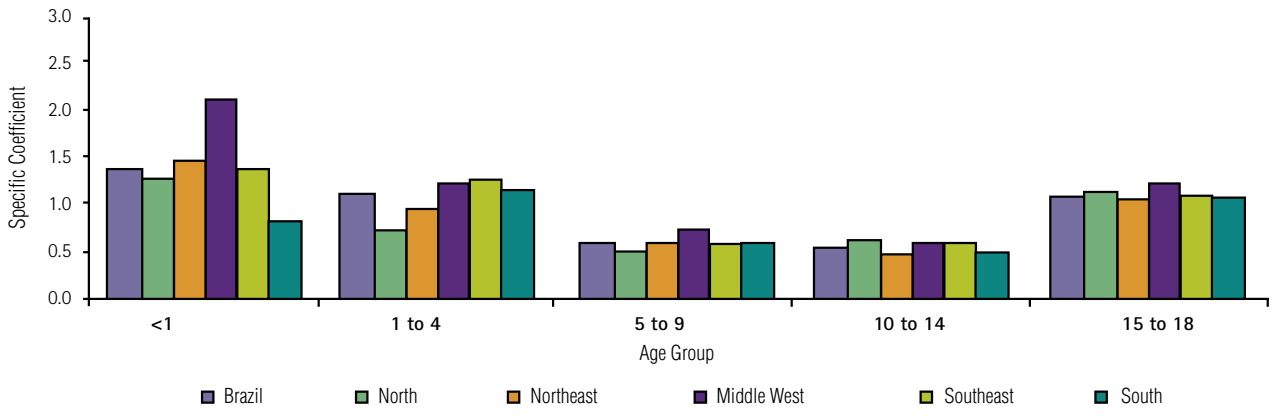

Figure 96. Distribution of age-specific mortality rates by other types of cancer, per million children and adolescents, according to age group, Brazil and Regions, 2001 to 2005

Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

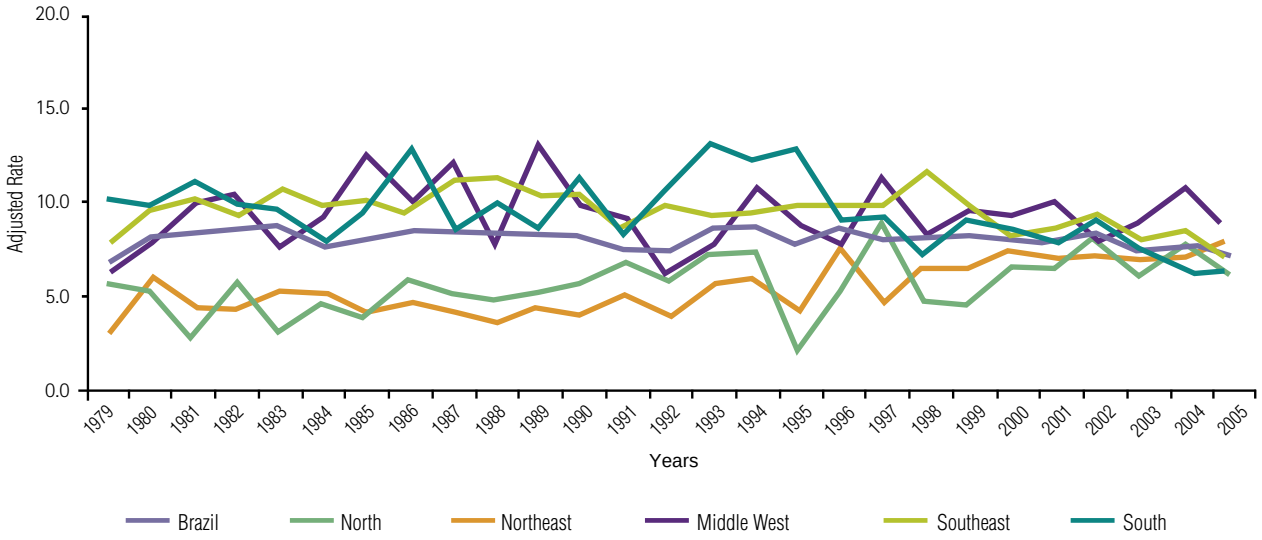

Figure 97. Average age-adjusted* mortality rates by other types of cancer, per million children and adolescents, Brazil and Regions, 1979 to 2005

*World Standard Population, modified by Doll et al. (1966)
Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
MP/Fundação Instituto Brasileiro de Geografia e Estatística - IBGE
MS/INCA/Conprev/Divisão de Informação

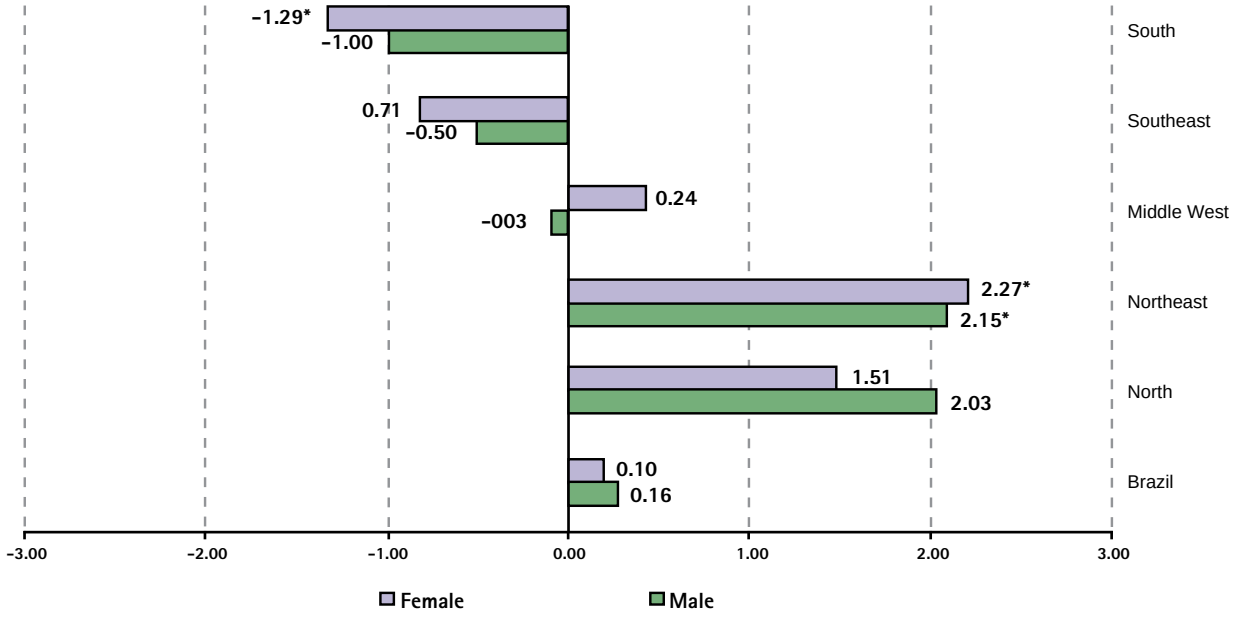

Figure 98. Estimated Annual Percentage Change (EAPC), other types of cancer and sex, Brazil and Regions, 1979 to 2005

*Statistically significant
Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
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Table 82 shows the age-adjusted mortality rate[c] of other malignant tumors in Brazil and regions, between 1979 and 2005. Children younger than 1 year old presented the highest specific mortality rates in Brazil and geographic regions, with the exception of the South, where the highest rate belonged to the 1-4 age group (Figure 96). The mortality time series presented a small increase from 1979 to 2005 in Brazil. The EAPC analysis suggests that this increase was not significant (Figures 97 and 98).

Table 83. Estimated Annual Percent Change (EAPC) by sex, Brazil and Regions, 1979 a 2005

Tumors	Sex	Brazil	North	Northeast	Middle West	Southeast	South
Leukemia	Male	-0.87*(p<0.0001)	1.43*(p=0.0069)	2.08*(p<0.0001)	-1.17*(p=0.0294)	-1.89*(p<0.0001)	-2.23*(p<0.0001)
	Female	-0.71*(p=0.0014)	2.51*(p<0.0001)	1.79*(p<0.0001)	-0.97(p=0.1264)	-1.92*(p<0.0001)	-1.37*(p=0.0011)
Hodgkin Disease	Male	-4.23*(p<0.0001)	-1.74(p=0.3908)	-0.54(p=0.6458)	-2.66(p=0.0590)	-5.93*(p<0.0001)	-4.79*(p<0.0001)
	Female	-2.43*(p=0.0009)	-3.15(p=0.0581)	1.35(p=0.3450)	-1.92(p=0.3489)	-2.69*(p=0.0158)	-1.68(p=0.3083)
Non-Hodgkin Lymphoma	Male	-2.55*(p<0.0001)	0.69(p=0.6786)	-0.05(p=0.9225)	-2.73*(p=0.0007)	-3.87*(p<0.0001)	-3.21*(p<0.0001)
	Female	-2.40*(p<0.0001)	1.75(p=0.1695)	0.38(p=0.7008)	-6.23*(p<0.0001)	-3.75*(p<0.0001)	-2.36*(p=0.0024)
CNS	Male	2.27*(p=0.0029)	5.99*(p=0.0003)	6.89*(p<0.0001)	2.16(p=0.0806)	1.42*(p=0.0281)	0.74(p=0.5625)
	Female	2.40*(p=0.0031)	4.91*(p=0.0005)	7.11*(p<0.0001)	2.09*(p=0.0352)	1.70*(p=0.0195)	0.63(p=0.5629)
Eye	Male	-1.00(p=0.0586)	0.94(p=0.5717)	1.13(p=0.3456)	-3.18*(p=0.0313)	-2.74*(p=0.0019)	-1.12(p=0.2914)
	Female	-2.41*(p=0.0003)	-2.11(p=0.2048)	-0.17(p=0.8914)	-0.26(p=0.8746)	-4.63*(p<0.0001)	-1.21(p=0.4185)
Kidney	Male	-1.08*(p=0.0158)	1.13(p=0.5022)	2.87*(p=0.0005)	-1.78(p=0.1916)	-2.96*(p<0.0001)	-2.88*(p=0.0333)
	Female	-0.92*(p=0.0254)	0.97(p=0.3530)	1.57(p=0.1117)	0.86(p=0.5398)	-2.97*(p<0.0001)	-0.84(p=0.4398)
Bone	Male	-0.05(p=0.8734)	0.22(p=0.9003)	2.80*(p=0.0002)	0.82(p=0.5825)	-0.65(p=0.1050)	-0.87(p=0.0614)
	Female	0.27(p=0.4286)	0.86(p=0.7872)	3.70*(p=0.0001)	0.27(p=0.7593)	-0.84(p=0.0691)	0.11(p=0.8446)
Soft Tissue	Male	0.64(p=0.1346)	-0.49(p=0.8069)	3.73*(p=0.0024)	-0.65(p=0.6398)	-0.29(p=0.6265)	1.88(p=0.1880)
	Female	0.73*(p=0.0205)	3.23*(p=0.0399)	3.27*(p=0.0392)	-0.76(p=0.5510)	-0.48(p=0.4173)	1.29(p=0.1138)
Other Tumors	Male	0.16(p=0.3392)	2.03(p=0.0649)	2.15*(p=0.0001)	-0.03(p=0.9511)	-0.50(p=0.0906)	-1.00(p=0.0566)
	Female	0.10(p=0.6248)	1.51(p=0.0610)	2.27*(p=0.0002)	0.24(p=0.7032)	-0.71(p=0.0529)	-1.29*(p=0.0075)
All Neoplasms	Male	-0.27(p=0.1295)	1.60*(p=0.0004)	2.51*(p<0.0001)	-0.53(p=0.2186)	-1.24*(p<0.0001)	-1.39*(p<0.0001)
	Female	-0.04(p=0.8614)	2.10*(p<0.0001)	2.53*(p<0.0001)	-0.32(p=0.4363)	-1.01*(p<0.0001)	-0.82*(p=0.0020)

* Statistically significant

Sources: MS/SVS/DASIS/CGIAE/Sistema de Informação sobre Mortalidade – SIM
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c Rates per million, adjusted for World Standard Population, 1966

V. Final considerations

The incidence rate of all types of cancer in children and adolescents has increased in the last decade. From 1975 to 1999, the annual percent change (APC) in the United States revealed an average increase in incidence rates between 1975 and 1986 of 0.9 ($p<0.005$) in children aged 0 to 4; 0.4 ($p>0.05$) in ages 5 to 9; 1.0 ($p<0.05$) in ages 10 to 14; 0.6 ($p<0.05$) in ages 15 to 19. However, the more recent period (1987-1999) showed that the incidence rate has remained stable. In ages 0-4, 0.4 ($p>0.05$); ages 5 to 9, -0.2 ($p>0.05$); ages 10 to 14, 1.1 ($p<0.05$); ages 15 to 19, -0.3 ($p<0.05$) (Ries, 2002).

Childhood cancer treatment can be considered one of the greatest success stories in recent decades. This improvement has been attributed to the therapeutic advances and early diagnosis methods, especially those registered during the 1970s (Adami, 1992). There are many factors that may influence prognosis: host factors (sex, age, race, comorbidity, economic background); tumor-related factors (extension, primary location, morphology, and biology) and, finally, healthcare-related factors (screening, diagnosis and treatment facility, treatment quality and follow-up care) (Black, 1998). Cancer cure in children flipped 180 degrees, from an 85% mortality rate to an 85% cure rate (Bleyer, 1997).

There has been considerable mortality decrease over the last 30 years. The relative 5-year survival rates for all types of cancer went from 56% between 1974 and 1976 to 77% in 1992-1998 ($p < 0.05$) (Jemal, 2003). The mortality decrease of children with cancer was more significant in North America, probably due to the early beginning of cooperative groups with well-structured and up-to-date protocols. In other parts of the world, this integration and formation of cooperative groups happened later. In most European countries, pediatric oncology was organized during the 1970s, but this may have occurred during the 1980s or even 1990s (Coebergh, 2001). Survival of patients registered in single institutions using a therapeutic clinical trial reflects the efficiency of these institution; however, the survival of patients evaluated through population information reflects a country's health policies, which includes access to treatment, preventive measures, methods for assessing the efficacy of diagnosis and treatment (Stiller, 1990). Survival assessed through population information is generally lower than observed in a clinical trial. A North American analysis obtained from SEER information recently observed that 58% of children and adolescents with localized disease were registered in cooperative groups, while 77% of patients with metastatic disease were registered in cooperative groups (Lui, 2003). These data suggest that patients with localized disease are more easily treated and need less participation in a cooperative protocol, while the advanced disease requires more specialized therapeutic planning, meaning more orientation from a cooperative protocol. We know that, when treated in a specialized center, following a therapeutic protocol and participating in a cooperative group, children present higher chances of survival (Meadows, 1983 and Stiller, 1989). The field of oncology, particularly pediatric oncology, has been routinely conducting randomized clinical trials, viewed as crucial for scientifically reinforcing conducts adopted for the patient. Stiller and Eatock (1994) reported that the survival of children suffering from acute lymphoblastic leukemia was influenced by the child's participation in a clinical trial, regardless of the institution. From 1980 to 1984, patients registered in a clinical protocol presented a survival of 70% compared to 64% for those who were not registered. Authors suggest that there was a larger number of early deaths occurring in 5% during the induction phase (Éden, 1991). We know that the treatment following a well conducted protocol, including suggestions of support treatment, present improved survival. The lack of a protocol follow-up that guides medical practitioners beyond therapeutic schemes and support care presents greater risk of failing (Eden, 2000). Currently, 90% of children with cancer in the United States receive treatment from a protocol that is registered in a cooperative group (Ross, 1996). In the United Kingdom, cooperative groups were organized after 1977 (UK Children's Cancer Study Group) and to this day, there is an effort towards recruiting the total number of children with cancer in the country

(Ablett, 2003). There were suggestions of standardizing pediatric oncology centers across the world (American Academy of Pediatrics, 1986). In 1990, the International Society of Pediatric Oncology (SIOP) presented norms for training pediatric oncologists and standardizing treatment in healthcare units, thus allowing for standardized care throughout all continents (Spinetta, 1999, Spinetta, 2000, Spinetta, 2003, Masera, 1995, Masera, 1996, Masera, 1998 and Masera, 1999). Support treatment is as important as surgical, radiotherapy, and chemotherapy treatments and is undoubtedly one of the main factors that are responsible for improving survival after the introduction of multidisciplinary treatment. Early identification of complications is essential for a successful treatment.

The Brazilian Society of Pediatric Oncology (SOBOPE) was founded in 1981 and its main objective was to gather colleagues interested in accelerating the progress, development and expansion of pediatric oncology. Since 1980, stimulated by then president Dr. Nubia Mendonça, Brazilian cooperative groups organized themselves for the treatment of pediatric tumors. The first group focused on the treatment of acute leukemias under the coordination of Dr. Silvia Brandalise; the second, in 1985, focused on non-Hodgkin lymphoma, Wilms' tumor and osteosarcoma followed. There are currently seven active cooperative groups and others in course. Unfortunately, the patient registry in cooperative groups remains very small. The first cooperative group for Wilms' tumor treatment registered only 25% of estimated cases in Brazil during the analyzed period. And the osteosarcoma group registered only 10% of estimated cases during this period. In 1998, the Banco do Brasil Foundation, in partnership with the Ministry of Health and the Instituto Nacional de Câncer, initiated the Programa Criança e Vida in order to support, promote, finance and encourage healthcare initiatives for children and adolescents with cancer. The result of this combined effort included the implementation of eight reference centers in pediatric cancer diagnosis; improvement of technological infrastructure and increase in attendance quality and quantity of public and philanthropic hospitals; and the inauguration of a computerized pediatric oncology center, the Central Informatizada de Oncologia Pediatrica (CIOPE), which aims to create a database registering all cancer cases of children treated in cooperative group protocols. This program lasted five years. In 2004, a partnership with the Ronald McDonald Institute rendered the necessary conditions for operating the CIOPE.

As mentioned previously, the specific cause of death is often not correctly typified and often lack medical information, which generate discord about the validity of cancer-specific mortality rates. It is possible to observe a decrease in poorly defined causes in Brazil.

Delay in diagnosis remains an important factor in prognosis. In the Department of Pediatrics at the São Paulo Hospital do Câncer-AC Camargo, we observed a considerable reduction in the average lag time (interval between first signs to diagnosis) throughout the years. Between 1975 and 1980, the average lag time was 8.2 months and between 1986 and 1990 it was 5.6 months (Rodrigues, 2000). By assessing socio-demographic, socio-economic and clinical variables and comparing them to case history, we demonstrate that the delay has many factors and is different for each type of cancer. Symptoms like anemia and adenopathy are predictive factors that do not depend on diagnosis delay in those affected with acute leukemia, abdominal pain in those affected with non-Hodgkin lymphoma, or strabismus in those affected with retinoblastoma. Higher education level of the mother reduced the average lag time among those affected with acute lymphoblastic leukemia, and higher family income reduced the lag time among those affected with neuroblastoma but lag time increased among those with central nervous system tumors. Adolescents presented greater time intervals, suggesting late diagnosis, probably with more advanced disease (Rodrigues, 2002). In 327 children with retinoblastoma treated at São Paulo's Hospital do Câncer-AC Camargo, the average lag time was 5.8 months. Patients older than 2 years old presented longer lag time compared to infants (7.2 months vs. 4.7 months; $p = 0.001$) Patients with strabismus presented longer lag time (8.8 months) compared to patients with tumor (2.3 months) or leukocoria (5.6 months) ($p = 0.014$). Patients with metastatic disease presented longer lag time. Lag time was related to advanced disease, metastasis and strabismus. Five-year overall survival was higher among patients with localized disease and among patients whose lag time were less than 6 months (91%) compared to patients with a longer lag time of 6 months (78%) ($p < 0.001$) (Rodrigues, 2004). The Brazilian Osteosarcoma Group revealed that 21% of patients presented metastasis during diagnosis, which is higher than other North American and European groups. However, it was not possible to assert that the presence of metastasis was related to diagnosis delay. The duration of symptoms did

not correlate with the presence of metastasis, tumor size, or survival. This information suggests that the stage of the disease has more relation to biological aspects of the tumor than to diagnosis delay (Petrilli, 2006). Diagnosis of pediatric cancer is a complex process and many variables seem to influence it. The best understanding of the relation between factors is of vital importance for developing public health strategies for the early detection of childhood cancer. Determining the signs and symptoms of malignant disease is still a challenge (Rodrigues, 2003). A survey conducted in the Northeast verified the lay population's knowledge of signs and symptoms alerting for cancer suspicion in children. The results showed that knowledge was very limited, which shows that rigorous and constant educational efforts are crucial (Workman, 2007). Other initiatives such as the program "Unidos pela Cura", which counts on SUS administrators, specialized services and civil society - SOPERJ, SOBOPE and Instituto Desiderata, aim to promote early diagnosis of pediatric cancer and patient referral for investigation and specialization centers. This program aspires to qualify pediatricians to suspect cancer in children and refer them to a specialized center. The program currently relies on 21 tutors who work in pairs and qualify pediatricians by means of active learning, following the method of problem-based learning (PBL) (www.desiderata.org.br). The Ronald McDonald Institute also started an early detection program that aims to reduce the period of time between the appearance of signs and symptoms and the diagnosis in a specialized service, thus contributing to increase the probability of cure in children and adolescents with cancer. In order to do so, the program intends to qualify professionals of the Family Health Program (Programa Saúde da Família) to suspect and adequately refer cases of children and adolescents who may be afflicted with cancer and offer tools for aiding and updating trained professionals (www.instituto-ronald.org.br). The following projects were selected for the pilot phase: Alagoas/ Maceió/ APALA: "The Earlier The Better"; Bahia/ Salvador/ GACC: "Qualification of Family Health Teams for Promoting Early Diagnosis of Children and Adolescents with Cancer"; Maranhão/ São Luis/ Antonio Jorge Dino Foundation: "Early diagnosis: The Role of Family Health Programs in Munin, in the State of Maranhão"; Minas Gerais/ Montes Claros/ Sara Foundation: "Articulating Early Diagnosis"; Paraná/ Cascavel/ UOPECCAN: "Early diagnosis of Children and Adolescents with Cancer"; Pernambuco/ Recife/ GAC: "Early diagnosis of pediatric cancer in primary health care: the challenge of qualifying primary health care by creating an organization protocol"; São Paulo/ Santo André/ Casa Ronald McDonald: "Strategies for early diagnosis for children and adolescents with cancer in the municipality of São Bernardo"; Rio Grande do Norte/ Natal/ Casa Durval Paiva: "Early diagnosis Campaign". Many centers give assistance to children and their families and Brazil currently has two large groups: União Norte e Nordeste das Entidades de Apoio a Criança com Câncer (UNEACC) and União Sul e Sudeste das Instituições de Assistência a Criança e ao Adolescente com Cancer (UNIVERSO). There are 109 support groups in SOBOPE.

Recently INCA/Ministry of Health created a permanent forum (Fórum Permanente de Atenção Integral a Criança e Adolescente com Câncer) with five fundamental fields of action: partnership integration: development of a portal of integral assistance; quality of diagnosis: elaboration of a mechanism that guides diagnoses; quality of assistance: elaboration of an evaluation matrix of onco-pediatric services; broadcasting and communication; identification of integral assistance for childhood cancer. All these initiatives will undoubtedly improve pediatric oncology in the country. Future information will serve as evidence.

There are currently 144 pediatric oncology centers registered in SOBOPE throughout Brazil. There are 22 medical residency programs in pediatric oncology approved by FUNDAP (agency linked to the Ministry of Education regulating medical residencies).

The title of specialist in pediatric cancerology was initially conferred in 1996 by the Brazilian Society of Cancerology, the Brazilian Medical Association and the Federal Council of Medicine. In the beginning, 104 medical doctors were awarded the title due to proficiency. There have been eight selective processes until now and 103 doctors have passed.

Some Brazilian publications are revisited in this work. We can verify that there are day-by-day advances. It is increasingly common to find international publications of results and experiences and international authors have often quoted Brazilian publications. Brazilian cooperative groups have improved survival rates of children and adolescents with cancer and, undoubtedly, this progress will be examined in future publications. It is still a great challenge to increase the number of children registered in cooperative groups and treated uniformly throughout the country.

The results here presented may be attributed to differences in access to diagnosis and treatment services. This information is a descriptive analysis of what currently exists in Brazil. It is possible to observe that the quality of the registries is improving, the poorly defined causes are decreasing and, in the near future, more precise information will be obtained. The authors are convinced, however, that the information here presented will contribute to expand knowledge of childhood and adolescent cancer

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Annexes

Annex 1

International Classification of Childhood Cancer according to the International Agency for Research on Cancer (IARC)

(KRAMAROVA and STILLER, 1996)

Chart 2. International Classification of Childhood Cancer, Second Edition

DIAGNOSTIC GROUP	MORPHOLOGY
I – LEUKEMIAS	Lymphoid Leukemia Acute non-lymphocytic leukemia Chronic myeloid leukemia Other specified leukemia Unspecified leukemia
II – LYMPHOMA AND RETICULOENDOTHELIAL NEOPLASMS	Hodgkin lymphoma Non-Hodgkin lymphoma Burkitt lymphoma Miscellaneous lymphoreticular neoplasms Unspecified lymphoma
III-CNS AND MISCELLANEOUS INTRACRANIAL AND INTRASPINAL NEOPLASMS	Ependymoma Astrocytoma Primitive neuroectodermal tumors Other gliomas Miscellaneous intracranial and intraspinal neoplasms Unspecified intracranial and intraspinal neoplasms
IV–SYMPATHETIC NERVOUS SYSTEM TUMORS	Neuroblastoma and ganglioneuroblastoma Other sympathetic nervous system tumors
V– RETINOBLASTOMA	
VI – RENAL TUMORS	Wilms tumor, rhabdoid and clear cell sarcoma Renal carcinoma Unspecified malignant renal tumors

(*Chart 2. Cont.*)

VII – HEPATIC TUMORS	Hepatoblastoma Hepatic carcinoma Unspecified malignant hepatic tumors
VIII – MALIGNANT BONE TUMORS	Osteosarcoma Chrondosarcoma Ewing sarcoma Other specified malignant bone tumors Unspecified malignant bone tumors
IX – SOFT-TISSUE SARCOMAS	Rhabdomyosarcoma and embryonal sarcoma Fibrosarcoma, neurofibrosarcoma and other fibromatous neoplasms Kaposi sarcoma Other specified soft-tissue sarcomas Unspecified soft-tissue sarcomas
X – GERM-CELL, TROPHOBLASTIC AND OTHER GONADAL NEOPLASMS	Intracranial and intraspinal germ-cell tumors Other and unspecified non-gonadal germ-cell tumors Gonadal germ-cell tumors Gonadal carcinomas Other and unspecified malignant gonadal tumors
XI – CARCINOMAS AND OTHER MALIGNANT EPITHELIAL NEOPLASMS	Adrenocortical carcinoma Thyroid carcinoma Nasopharyngeal carcinoma Malignant melanoma Skin carcinoma Other and unspecified carcinomas
XII – OTHER AND UNSPECIFIED MALIGNANT NEOPLASMS	Other specified malignant tumors Other and unspecified malignant tumors

Chart 3. International Classification of Childhood Cancer, Third Edition: Extended Classification Table

ICCC-3 Site Group	ICD-O-3 Code(s)	
	Morphology	Topography
Ia. Lymphoid leukemias		
1. Precursor cell leukemias	9835, 9836, 9837	
2. Mature B-cell leukemias	9823, 9826, 9832, 9833, 9940	
3. Mature T-cell and NK cell leukemias	9827, 9831, 9834, 9948	
4. Lymphoid leukemia, NOS	9820	
IIb. Non-Hodgkin lymphomas		
1.Precursor cell lymphomas	9727, 9728, 9729	
2. Mature B-cell lymphomas (except Burkitt lymphoma)[a]	9670, 9671, 9673, 9675, 9678–9680, 9684, 9689–9691, 9695, 9698, 9699, 9731–9734, 9761,9762, 9764–9766, 9769, 9970	
3. Mature T-cell and NK-cell lymphomas	9700–9702[b], 9705, 9708, 9709, 9714, 9716–9719, 9767, 9768	
4. Non-Hodgkin lymphomas, NOS	9591, 9760	
IIIa. Ependymomas and choroid plexus tumor		
1. Ependymomas	9383, 9391–9394[c]	
2. Choroid plexus tumor	9390[c]	
IIIc. Intracranial and intraspinal embryonal tumors		
1. Medulloblastomas	9470–9472, 9474, 9480[c]	
2. PNET	9473[c]	
3. Medulloepithelioma	9501–9504[c]	C70.0–C72.9
4. Atypical teratoid/rhabdoid tumor	9508[c]	
IIId. Other gliomas		
1. Oligodendrogliomas	9450, 9451, 9460[c]	
2. Mixed and unspecified gliomas	9380[c]	C70.0–C72.2, C72.4–C72.9, C75.1, C75.3
	9382[c]	
3. Neuroepithelial glial tumors of uncertain origin	9381, 9430, 9444[c]	
IIIe. Other specified intracranial and intraspinal neoplasms		
1. Pituitary adenomas and carcinomas	8270–8281, 8300[c]	
2. Tumors of the sellar region (craniopharyngiomas)	9350–9352, 9582[c]	
3. Pineal parenchymal tumors	9360–9362[c]	
4. Neuronal and mixed neuronal-glial tumors	9412, 9413, 9492, 9493, 9505–9507[c]	
5. Meningiomas	9530–9539[c]	
VIa. Nephroblastoma and other nonepithelial renal tumors		
1. Nephroblastoma	8959, 8960	
2. Rhabdoid renal tumor	8963	C64.9
3. Kidney sarcomas	8964–8967	
4. pPNET of kidney	9364	C64.9
VIIIc. Ewing tumor and related sarcomas of bone		
1. Ewing tumor and Askin tumor of bone	9260	C40.0–C41.9, C76.0–C76.8, C80.9
	9365	C40.0–C41.9
2. pPNET of bone	9363, 9364	C40.0–C41.9
VIIId. Other specified malignant bone tumors		
1. Malignant fibrous neoplasms of bone	8810, 8811, 8823, 8830	C40.0–C41.9
	8812, 9262	
2. Malignant chordomas	9370–9372	
3. Odontogenic malignant tumors	9270–9275,9280–9282, 9290, 9300–9302, 9310–9312, 9320–9322, 9330, 9340–9342	
4. Miscellaneous malignant bone tumors	9250, 9261	

(*Chart 3. Cont.*)

IXb. Fibrosarcomas, peripheral nerve sheath tumors, and other fibrous neoplasms		
1. Fibroblastic and myofibroblastic tumors	8810, 8811, 8813–8815, 8821, 8823, 8834–8835 8820, 8822, 8824–8827, 9150, 9160	C00.0–C39.9, C44.0–C76.8, C80.9
2. Nerve sheath tumors	9540–9571	
3. Other fibromatous neoplasms	9491, 9580	
IXd. Other specified soft tissue sarcomas		
1. Ewing tumor and Askin tumor of soft tissue	9260	C00.0–C39.9, C47.0–C75.9
	9365	C00.0–C39.9, C47.0–C63.9, C65.9–C76.8, C80.9
2. pPNET of soft tissue	9364	C00.0–C39.9, C47.0–C63.9, C65.9-C69.9, C73.9–C76.8, C80.9
3. Extrarenal rhabdoid tumor	8963	C00.0–C63.9, C65.9–C69.9, C73.9–C76.8, C80.9
4. Liposarcomas	8850–8858, 8860–8862, 8870, 8880, 8881	
5. Fibrohistiocytic tumors	8830	C00.0–C39.9, C44.0–C76.8, C80.9
	8831–8833, 8836, 9251, 9252	
6. Leiomyosarcomas	8890–8898	
7. Synovial sarcomas	9040–9044	
8. Blood vessel tumors	9120–9125, 9130–9133, 9135, 9136, 9141, 9142, 9161, 9170–9175	
9. Osseous and chondromatous neoplasms of soft tissue	9180, 9210, 9220, 9240	C49.0–C49.9
	9231	
10. Alveolar soft parts sarcoma	9581	
11. Miscellaneous soft tissue sarcomas	8587, 8710–8713, 8806, 8840–8842, 8921, 8982, 8990, 9373	
Xa. Intracranial and intraspinal germ cell tumors		
1. Intracranial and intraspinal germinomas	9060–9065[c]	C70.0–C72.9, C75.1–C75.3
2. Intracranial and intraspinal teratomas	9080–9084[c]	C70.0–C72.9, C75.1–C75.3
3. Intracranial and intraspinal embryonal carcinomas	9070, 9072[c]	C70.0–C72.9, C75.1–C75.3
4. Intracranial and intraspinal yolk sac tumor	9071[c]	C70.0–C72.9, C75.1–C75.3
5. Intracranial and intraspinal choriocarcinoma	9100[c]	C70.0–C72.9, C75.1–C75.3
6. Intracranial and intraspinal tumors of mixed forms	9085, 9101[c]	C70.0–C72.9, C75.1–C75.3
Xb. Malignant extracranial and extragonadal germ cell tumors		
1. Malignant germinomas of extracranial and extragonadal sites	9060–9065	C00.0–C55.9, C57.0–C61.9, C63.0-C69.9, C73.9–C75.0,C75.4–C76.8, C80.9
2. Malignant teratomas of extracranial and extragonadal sites	9080–9084	C00.0–C55.9, C57.0–C61.9, C63.0–C69.9, C73.9–C75.0,C75.4–C76.8, C80.9
3. Embryonal carcinomas of extracranial and extragonadal sites	9070, 9072	C00.0–C55.9, C57.0–C61.9, C63.0–C69.9, C73.9–C75.0,C75.4–C76.8, C80.9
4. Yolk sac tumor of extracranial and extragonadal sites	9071	C00.0–C55.9, C57.0–C61.9, C63.0–C69.9, C73.9–C75.0, C75.4–C76.8, C80.9
5. Choriocarcinomas of extracranial and extragonadal sites	9100, 9103, 9104	C00.0–C55.9, C57.0–C61.9, C63.0–C69.9, C73.9–C75.0, C75.4–C76.8, C80.9
6. Other and unspecified malignant mixed germ cell tumors of extracranial and extragonadal sites	9085, 9101, 9102, 9105	C00.0–C55.9, C57.0–C61.9, C63.0–C69.9, C73.9–C75.0, C75.4–C76.8, C80.9
Xc. Malignant gonadal germ cell tumorss		
1. Malignant gonadal germinomas	9060–9065	C56.9, C62.0–C62.9
2. Malignant gonadal teratomas	9080–9084, 9090, 9091	C56.9, C62.0–C62.9
3. Gonadal embryonal carcinomas	9070, 9072	C56.9, C62.0–C62.9
4. Gonadal yolk sac tumor	9071	C56.9, C62.0–C62.9
5. Gonadal choriocarcinoma	9100	C56.9, C62.0–C62.9
6. Malignant gonadal tumors of mixed forms	9085, 9101	C56.9, C62.0–C62.9
7. Malignant gonadal gonadoblastoma	9073	C56.9, C62.0–C62.9

(*Chart 3. Cont.*)

XIf. Other and unspecified carcinomas		
1. Carcinomas of salivary glands	8010–8084, 8120–8157, 8190–8264,	C07.9–C08.9
2. Carcinomas of colon and rectum	8290, 8310	C18.0, C18.2–C18.9, C19.9, C20.9, C21.0–C21.8
	8313–8315, 8320–8325, 8360, 8380–8384,	
3. Carcinomas of appendix	8430–8440, 8452–8454, 8480–8586,	C18.1
4. Carcinomas of lung	8588–8589, 8940, 8941, 8983, 9000, 9010–	C34.0–C34.9
5. Carcinomas of thymus	9016, 9020, 9030	C37.9
6. Carcinomas of breast		C50.0–C50.9
7. Carcinomas of cervix uteri		C53.0–C53.9
8. Carcinomas de bexiga		C67.0–C67.9
9. Carcinomas of eye		C69.0–C69.9
10. Carcinomas of other specified sites		C00.0–C06.9, C09.0–C10.9, C12.9–C17.9, C23.9–C33.9, C38.0–C39.9, C48.0–C48.8,C51.0–C52.9,C54.0–C54.9, C55.9, C57.0–C61.9, C63.0–C63.9, C65.9–C66.9, C68.0–C68.9, C70.0–C72.9, C75.0–C75.9
11. Carcinomas of unspecified site		C76.0–C76.8, C80.9
XIIa. Other specified malignant tumors		
1. Gastrointestinal stromal tumor	8936	
2. Pancreatoblastoma	8971	
3. Pulmonary blastoma and pleuropulmonary blastoma	8972, 8973	
4. Other complex mixed and stromal neoplasms	8930–8935, 8950, 8951, 8974–8981	
5. Mesothelioma	9050–9055	
6. Other specified malignant tumors	9110	
	9363	C00.0–C39.9, C47.0–C75.9

ICCC-3: International Classification of Childhood Cancer ICD-O-3: International Classification of Diseases for Oncology, Third Edition; NOS: No Other Specification; NK : Natural Killer Cells; PNET: Primitive neuroectodermal tumor; pPNET: Peripheral primitive neuroectodermal tumor.

[a] Both Burkitt Lymphoma (IIc) and Non-Hodgkin of mature B cells may be grouped as IIb2 for the general presentation of B-cell lymphomas.

[b] 9702 “T-cell lymphomas, NOS” in children almost always correspond to code M9729.

[c] Tumors with non-malignant behavior will be included for all morphological codes in this line.

Annex 2.

Indicators and Health Information (IDB), Brazil and Regions, 2007

Table 84. Demographic indicators

Demographic Indicators	Brazil	North	Northeast	Middle West	Southeast	South
A.1 - Total Population	186,770,560	15,022,064	51,609,020	13,269,520	79,561,095	27,308,861
A.2 - Male/Female Ratio	96.69	102.09	96.15	98.12	95.55	97.51
A.3 - Population Growth Rate	1.62	2.58	1.32	2.24	1.60	1.43
A.4 - Degree of Urbanization	84.53	75.21	74.18	89.6	91.98	85.02
A.5 - Total Fecundity Rate	2.01	2.45	2.23	2.01	1.83	1.76
A.6 – Specific Fecundity Rate						
A.6.1 – ages 15 to 19	0.08	0.11	0.09	0.08	0.06	0.06
A.6.2 - ages 20 to 24	0.12	0.16	0.14	0.13	0.10	0.09
A.6.3 - ages 25 to 29	0.09	0.11	0.10	0.09	0.09	0.08
A.6.4 - ages 30 to 34	0.06	0.06	0.05	0.05	0.06	0.06
A.6.5 - ages 35 to 39s	0.03	0.03	0.03	0.02	0.03	0.03
A.6.6 - ages 40 to 44	0.01	0.01	0.01	0.00	0.00	0.01
A.6.7 - ages 45 to 49	0.00	0.00	0.00	0.00	0.00	0.00
A.7 - Crude Birth Rate						
A.7.1 – Calculated	17.98	23.05	21.39	19.01	15.78	14.72
A.7.2 – Standard	17.90	22.16	20.08	18.20	16.11	15.48
A.8 – Age-Proportional Mortality						
A.8.1 – younger than 1 year of age	5.14	11.30	7.43	6.12	3.66	3.39
A.8.2 – ages 1 to 4	0.87	2.49	1.19	1.09	0.58	0.56
A.8.3 - ages 5 to 9	0.48	0.96	0.63	0.62	0.36	0.37
A.8.4 - ages 10 to 14	0.58	1.14	0.68	0.80	0.46	0.50
A.8.5 - ages 15 to 19	1.89	3.01	2.09	2.36	1.66	1.67
A.8.6 - ages 20 to 24	2.63	3.95	2.97	3.25	2.36	2.19
A.8.7 - ages 25 to 29	2.63	3.94	2.96	3.43	2.38	2.11
A.8.8 - ages 30 to 34	2.66	3.75	2.81	3.31	2.54	2.18
A.8.9 - ages 35 to 39	3.18	3.77	3.15	3.95	3.10	2.92
A.8.10 - ages 40 to 44	3.97	4.12	3.76	4.57	4.07	3.71
A.8.11 - ages 45 to 49	4.95	4.61	4.35	5.52	5.26	4.86
A.8.12 - ages 50 to 54	5.78	5.13	5.02	6.11	6.20	5.85
A.8.13 - ages 55 to 59	6.45	5.44	5.75	6.71	6.78	6.80
A.8.14 - ages 60 to 64	7.18	6.00	6.39	7.79	7.42	7.91
A.8.15 - ages 65 to 69	8.83	7.60	7.96	8.75	9.14	9.73
A.8.16 - ages 70 to 74	9.73	7.93	8.55	9.06	10.23	11.04
A.8.17 - ages 75 to 79	10.59	7.99	9.76	9.06	11.19	11.59
A.8.18 - ages 80 and older	22.47	16.88	24.57	17.52	22.58	22.63
A.9 - Age-Proportional Mortality in < 1 year						
A.9.1 - 0 to 6 days	51.32	50.49	52.4	49.85	50.87	51.00
A.9.2 - 7 to 27 days	15.48	12.90	12.90	17.20	18.25	17.39
A.9.3 - 28 days and more	33.20	36.61	34.70	32.95	30.88	31.61
A.10 – Crude Mortality Rate						
A.10.1 - Calculated	6.22	5.00	7.03	5.29	6.15	6.00
A.10.2 - Standard	5.93	6.24	6.90	5.92	5.44	5.38
A.11 – Life Expectancy at Birth						
A.11.1 – Male	68.67	68.5	65.81	70.09	69.81	71.09
A.11.2 – Female	76.22	74.26	73.08	77.01	77.94	77.96
A.11.3 – General	72.35	71.31	69.36	73.46	73.77	74.44
A.12 - Life Expectancy at 60						
A.12.1 - Male	19.41	19.35	18.96	20.38	19.62	19.28
A.12.2 - Female	22.56	21.23	21.03	23.07	23.35	23.08
A.12.3 - Geral	21.05	20.25	20.06	21.70	21.59	21.25
A.13 – Proportion of Children Under 5 in Population	8.90	11.30	10.10	9.10	8.10	7.70
A.14 - Proportion of Elderlies in Population						
A.14.1 - Male	8.30	5.60	7.30	7.30	9.20	9.40
A.14.2 - Female	9.90	5.60	8.60	7.60	11.30	11.30
A.14.3 - Geral	9.10	5.60	8.00	7.40	10.30	10.40
A.15 – Ageing Rate	32.40	15.80	25.20	26.60	40.90	40.60
A.16 – Dependency Ratio						
A.16.1 - Young	44.50	59.60	52.20	43.30	38.90	39.80
A.16.2 - Elderly	14.40	9.40	13.20	11.50	15.90	16.20
A.16.3 - Total	58.90	69.00	65.40	54.90	54.80	55.90

Source: MS/SVS/DASIS/CGIAE/Indicators and Health Information (IDB), 2007

North Region: Acre, Amapá, Amazonas, Pará, Rondônia, Roraima and Tocantins
Northeast Region: Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí, Rio Grande do Norte and Sergipe
Southeast Region: Espírito Santo, Minas Gerais, Rio de Janeiro and São Paulo
South Region: Paraná, Rio Grande do Sul and Santa Catarina
Middle West Region: Brasilia, Goiás, Mato Grosso and Mato Grosso do Sul

Table 85. Resource indicators

Resource Indicators	Brazil	North	North-east	Middle West	Southeast	South
E.1 – Number of Health Professionals Per Inhabitant						
E.1.1 - Doctors	1.64	0.84	1.02	1.71	2.31	1.26
E.1.2 – Dentists	1.16	0.53	0.57	1.32	1.60	1.27
E.1.3 – Nurses	0.55	0.50	0.46	0.60	0.60	0.58
E.1.4 – Nutritionists	0.20	0.09	0.11	0.18	0.26	0.27
E.1.5 – Veterinarians	0.45	0.23	0.24	0.78	0.48	0.74
E.1.6 - Pharmacists	0.56	0.30	0.29	0.67	0.65	0.89
E.1.7 – Nursing Technicians	0.96	1.26	0.42	1.60	0.89	1.70
E.1.8 – Nursing Assistants	2.30	1.34	1.49	1.91	3.15	2.06
E.2 – Number of Hospital Beds Per Inhabitant						
E.2.1 – Public	0.81	1.07	1.03	0.96	0.68	0.55
E.2.2 – Private	1.60	0.78	1.24	1.66	1.76	2.21
E.2.3 - Total	2.41	1.85	2.27	2.62	2.44	2.76
E.3 - Number of Hospital Beds (SUS) Per Inhabitant						
E.3.1 - Public	0.87	1.11	1.12	1.04	0.73	0.54
E.3.2 - Private	1.14	0.52	1.04	1.16	1.16	1.61
E.3.3 - Total	2.00	1.63	2.16	2.20	1.89	2.15
E.6 – Public Spending on Health						
E.6.1 - Public Spending on Health in Proportion to GDP	3.45	4.6	5.00	2.38	2.53	2.58
E.6.2 - Public Spending on Health per capita	449.93	387.13	312.90	393.10	435.48	379.08
E.9 – Family Spending On Health In Proportion To Family Income						
E.9.1 - Proportion of total health-related expenses	5.32	4.34	5.39	5.15	5.51	4.96
E.9.2 - Proportion of medication expenses	2.16	2.19	2.59	2.23	2.03	2.13
E.9.3 - Proportion of health plan and insurance expenses	1.50	0.76	1.49	1.17	1.72	1.15
E.9.4 - Proportion of other health expenses	1.66	1.39	1.31	1.74	1.76	1.67
E.10 - Average Spending (SUS) Per Walk-In Assistance						
E.10.1 – Basic assistance	1.22	1.08	1.15	1.09	1.30	1.29
E.10.2 – Other assistance	7.56	6.61	6.91	8.10	7.65	8.55
E.10.3 - Total	2.85	2.12	2.39	2.61	3.20	3.06
E.11 – Average Cost Paid Per SUS Hospitalization (AIH)						
E.11.1 – Clinical Medicine	415.11	342.96	362.92	370.95	455.38	453.35
E.11.2 – Pediatrics	486.45	382.57	411.48	477.62	568.03	577.14
E.11.3 – Obstetrics	390.28	373.70	382.51	393.28	398.47	402.64
E.11.4 – Surgical Clinical Medicine	984.92	653.29	784.35	932.40	1073.28	1217.66
E.11.5 – Psychiatry	1539.48	1001.46	1612.99	958.49	1883.92	960.23
E.11.6 - Psychiatry – hospital-day	631.29	724.00	750.92	654.32	574.10	590.99
E.11.7 – Assistance to chronic diseases and out of pharmaceutical reach	7131.97	0.00	3683.3	4171.79	8850.4	2928.97
E.11.8 – Rehabilitation	921.05	0.00	832.64	924.51	989.42	0.00
E.11.9 – Pulmonology	883.68	645.41	817.48	806.52	951.24	962.58
E.11.10 - Total	617.22	431.15	512.02	544.29	717.31	701.66
E.12 – Public Spending with Sanitation, in Proportion to GDP	0.34	0.33	0.36	0.22	0.36	0.14
E.15 - Number of People with Undergraduate Health Degrees						
E.15.1 - Medicine	10,004	433	1,459	462	6,125	1,525
E.15.2 – Dentistry	8,919	328	1,237	637	4,998	1,719
E.15.3 – Nursing	19,813	758	2,571	1,196	12,026	3,262
E.15.4 – Pharmacy	11,276	498	1,118	826	5,433	3,401
E.15.5 – Veterinarian Medicine	4,672	64	595	542	2,500	971
E.15.6 –Nutrition	6,317	240	356	418	3,870	1,433
E.16 – Distribution of Jobs Requiring University Education in Health Establishments						
E.16.1 – Federal	4.09	4.77	4.00	5.59	3.87	4.04
E.16.2 – State	12.51	31.10	15.49	19.27	11.17	4.43
E.16.3 – Municipal	34.10	38.98	40.57	26.76	32.31	33.26
E.16.4 – Private, profitable	29.98	17.60	28.56	38.36	30.75	29.06
E.16.5 – Private, Non-Profit	19.31	7.55	11.38	10.03	21.90	29.22
E.17 – Number of nurses per hospital bed	15.00	11.80	13.40	10.40	18.60	11.50

Source: MS/SVS/DASIS/CGIAE/Indicators and Health Information (IDB), 2007

Table 86. Coverage indicators

Coverage Indicators	Brazil	North	North-east	Middle West	South-east	South
F.1 - Number of medical appointments (SUS) per inhabitant	2.54	1.98	2.30	2.48	2.88	2.39
F.2 - Number of diagnostic procedures per 100 medical appointments (SUS)						
F.2.1 - Number of clinical pathology diagnostic procedures (SUS) per medical appointment	0.80	1.14	0.71	0.81	0.83	0.71
F.2.2 - Number of imagenology diagnostic procedures (SUS) per medical appointment	0.13	0.15	0.10	0.12	0.15	0.12
F.3 - Number of hospitalizations (SUS) per inhabitant	6.07	6.68	6.22	6.92	5.45	6.76
F.5 - Proportion of hospitalizations (SUS) per specialty						
F.5.1 – Clinical Medicine	33.13	28.66	29.08	39.87	33.46	38.42
F.5.2 – Surgery	27.55	21.80	24.97	23.39	30.99	29.13
F.5.3 – Obstetrics	22.06	28.79	26.64	19.55	20.23	16.03
F.5.4 – Pediatrics	14.18	20.12	16.78	13.89	11.56	12.76
F.5.5 – Psychiatry	2.44	0.49	1.94	2.41	2.98	3.12
F.5.6 – Psychiatry - hospital-day	0.22	0.03	0.19	0.24	0.20	0.41
F.5.7 – Other specialties	0.42	0.11	0.40	0.65	0.59	0.12
F.6 – Coverage of prenatal medical appointments						
F.6.1 – No appointments	2.59	6.17	3.68	1.69	1.42	1.21
F.6.2 - 1 to 3 appointments	9.30	17.51	13.42	7.44	5.49	5.54
F.6.3 - 4 to 6 appointments	34.48	47.22	46.92	31.10	25.21	24.90
F.6.4 – 7 or more appointments	53.63	29.09	35.98	59.77	67.88	68.34
F.7 - Proportion of hospital births	97.07	90.76	95.28	99.32	99.10	99.00
F.8 - Proportion of caesarian births	44.15	35.01	33.00	49.63	51.88	49.82
F.10 - Ratio between informed and estimated live births	92.06	95.12	85.22	96.09	94.13	99.31
F.11 - Razão entre óbitos informados e estimados						
F.11.1 – Total deaths	87.79	76.36	71.85	90.30	96.93	99.00
F.11.2 – Deaths under age 1	70.54	77.70	55.37	89.14	84.79	84.69
F.13 – Vaccine Coverage						
F.13.1 - Diphtheria, pertussis and tetanus - DTP (3 doses)	100.49	104.06	104.05	100.70	97.52	98.01
F.13.2 – Measles (1 dose)	102.02	107.79	105.96	102.57	98.76	97.57
F.13.3 - Poliomyelitis (3 doses)	110.03	131.57	115.72	107.67	103.88	99.13
F.13.4 - Tuberculoses - BGC (1 dose)	97.38	100.00	100.11	96.56	95.65	94.5
F.13.5 - Hepatitis B (3 doses)	102.57	108.88	106.10	102.15	99.93	97.37
F.15 – Health Plan Coverage	24.55	14.83	12.07	24.74	32.86	27.90
F.16 - Private health plan coverage	19.92	6.62	8.67	12.9	31.54	18.04
F.17 - Water supply coverage						
F.17.1 – Urban	92.66	69.02	90.85	89.33	97.03	95.04
F.17.2 – Rural	27.39	16.92	29.32	15.57	29.01	31.92
F.17.3 - Total	81.77	56.31	73.28	79.34	91.65	84.23
F.18 – Sewerage coverage						
F.18.1 - Urban	77.85	60.31	61.51	49.64	91.52	83.3
F.18.2 - Rural	20.27	19.67	9.76	6.71	30.57	45.17
F.18.3 - Total	68.24	50.4	46.74	43.83	86.7	76.77
F.19 – Garbage collection coverage						
F.19.1 - Urban	97.15	92.82	92.96	98.72	99.04	99.23
F.19.2 - Rural	24.63	19.20	14.51	20.14	41.77	39.42
F.19.3 - Total	**85.05**	**74.87**	**70.56**	**88.07**	**94.51**	**88.99**

Source: MS/SVS/DASIS/CGIAE/Indicators and Health Information (IDB), 2007

North Region: Acre, Amapá, Amazonas, Pará, Rondônia, Roraima and Tocantins
Northeast Region: Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí, Rio Grande do Norte and Sergipe
Southeast Region: Espírito Santo, Minas Gerais, Rio de Janeiro and São Paulo
South Region: Paraná, Rio Grande do Sul and Santa Catarina
Middle West Region: Brasilia, Goiás, Mato Grosso and Mato Grosso do Sul

Table 87. Social and economic indicators

Social and Economic Indicators	Brazil	North	North-east	Middle West	South-east	South
B.1 - Illiteracy Rate (% of population aged 15 and older)						
B.1 - total	10.38	11.30	20.74	8.27	5.98	5.67
B.1.1 - Male Population	10.65	12.00	22.82	8.28	5.25	5.27
B.1.2 - Female Population	10.14	10.61	18.81	8.26	6.64	6.04
B.2 – Education Levels (% of population aged 15 and older)						
B.2.1 – less than 1 year of school	11.18	13.31	20.22	9.76	7.19	6.64
B.2.2 - 1 to 3 years of school	11.08	12.45	14.31	10.31	9.39	10.04
B.2.3 - 4 to 7 years of school	26.75	27.32	26.34	27.54	25.77	29.73
B.2.4 - 8 and more years of school	50.99	46.93	39.14	52.39	57.64	53.59
B.3 - GDP per capita	11,658,11	7,247,02	5,498,02	14,604,44	15,467,82	13,207,81
B.4 – Income Ratio	20.89	15.23	20.7	18.08	16.64	14.65
B.5 - Proportion of Poor people	33.12	46.08	55.77	27.38	21.27	19.81
B.6 – Unemployment Rate	8.42	7.07	8.29	8.35	9.63	5.98
B.7 – Rate of Child Labor	11.73	14.63	16.65	9.12	6.79	13.84

Source: MS/SVS/DASIS/CGIAE/Indicators and Health Information (IDB), 2007

North Region: Acre, Amapá, Amazonas, Pará, Rondônia, Roraima and Tocantins
Northeast Region: Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí, Rio Grande do Norte and Sergipe
Southeast Region: Espírito Santo, Minas Gerais, Rio de Janeiro and São Paulo
South Region: Paraná, Rio Grande do Sul and Santa Catarina
Middle West Region: Brasilia, Goiás, Mato Grosso and Mato Grosso do Sul

Apendix

Chart 4. Description of death causes and respective abbreviations

Names	Abreviations
I. Certain Infectious and Parasitic Diseases	Infectious and Parasitic
II. Neoplasms (tumors)	Neoplasms
III. Diseases of the Blood and Blood-Forming Organs and Certain Disorders Involving the Immune Mechanism	Hematopoietic Diseases
IV. Endocrine, Nutritional and Metabolic Diseases	Endocrinal Diseases
V. Mental and Behavioral Disorders	Mental Disorders
VI. Diseases of the Nervous System	Nervous System
VII. Diseases of the Eye and Annexa	Eye and Annexa
VIII. Diseases of the Ear and Mastoid Process	Ear Diseases
IX. Doenças do Circulatory System	Circulatory System
X. Diseases of the Respiratory System	Respiratory System
XI. Diseases of the Digestive System	Digestive System
XII. Diseases of the Skin and Subcutaneous Tissue	Skin and Subcutaneous Tissue
XIII. Diseases of the Musculoskeletal System and Connective Tissue	Musculoskeletal System
XIV. Diseases of the Genitourinary System	Genitourinary System
XV. Pregnancy, Childbirth and the Puerperium	Childbirth and Puerperium
XVI. Certain Conditions Originating in the Perinatal Period	Perinatal Conditions
XVII. Congenital Malformations, Deformations and Chromosomal Abnormalities	Congenital Malformations
XVIII. Symptoms, Signs and Abnormal Clinical and Laboratory Findings, Not Elsewhere Classified	Poorly Defined
XIX. Injury, Poisoning and Certain Other Consequences of External Causes	Injury, Poisoning
XX. External Causes of Morbidity and Mortality	External causes
XXI. Factors Influencing Health Status and Contact With Health Services	-

Table 88. Censitary Population and Percentage of Children and Adolescents by sex, Brazil and Regions 2000

Population	Total			Male			Female		
	0-80 or more	0-18	%	0-80 or more	0-18	%	0-80 or more	0-18	%
Brazil	169,799,170	64,720,115	38.1	83,576,015	32,779,140	39.2	86,223,155	31,940,975	37.0
North	12,900,704	6,043,382	46.8	6,533,555	3,064,036	46.9	6,367,149	2,979,346	46.8
Northeast	47,741,711	20,273,458	42.5	23,413,914	10,250,495	43.8	24,327,797	10,022,963	41.2
Middle West	11,636,728	4,571,433	39.3	5,801,005	2,266,379	39.1	5,835,723	2,206,744	37.8
Southeast	72,412,411	25,040,699	34.6	35,426,091	12,674,873	35.8	36,986,320	12,365,826	33.4
South	25,107,616	8,889,453	35.4	12,401,450	4,523,357	36.5	12,706,166	4,366,096	34.4

Sources: MP/Fundação Instituto Brasileiro de Geografia e Estatística (IBGE)
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