FLORIDA CANCER DATA SYSTEM
SYLVESTER COMPREHENSIVE CANCER CENTER

UNIVERSITY OF MIAMI MILLER SCHOOL OF MEDICINE

PEDIATRIC CANCER IN FLORIDA

1981-2007

Florida Cancer Data System
University of Miami Miller School of Medicine
Miami, Florida
2011

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INTRODUCTION

This publication is a description of pediatric cancers in Florida and is a follow-up to the first comprehensive publication of pediatric cancers in Florida printed in 2008[1]. This report is a joint project of the Center for Disease Control and Prevention, National Program of Cancer Registries, and the Florida Cancer Data System. Provided in this report are descriptions of cancer incidence among children and adolescents aged 0 to 19 years old in Florida from the years 1981 to 2007. An analysis of pediatric mortality is presented for all cancers combined for the same time period. Important to note are the changes made by the World Health Organization, since the last report, to the International Classification of Childhood Cancers. Therefore, not all figures in this report are comparable to classifications in the last publication on pediatric cancers.

Childhood cancer is a diverse group of rare malignancies, varying widely in histology and anatomical site. Overall, pediatric cancer incidence rates in Florida are comparable to the rest of the United States. In Florida, pediatric cancers accounted for 7% of all diagnosed cancers between the years 1981 and 2007. For this period, the age-adjusted incidence rate was 159 per million children, and the mortality rate was 30.8 per million. Average incidence rate trends show a gradual increase in pediatric cancers over time with decreasing trends in overall pediatric mortality due to cancer.

Reference List

1. Pinheiro PS, Button JH, Fleming LE, Huang Y, Wohler B, MacKinnon JA, Wilkinson JD. Pediatric Cancer in Florida: 1981-2000. Miami: Florida: Florida Cancer Data System, 2008.

Table 1. Percent of ICCC Category and Subcategory by Age, Florida, 1981-2007

	0-4	5-9	10-14	15-19	<15	<20
All Sites Combined - Number of Cases	5,154	2,793	3,039	4,710	10,986	15,696
All Sites Combined	100.0	100.0	100.0	100.0	100.0	100.0
I Leukemias, myeloproliferative & myelodysplastic diseases	34.7	32.9	21.3	14.5	30.5	25.7
I(a) Lymphoid leukemias	28.5	26.3	14.6	7.4	24.1	19.1
I(b) Acute myeloid leukemias	4.1	4.3	4.7	4.9	4.3	4.5
I(c) Chronic myeloproliferative diseases	0.5	0.9	0.8	1.3	0.7	0.9
I(d) Myelodysplastic syndrome and other myeloproliferative	0.3	0.3	0.4	0.1	0.3	0.3
I(e) Unspecified and other specified leukemias	1.3	1.1	0.8	0.8	1.1	1.0
II Lymphomas and reticuloendothelial neoplasms	5.3	13.7	18.5	24.4	11.1	15.1
II(a) Hodgkin lymphomas	0.3	3.3	8.9	15.8	3.4	7.1
II(b) Non-Hodgkin lymphomas (except Burkitt lymphoma)	1.9	5.5	6.1	6.5	4.0	4.7
II(c) Burkitt lymphoma	1.1	3.8	2.2	0.8	2.1	1.7
II(d) Miscellaneous lymphoreticular neoplasms	1.7	0.4	0.2	0.1	0.9	0.7
II(e) Unspecified lymphomas	0.4	0.6	1.2	1.3	0.7	0.8
III CNS and misc intracranial and intraspinal neoplasms	17.4	27.5	21.3	10.1	21.1	17.8
III(a) Ependymomas and choroid plexus tumor	1.9	1.3	1.6	0.8	1.7	1.4
III(b) Astrocytomas	7.8	13.2	11.7	5.7	10.3	8.9
III(c) Intracranial and intraspinal embryonal tumors	4.5	6.3	3.3	1.2	4.6	3.6
III(d) Other gliomas	2.3	4.8	3.7	1.7	3.3	2.8
III(e) Other specified intracranial/intraspinal neoplasms	0.3	0.8	0.3	0.3	0.4	0.4
III(f) Unspecified intracranial and intraspinal neoplasms	0.7	1.1	0.7	0.6	0.8	0.7
IV Neuroblastoma and other peripheral nervous cell tumors	13.1	3.0	0.9	0.6	7.2	5.2
IV(a) Neuroblastoma and ganglioneuroblastoma	13.0	2.9	0.7	0.4	7.0	5.0
IV(b) Other peripheral nervous cell tumors	0.1	0.1	0.2	0.2	0.1	0.2
V Retinoblastoma	6.4	0.5	0.0	0.0	3.1	2.2
VI Renal tumors	9.7	4.7	1.3	0.7	6.1	4.5
VI(a) Nephroblastoma and other nonepithelial renal tumors	9.6	4.6	0.7	0.2	5.9	4.2
VI(b) Renal carcinomas	0.1	0.1	0.6	0.5	0.2	0.3
VI(c) Unspecified malignant renal tumors	0.1	0.0	0.0	0.0	0.0	0.0
VII Hepatic tumors	2.2	0.4	0.7	0.6	1.3	1.1
VII(a) Hepatoblastoma	2.0	0.2	0.2	0.0	1.0	0.7
VII(b) Hepatic carcinomas	0.1	0.2	0.5	0.5	0.2	0.3
VII(c) Unspecified malignant hepatic tumors	0.0	0.0	0.0	0.0	0.0	0.0
VIII Malignant bone tumors	0.5	5.3	11.6	8.8	4.8	6.0
VIII(a) Osteosarcomas	0.1	2.7	6.4	5.2	2.5	3.3
VIII(b) Chondrosarcomas	0.0	0.0	0.3	0.4	0.1	0.2
VIII(c) Ewing tumor and related sarcomas of bone	0.3	2.3	4.2	2.6	1.9	2.1
VIII(d) Other specified malignant bone tumors	0.1	0.2	0.5	0.5	0.2	0.3
VIII(e) Unspecified malignant bone tumors	0.0	0.1	0.2	0.1	0.1	0.1
IX Soft tissue and other extraosseous sarcomas	6.2	7.7	9.1	7.6	7.4	7.5
IX(a) Rhabdomyosarcomas	3.6	4.2	3.1	2.1	3.6	3.1
IX(b) Fibrosarcomas, peripheral nerve & other fibrous	0.5	0.8	1.1	1.1	0.7	0.9
IX(c) Kaposi sarcoma	0.8	0.1	0.1	0.2	0.4	0.4
IX(d) Other specified soft tissue sarcomas	0.9	1.8	3.6	3.2	1.9	2.3
IX(e) Unspecified soft tissue sarcomas	0.4	0.8	1.3	1.1	0.8	0.9
X Germ cell & trophoblastic tumors & neoplasms of gonads	2.7	1.5	5.3	11.9	3.1	5.8
X(a) Intracranial & intraspinal germ cell tumors	0.3	0.7	1.3	0.8	0.7	0.7
X(b) Extracranial & extragonadal germ cell tumors	1.2	0.1	0.3	1.2	0.7	0.8
X(c) Malignant gonadal germ cell tumors	1.1	0.7	3.2	8.3	1.6	3.6
X(d) Gonadal carcinomas	0.0	0.0	0.2	1.2	0.0	0.4
X(e) Other and unspecified malignant gonadal tumors	0.1	0.0	0.2	0.4	0.1	0.2
XI Other malignant epithelial neoplasms and melanomas	1.0	1.9	9.2	19.6	3.5	8.3
XI(a) Adrenocortical carcinomas	0.3	0.1	0.1	0.1	0.2	0.2
XI(b) Thyroid carcinomas	0.1	0.6	3.2	7.3	1.1	2.9
XI(c) Nasopharyngeal carcinomas	0.0	0.1	0.7	0.9	0.2	0.4
XI(d) Malignant melanomas	0.3	0.6	2.6	5.8	1.0	2.5
XI(e) Skin carcinomas	0.0	0.0	0.1	0.0	0.0	0.0
XI(f) Other and unspecified carcinomas	0.4	0.5	2.5	5.5	1.0	2.3
XII Other and unspecified malignant neoplasms	0.7	0.8	0.6	0.8	0.7	0.7
XII(a) Other specified malignant tumors	0.1	0.1	0.1	0.2	0.1	0.2
XII(b) Other unspecified malignant tumors	0.5	0.7	0.5	0.6	0.6	0.6

MATERIALS AND METHODS

STRUCTURE OF THE REPORT

This report begins with a chapter on all cancer sites combined as a single group in Floridians under age 20, and describes incidence, mortality, and respective trends in the pediatric age group. The remainder of the report includes chapters for each type of pediatric cancer, with the exception of other and unspecified malignant neoplasms. These cancer types are designated by the International Classification of Childhood Cancers (ICCC)[1], and include the recent changes instituted in 2008 on tumors of the hematopoietic and lymphoid tissues[2]. Descriptions of incidence rates and trends are presented in each chapter with specific rates by sex and race. In addition, comparison to rates in the SEER 9 region are reported by sex and race combined.

SOURCES OF DATA

Incidence

Cancer incidence data are collected, verified, and maintained by the Florida Cancer Data System (FCDS), Florida's statewide cancer incidence registry. The FCDS is administered by the Florida Department of Health (FDOH) and operated by the Sylvester Comprehensive Cancer Center at the University of Miami Miller School Of Medicine with funding from the Florida Department of Health and from the Centers for Disease Control and Prevention's (CDC) National Program for Cancer Registries (NPCR). Statewide collection of cancer incidence began in 1981. Data are collected from hospitals, freestanding ambulatory surgical centers, radiation therapy facilities, pathology laboratories, and dermatopathologists' offices. More information can be found at www.fdcs.med.miami.edu. SEER data are obtained from the SEER 9 Regs Research Database that covers the diagnosis years 1973 to 2007.

Mortality

Cancer mortality in Florida is based on cancer appearing as the underlying cause of death on death certificates obtained from the Florida Department of Vital Statistics. Cancer mortality is coded according to the International Classification of Diseases-9th edition. SEER mortality data are obtained from public use files provided by the National Center for Health Statistics (NCHS) and cover all deaths in the United States.

Data Limitations

The coding for cancer incidence and mortality data are derived from different sources and coding schemes. Cancer incidence data are abstracted using the International Classification of Disease for Oncology, Version 3 (ICD-O-3)[4] and are designated by anatomical site and tumor morphology. Childhood cancers are coded mainly by tumor morphology and follow the International Classification of Childhood Cancer (ICCC). Mortality data are coded according to the International Classification of Diseases (ICD-9) and are not strictly comparable to categories produced using the ICCC. Therefore, the comparison between pediatric incidence and mortality should be taken with caution. For more detailed discussion please refer to the 2008 Pediatric Report [4].

Population

Florida population estimates for the years 1981 to 2007 are provided by the Florida Consensus Estimating Conference. In 2007 there were 3,244,841 Florida children younger than 15 years of age residing in the state and 4,428,563 younger than 20 years of age.

RATE CALCULATIONS

Incidence and Mortality Rates
Pediatric cancer incidence and mortality rates are calculated by taking the total number of newly diagnosed invasive cancer cases, or cancer deaths, over the total number of children in the population within a specific time period, and are expressed as per one million children. Rates can be computed by cancer type and for specific sub-populations. All incidence and mortality rates are age-adjusted to the 2000 US standard million population, with the exception of reported age-specific rates, which are presented as age-specific crude rates.

CLASSIFICATION OF SITE AND HISTOLOGIC TYPE

FCDS classified classes in this report by cancer site and histologic type using the International Classification of Disease for Oncology, Second Edition (ICD-O-2)[5], where categorizations of tumors are primarily by anatomical site, in contrast to the ICCC where cancers are primarily grouped by histologic type. Data in this report have been grouped according to the SEER modification of the ICCC specifications.

ICCC CATEGORIES AND SUBCATEGORIES

ICCC categories refer to broad groups of cancers, e.g., leukemia, comprising distinct diseases such as ALL and AML. ICCC subcategories refer to these more specific entities. In some graphs and tables, the data are presented for ICCC subcategories when ICCC categories alone do not describe the findings with enough detail.

OTHER TECHNICAL DEFINITIONS

Age-adjusted rates: Pediatric incidence and mortality rates are expressed as age-adjusted number of cases or deaths per million person years under age 20. For simplicity, these are referred to as “rates per million”. Rates are age-adjusted to the 2000 US standard million population.

Age groups: The age group studied and described in this report covers children between the ages of 0 to 19, divided into 5-year segments: 0-4, 5-9, 10-14, and 15-19. In this report the term pediatric refers to the entire age group (0-19), childhood to 0-14; adolescence 15-19; early childhood 0-4; late childhood 10-14, and infants are less than 1 year old.

Age-specific rates: Age-specific rates are presented as cases or deaths per million population, per year. The numerator of the rates is the number of cancer cases or deaths found in a particular 5-year age group in a defined population divided by the number of individuals in the same 5-year age group in that population and calendar year.

ICCC Classification: At the time the World Health Organization’s (WHO) International Agency for Research on Cancer (IARC) published the first monograph on Childhood Cancer in 1988, which included a classification scheme for childhood cancers. These schemes were chiefly based on histologic type. Since the original publication, modifications have been made and are now referred to as the International Classification of Childhood Cancers[1].

Mortality rate: The pediatric mortality rate is the number of deaths with cancer given as the underlying cause of death occurring in a specified population during a year, expressed as the number of deaths due to cancer per one million people. This rate can be computed for each type of cancer as well as for all cancers combined. Except for age-specific rates, al mortality rates are age-adjusted to the 2000 US standard million population.

SEER Program: Data from the SEER-9 registries were used to compute incidence and survival rates to compare with Florida by age group, sex and race. The SEER program began in 1973 as an outgrowth of the NCI’s Third National Cancer Survey.

NCI contracts with various medically-oriented non-profit organizations, local city or state Health Departments or Universities for collection of these data. The SEER-9 registries are comprised of the entire state of Connecticut, Iowa, New Mexico, Utah, and Hawaii, and the metropolitan areas of Detroit, Michigan; San Francisco-Oakland, California; Seattle-Puget Sound, Washington; and Atlanta, Georgia. These organizations collect data on all cancers except basal and squamous cell skin cancers. Only residents of the areas designated above are included so that the population base can be properly determined. The SEER rates in his report were calculated from the SEER public use dataset with SEER*Stat[6].

Reference List

1. Kramorova E, Stiller CA, Ferlay J, et al. International Classification of Childhood Cancer, IARC Technical Report no. 29. Lyon: international Agency for Research on Cancer; 1996.

2. World Health Organization (WHO). (2008). WHO Classification of Tumours of Haematopoietic and Lymphoid Tissues, Fourth edition. The International Agency for Research on Cancer. Edited by Swerdlow, S.H., Campo, E., Harris, N.L., Jaffe, E.S., Pileri, S.A., Stein, H., Thiele, J., Vardiman, J.W.

3. Fritz A, Percy C, Jack A, et al (eds). International Classification of Diseases for Oncology, Third Edition. Geneva, Switzerland: World Health Organization; 2000.

4. Pinheiro PS, Button JH, Fleming LE, Huang Y, Wohler B, MacKinnon JA, Wilkinson JD. Pediatric Cancer in Florida: 1981-2000. Miami: Florida: Florida Cancer Data System, 2008

5. Percy C, Van Holten V, Muir C (eds). International Classification of Disease for Oncology, Second Ed. Geneva: World Health Organization; 1990.

6. Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gove) SEER*Stat Database: Incidence – SEER 9 Regs Research Data, Nov 2009 Sub (1973-2007), Katrina/Rita Population Adjustment.

ALL CANCERS COMBINED

Incidence

Figure 1 displays the distribution of pediatric cancers by specific cancer type. Among all pediatric cancers, leukemia is the leading cause of all pediatric cancers consisting of 25.7 percent of diagnoses, followed by CNS tumors (17.8%), and lymphomas (15.1%). The age-adjusted incidence rate for cancer diagnosed in this study period (Table 4) was 159.6 per million children. The percent distribution of childhood and adolescent cancer by ICCC group and age group is presented in Table 1. The age-adjusted incidence for the top pediatric cancers is shown in Figure 8.

Figure 1. Number of Pediatric Cancers by ICCC Category and Age, Florida, 1981-2007

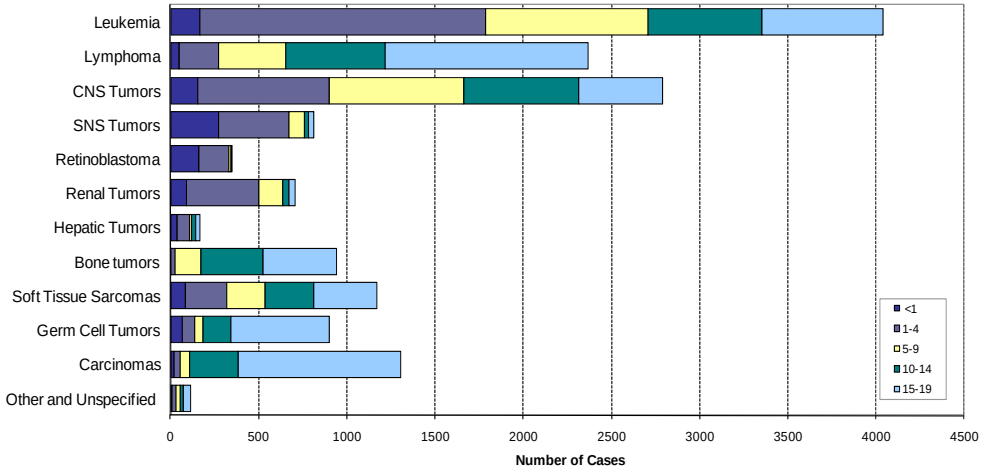


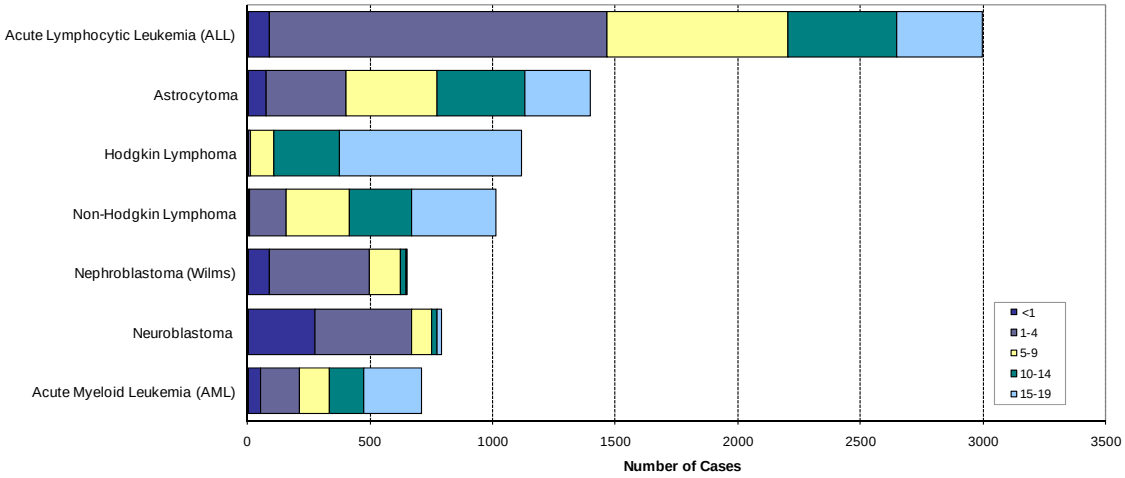
Table 3. Demographic Characteristics of Children with Cancer, Florida, 1981-2007

	Number of Cases	Percent
Number of Children	15,696	100.0
Age		
0-4	5,154	32.8
5-9	2,793	17.8
10-14	3,039	19.4
15-19	4,710	30.0
Sex		
Female	7,171	45.7
Male	8,524	54.3
Race		
White	12,582	80.2
Black	2,711	17.3
Other	266	1.7

AGE

Table 3 depicts the distribution of cases by age group, sex, and race. During the study period most childhood cancers (33%) were diagnosed among children between the ages of 0 to 4 with the fewest cases occurring among those between the ages of 5 to 9 (18%). Acute lymphocytic leukemia (ALL) was the most common cancer in all age groups up to age 14. For children ages 0 to 4 neuroblastoma, astrocytoma, Wilms tumor and retinoblastoma followed leukemia as the leading causes. Lymphomas (25%) were primarily diagnosed among adolescents, and were more common in older age groups than in young children. Figures 2 and 3 depict the distribution of leading pediatric cancers by age group.

Figure 2. Number of Pediatric Cancers by ICCC Subcategory and Age, Florida, 1981-2007



SEX

Pediatric cancer cases were more common in males (51.3%) than in females (48.7%) for all sites combined and across all age categories. Incidence rates by age group and sex are shown in Figure 4. The greatest difference between sexes occurs between the ages of 0 to 4, with a rate of 231 per million for males, and 196 for females.

In Table 5, incidence rates are depicted by ICCC category and sex. Leukemia is the leading cause of cancer among both sexes but are much higher among males (46 per million) than in females (36 per million). Renal tumors were elevated among females (8 per million) compared to males (6 per million), as well as other carcinomas (17 versus 10 per million respectively).

RACE

The proportion of pediatric cancers predominates among children classified as White (80%) over those classified as Black (17%). The remaining cases occurred in children classified as other race. Incidence rates are shown in Figure 6. Pediatric Incidence rates in Whites (170 per million) were higher than in Blacks (128 per million). Common cancers continue to occur more among White children than Black children, with the greatest difference occurring in leukemia incidence rates (45 versus 28 per million, respectively). In contrast, rates of renal tumors and soft-tissue sarcomas were higher in Blacks than in Whites. Rates are shown in Figure 9.

Figure 3. Age-Specific Incidence Rates of Leading Pediatric Cancers, Florida, 1981-2007

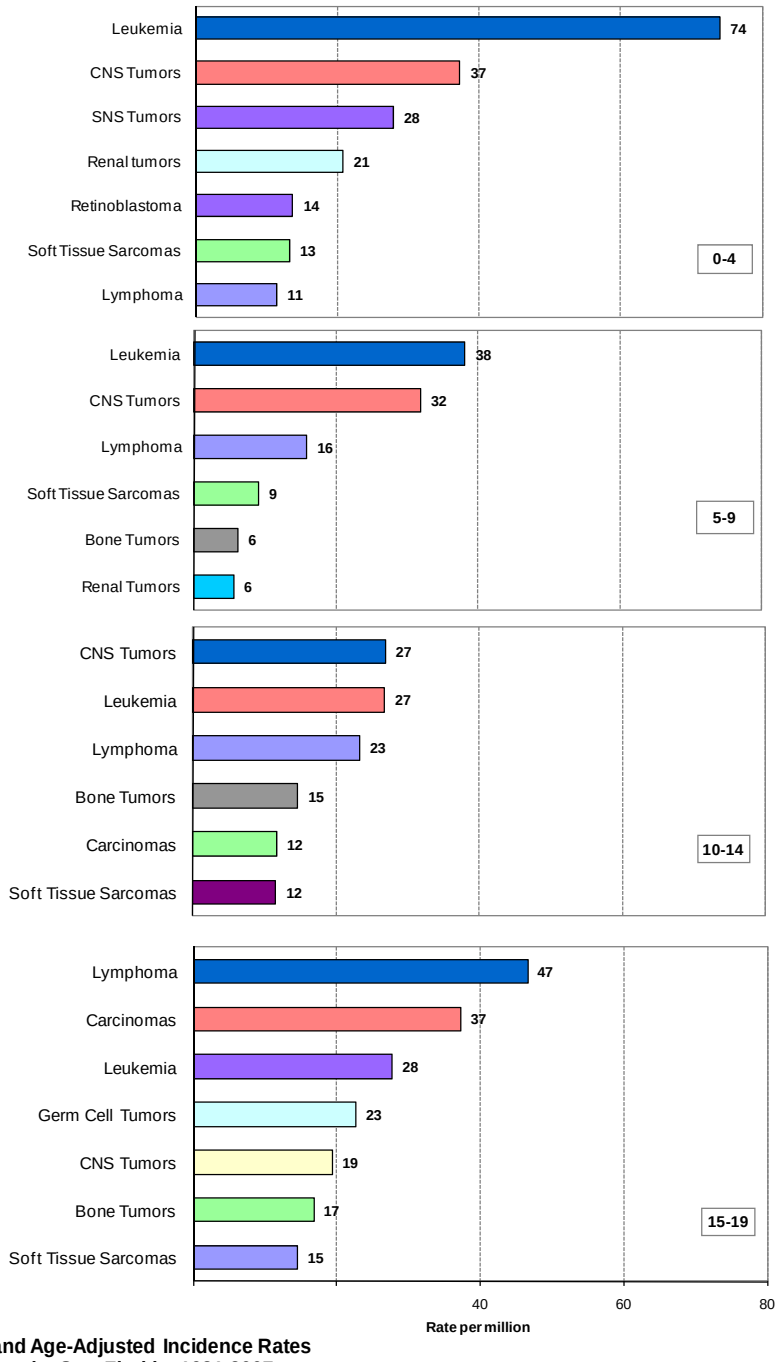
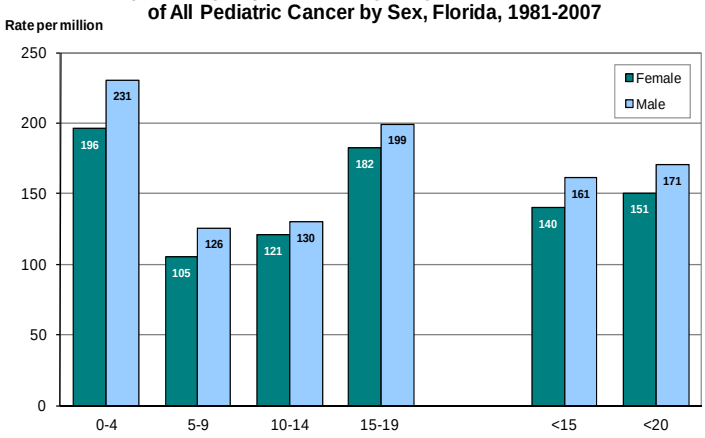


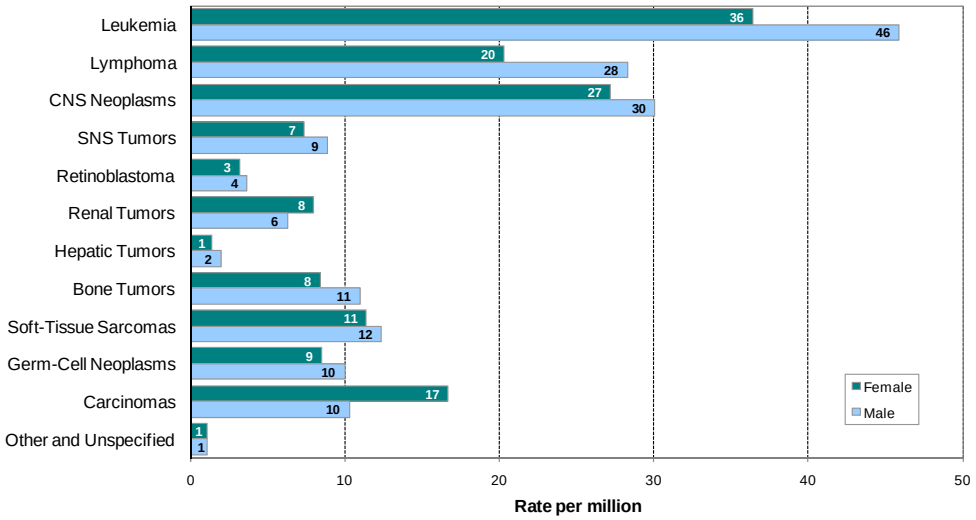
Figure 4. Age-Specific and Age-Adjusted Incidence Rates of All Pediatric Cancer by Sex, Florida, 1981-2007



ICCC CATEGORIES

Age adjusted incidence rates among the twelve ICCC categories (Figure 8) were highest for leukemias (41 per million), CNS neoplasms (29 per million), and lymphomas (24 per million). Across ICCC subcategories ALL leads in the total number of cases, followed by astrocytoma and Hodgkin lymphoma.

Figure 5. Age-Adjusted Incidence Rates of All Pediatric Cancer by ICCC Category and Sex, Florida, 1981-2007



FLORIDA AND SEER COMPARISONS

For the period between 1981 and 2006 Florida pediatric all-cause incidence rates are comparable to SEER-9 Rates by race and sex (Figure 7). Incidence rates for specific sites are shown in Table 4 by race. Rates for all sites combined and Hodgkin lymphomas were lower among Blacks and Whites in Florida compared to the SEEER pouplation. Rates were higher in Florida for leukemia among Whites and for Ewing Sarcoma among Blacks compared to the SEER-9 area rates.

Figure 6. Age-Specific and Age-Adjusted Incidence Rates of All Pediatric Cancer by Race, Florida, 1981-2007

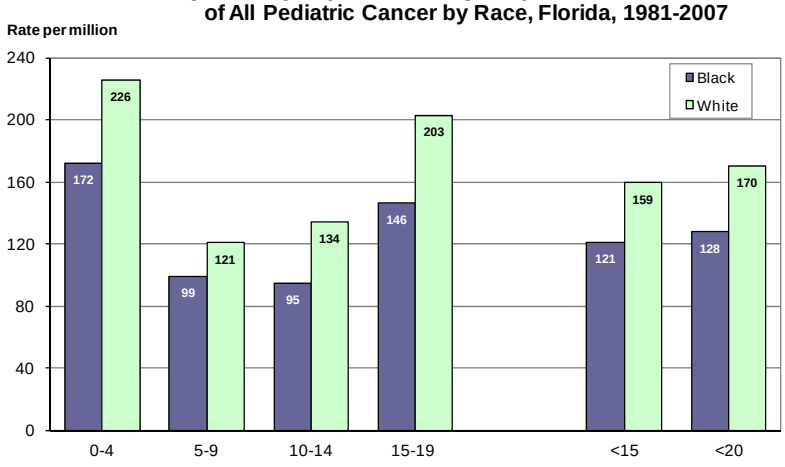


Figure 7. Age-Adjusted Incidence Rates of All Pediatric Cancer by Sex and Race, Florida and SEER, 1981-2006

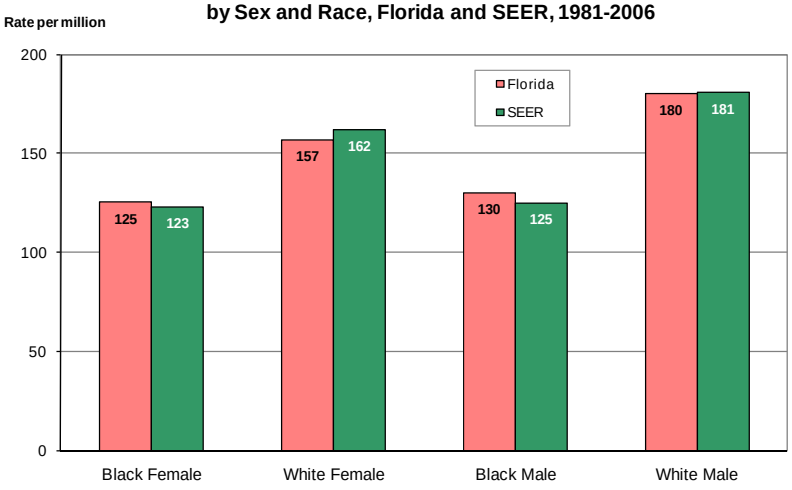


Table 4. FCDS and SEER Age Adjusted Incidence Rates of Pediatric Cancer, 1981-2006			
Significantly Lower Rates in Florida		Florida Rate (95% CI)	SEER-9 Rate (95% CI)
All Sites Combined	All Races	159.6 (157.1-162.2)	179.8 (177.9-181.7)
All Sites Combined	Whites	169.0 (165.8-171.9)	188.5 (186.2-190.7)
All Sites Combined	Blacks	127.7 (123.0-132.7)	139.3 (134.8-144.0)
Hodgkin Lymphoma	All Races	11.4 (10.7-12.1)	12.7 (12.2-13.2)
Hodgkin Lymphoma	Whites	13.0 (11.9-13.5)	14.4 (13.7-145.0)
Hodgkin Lymphoma	Blacks	6.9 (5.8-8.1)	9.5 (8.3-10.8)
Other Specified CNS	Whites	0.5 (0.3-0.7)	1.6 (1.4-1.8)
Gonadal Germ Cell Tumors	All Races	5.7 (5.2-6.2)	6.8 (6.4-7.1)
Thyroid	All Races	4.6 (4.2-5.0)	5.6 (5.2-5.9)
Melanoma	Whites	4.7 (4.2-5.3)	6.4 (6.0-6.9)
Significantly Higher Rates in Florida			
Leukemia	Whites	45.0 (43.1-46.2)	41.6 (40.6-42.7)
Ewing Sarcoma	Blacks	1.1 (0.7-1.7)	0.3 (0.1-0.6)
Unspecfied CNS	Whites	1.1 (0.9-1.4)	0.6 (0.4-0.7)

Figure 8. Age-Adjusted Incidence Rates of All Pediatric Cancer by ICCC Category, Florida, 1981-2007

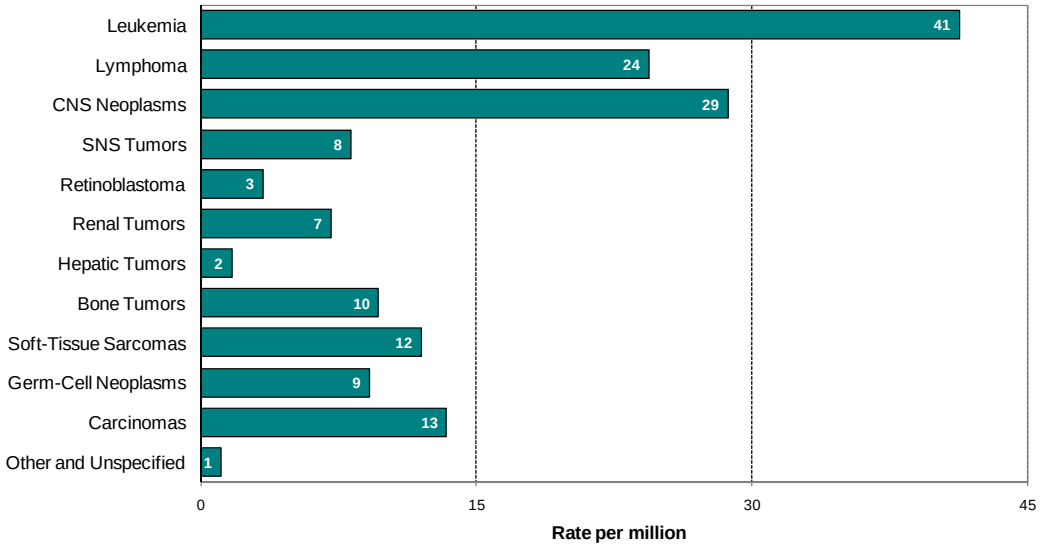
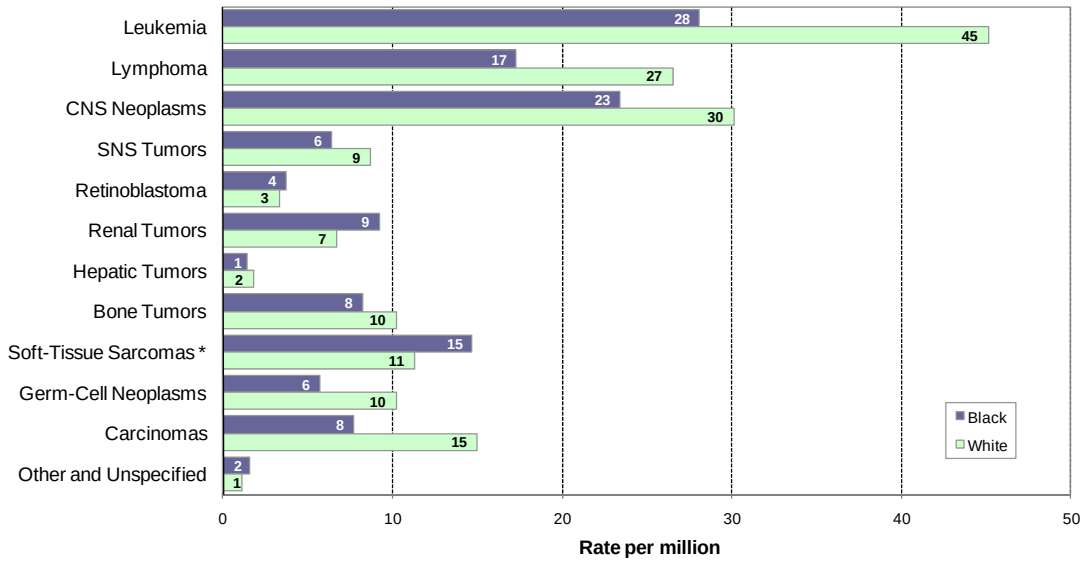


Figure 9. Age-Adjusted Incidence Rates of All Pediatric Cancer by ICCC Category and Race, Florida, 1981-2007



TRENDS

Incidence of all pediatric cancers increased to 183.6 per million in 2007 compared to a rate of 140.2 per million in 1981. Figure 11 shows the trends for top ICCC subcategories, with ALL incidence rates being the most variable over time. Rates were more stable among AML, HL, NHL, and CNS tumors, with a slight reduction in rates for NHL in 2007 from 2000 (11.7 versus 13.67 per million, respectively). Rates for neuroblastoma, thyroid carcinonma and melanoma increased over time (Figure 12) with a large increase in nueroblastoma diagnoses between the years 1994 and 2000. Since the year 2000, the greatest average rate increase occurred in thyroid carcinoma (4.73 versus 7.87 per million).

Figure 10. Trends in Age-Adjusted Pediatric Incidence Rates, Florida, 1981-2007

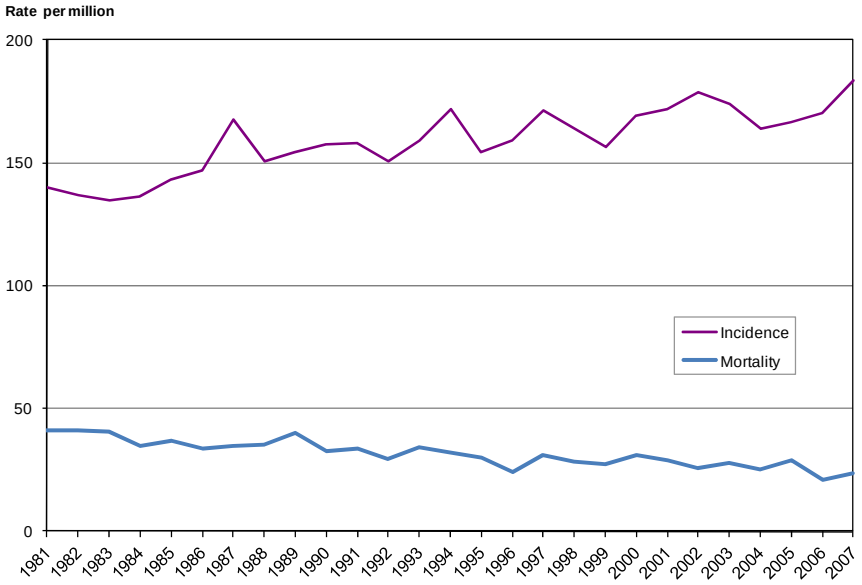


Figure 11. Trends in Age-Adjusted Incidence Rates of ALL, AML, HL, NHL, and CNS Tumors, Florida, 1981-2007

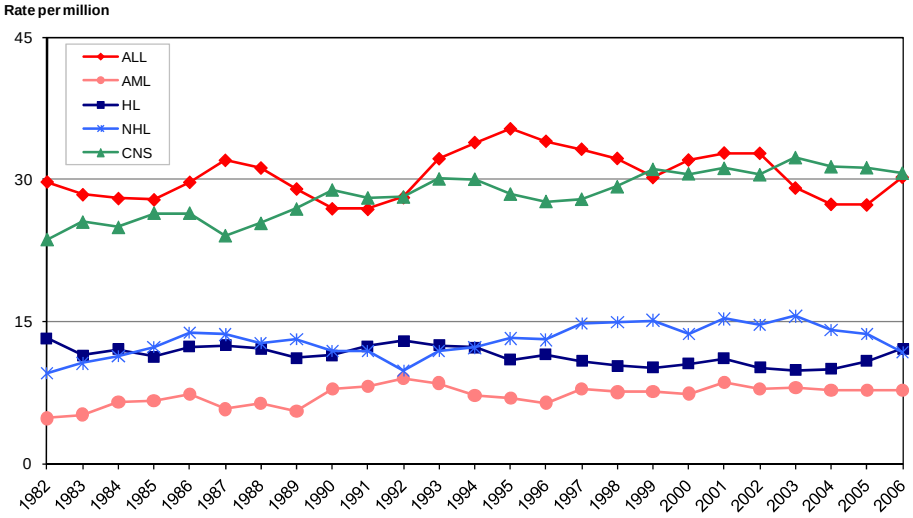
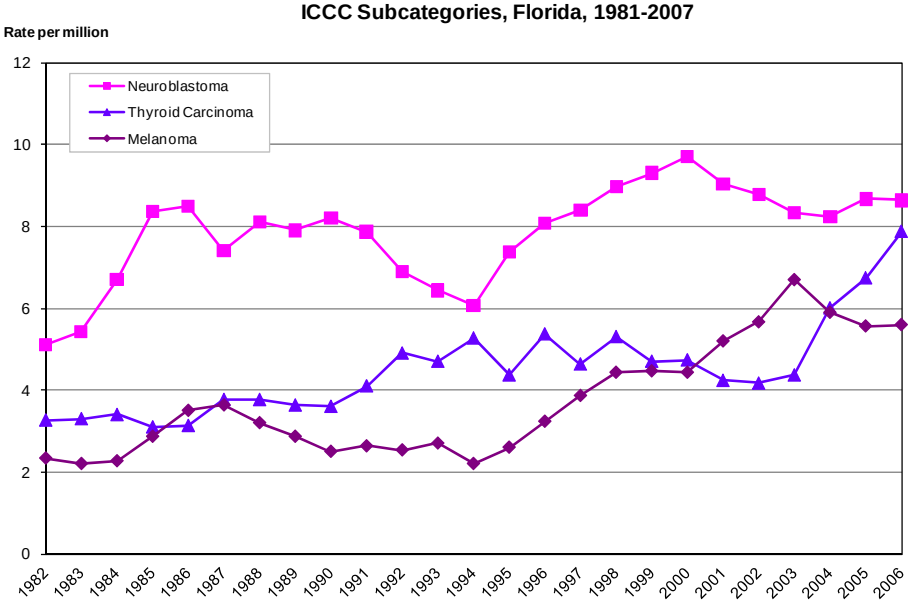


Figure 12. Trends in Age-Adjusted Incidence Rates of ICCC Subcategories, Florida, 1981-2007



MORTALITY

Pediatric cancer mortality rates in Florida have decreased to a rate of 23.4 per million in 2007 from a rate of 40.9 million in 1981. By the year 2007 pediatric mortality rates fell below the U.S. rate of 25.1 per million.

ALL SITES

Since 1981 a total of 2,995 deaths were recorded in Florida among children and adolescents. Leukemia (34%), CNS tumors (23%), and lymphomas (7%) were the top three most common causes of cancer deaths.

AGE

A majority of deaths due to cancer occurred in adolescents. This trend was observed throughout the time period. This is due to the fact that adolescents had higher incidences of AML, NHL, STS and bone cancer. However, mortality rates for this group began to converge with other age groups by the end of the study period. Mortality rates were variable in other age categories, but became more stable and convergent since the year 2000. Mortality trends by age are shown in Figure 19 and rates by age and ICCC category are shown in Figure 20.

Figure 18. Trends in Age-Adjusted Pediatric Mortality Rates, Florida and U.S., 1981-2007

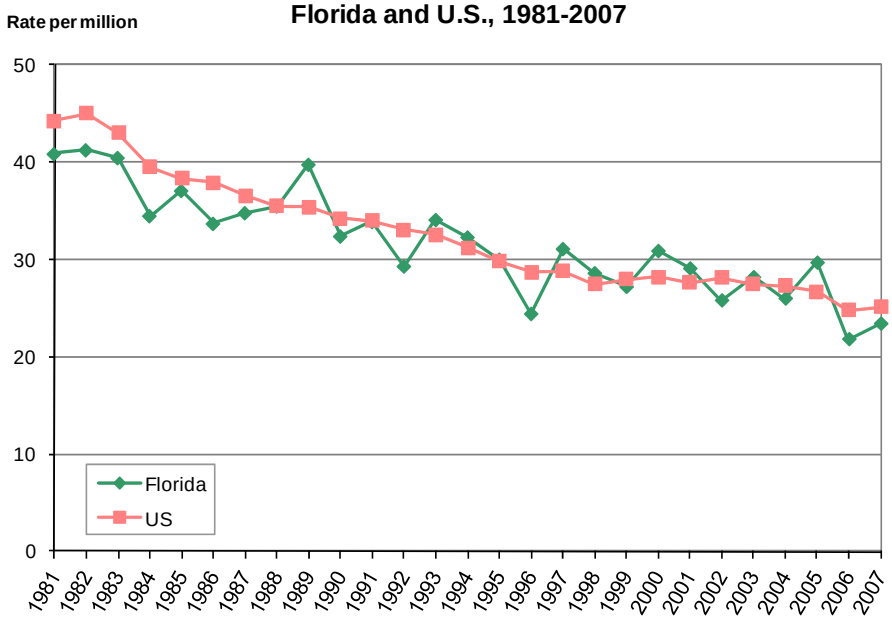
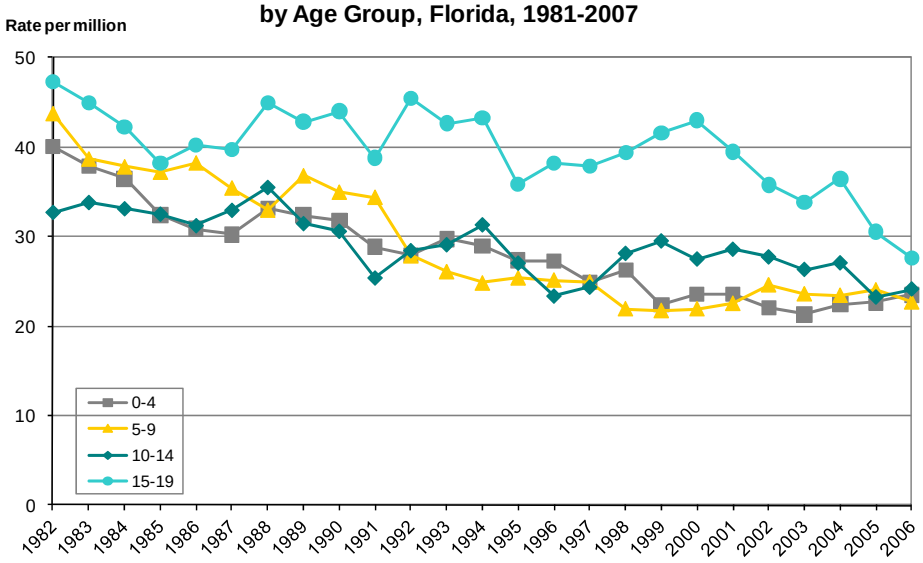


Figure 19. Pediatric Mortality Rates for All Cancers by Age Group, Florida, 1981-2007



AGE 0-4

For this age group, leukemia was the leading cause of death at a rate of 9.8 cases per million, followed by cancer of the brain (7.3 per million), and endocrine cancers (4.5 per million).

AGE 5-9

In contrast to the 0 to 4 age group, cancer of the brain (9.3 per million) was the leading cause of mortality among those in the 5 to 9 age category, followed closely by leukemia (9.0 per million) and endocrine cancers (3.3 per million).

AGE 10-14

Leukemia (10.2 per million) was the most common cause of mortality among this age group followed by cancers of the brain (6.9 per million) and of the bone (3.5 per million). Non-Hodgkin lymphoma and soft-tissue sarcoma were also leading causes of death.

Adolescents

In adolescents leukemia (12.5 per million) was the leading cause of cancer death. Unlike younger children, bone cancer (5.8 per million) was the second leading cause of death in this group.

RACE

With the continued decline in pediatric cancer mortality rates, rates were lower for Blacks and Whites in 2007 than in previous years. Among Blacks the cancer mortality rate for all sites was 31.9 per million cases, down from 43.3 per million in 1981. Similarly, the White mortality rate was lower at 30.8 per million compared to 40.8 per million cases in 1981. Black children persistently died from cancer at a higher rate than did White children. Leukemia continues to be the leading cause of death, with similar rates for both Blacks and Whites, followed by cancer of the brain and CNS.

MAIN CAUSES OF DEATH

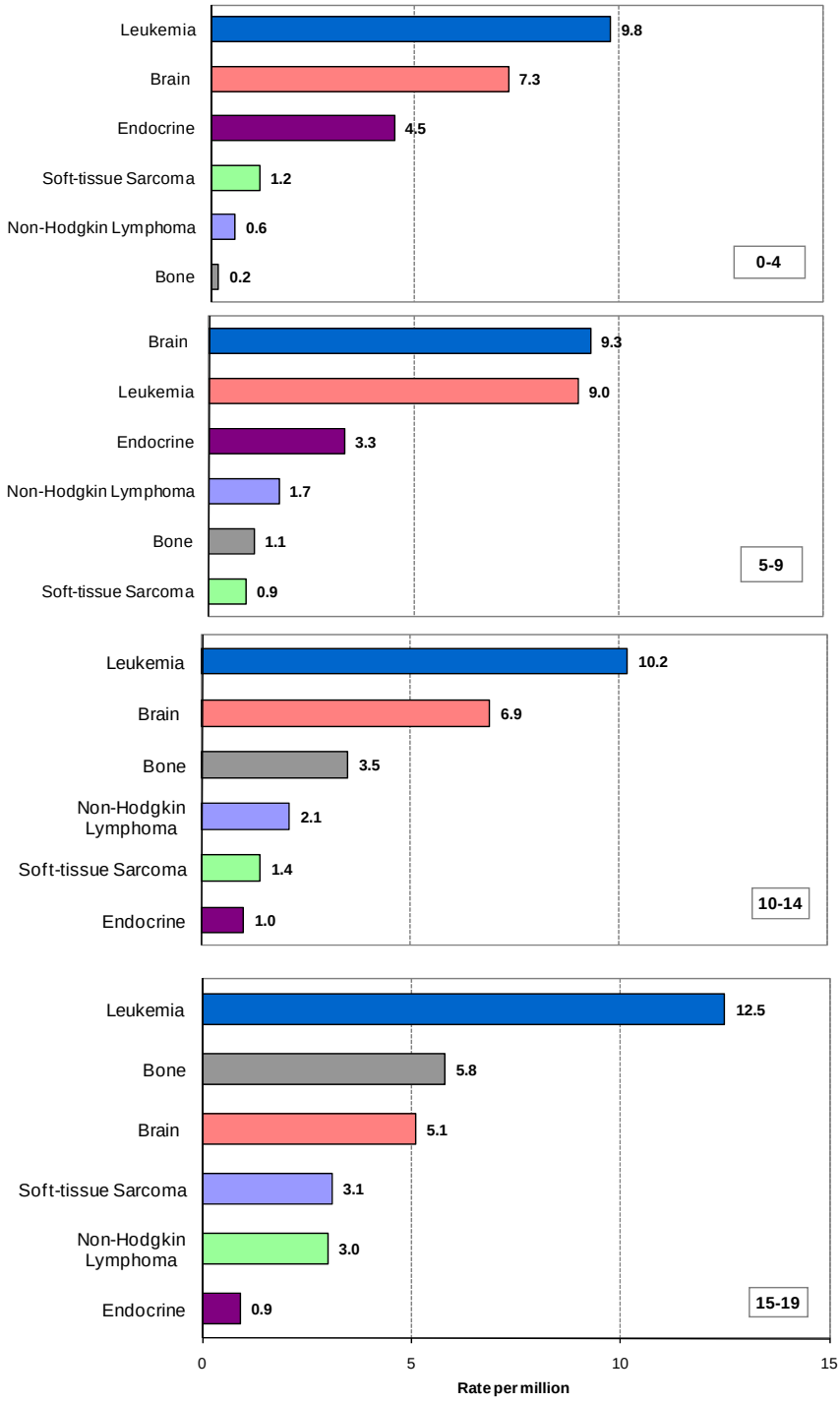
Leukemia

Over 33% of all cancer-related deaths among children are due to leukemia. There were a total of 1,010 deaths from leukemia from 1981-2007. Mortality rates declined at a statistically significant annual percent rate of -3.23 per year. Significant annual rate reductions were observed in all age groups with the exception of adolescents.

Brain and CNS

Brain tumors were the cause of 23% of pediatric cancer deaths. Overall, mortality trends were stable from 1981 to 2007 with a significant annual decrease (-1.63) among Whites only.

Figure 20. Age-Specific Mortality Rates of Leading Pediatric Cancers, Florida, 1981-2007



TRENDS

Average percent annual change in overall cancer mortality declined overall, with leukemia and lymphoma deaths contributing the most to this reduction. While rates for sift tissue sarcoma, bone cancer and neuroblastoma were stable over time, rates for brain cancer declined significantly at an annual percent rate of -1.03.

Figure 21. Pediatric Mortality Rates for All Cancers by Race, Florida, 1981-2007

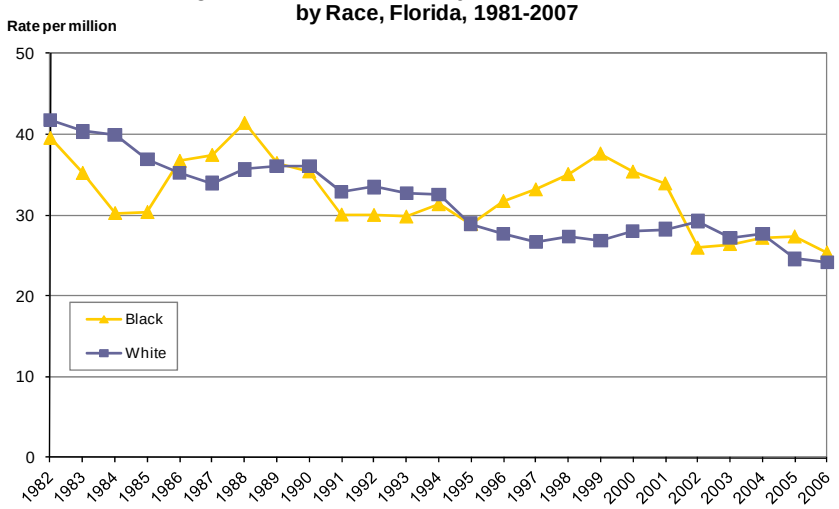
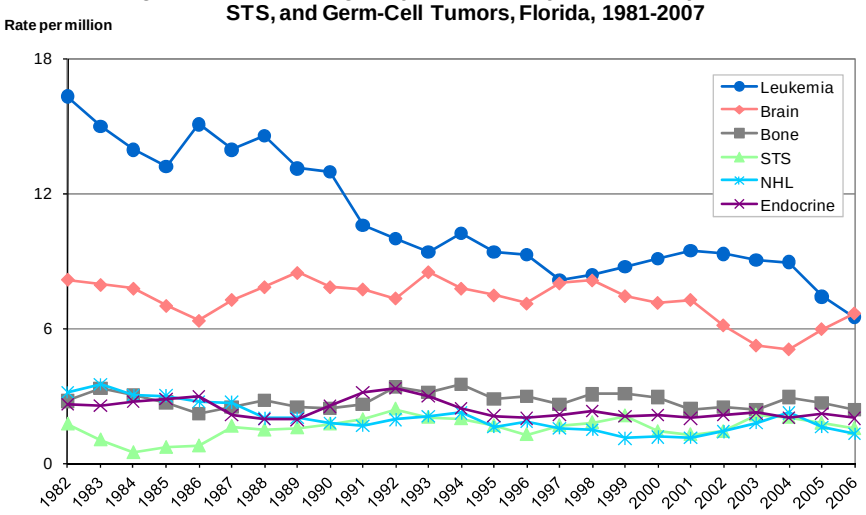


Figure 22. Trends in Age-Adjusted Mortality Rates of Hepatic, Bone, STS, and Germ-Cell Tumors, Florida, 1981-2007



ICCC I. LEUKEMIA

Between 1981 and 2007, an average of 150 new cases of leukemia occurred every day in Florida. As shown in Table I-1 acute lymphoid leukemia (ALL) was the leading type of leukemia accounting for 30.6% of all cancer cases, followed by acute myeloid leukemia (AML), accounting for 7.2% of cases.

Table I-1 Age-Adjusted Incidence Rates of Leukemia by ICCC Subgroup, Florida, 1981-2007

	Rate/Million	Count
Leukemia	41.3	4,037
Acute Lymphoid Leukemia	30.6	2,993
Acute Myeloid Leukemia	7.2	707
Myeloproliferative	1.4	135
Myelodysplastic	0.4	42
Other and Unspecified	1.6	160

AGE

The rates and distribution of leukemia subsites by age were lower among adolescents than children under age 15 (Figure I-1). Acute lymphoid leukemia was the predominant subsite in children age 0 to 4 with lower rates among older children and adolescents. Similar rates of AML exist across age with rate variations fluctuating from younger to older age groups. The occurrence of myeloproliferative and myelodysplastic diseases were rare, but with higher rates among adolescents.

SEX

Incidence rates for ALL are higher in males than in females across age categories (Figure I-3). For cases of AML, incidence rates were comparable between males and females across age groups, with the greatest difference occurring in the 0 to 4 age category with higher rates among males. However, adolescent females have higher rates of AML than males. Rates of myeloproliferative leukemia are higher among females than in males across age group, especially among adolescents.

Figure I-1. Age-Specific and Age-Adjusted Incidence Rates by ICCC Subcategory and Age, Florida, 1981-2007

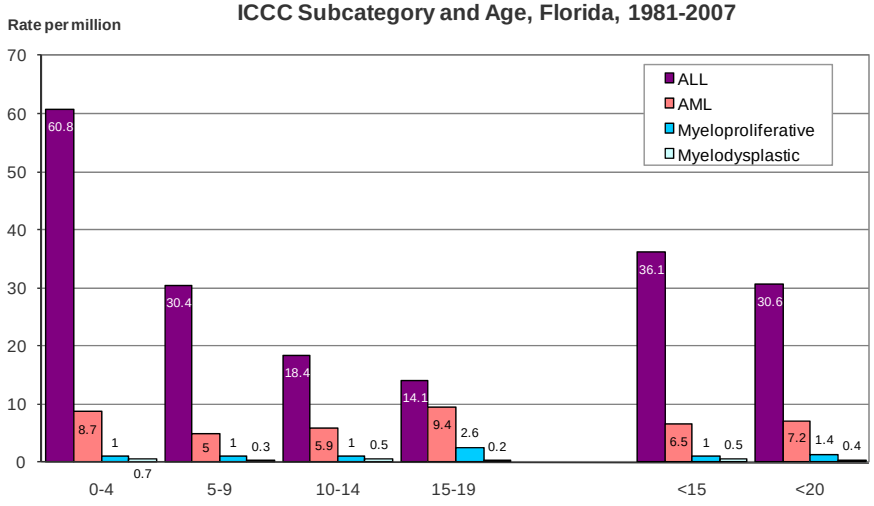
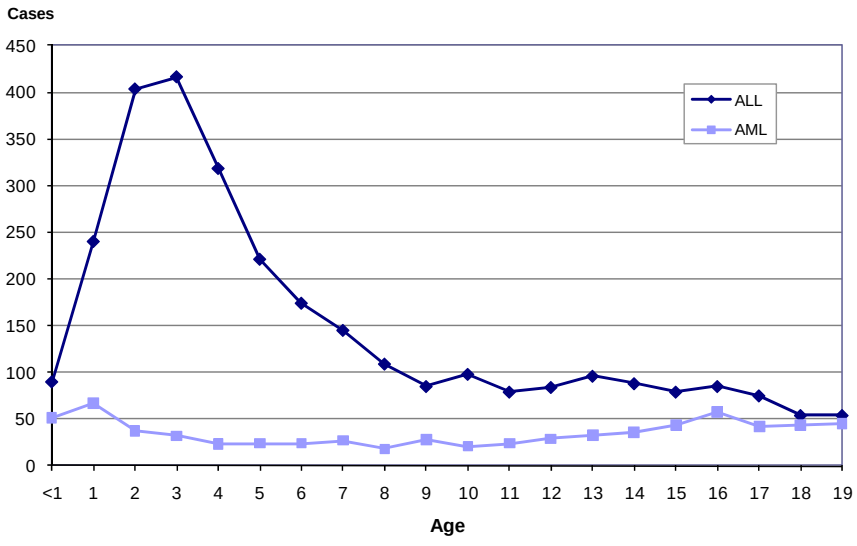


Figure I-2. ALL and AML by Age, Florida, 1981-2007



RACE

ALL is the leading cause of leukemia among both Whites and Blacks. However, rates in Whites (34 per million) are considerably higher than in Blacks (18 per million), particularly in the 0 to 4 age category (Figure I-5). The greatest rate differences occurred among those between the ages of 0 and 4 with a rate of 69 per million for Whites, and 32 per million for Blacks. Incidence rates for AML were more comparable between Blacks and White than for ALL, with the most apparent differences in the 0 to 4 age category (Figure I-6). Blacks had slightly higher rates than Whites in the 5 to 9 and 15 to 19 age categories.

SEER

Florida incidence rates in leukemia were marginally higher than rates in the SEER population. Higher rates also were observed by sex and race, with the greatest differences occurring between Florida Black males (31 per million) and SEER Black men (26 per million).

TRENDS

In Florida, trends for ALL incidence are variable throughout the study period, with slightly higher rates in 2007 (34.7 per million) than in 1981 (29.3 per million). Incidence rates in AML were relatively stable throughout the period, ending with a rate of 8 per million, up from 4.7 in 1981.

Figure I-3. Age-Specific and Age-Adjusted Incidence Rates by Sex, ALL, Florida, 1981-2007

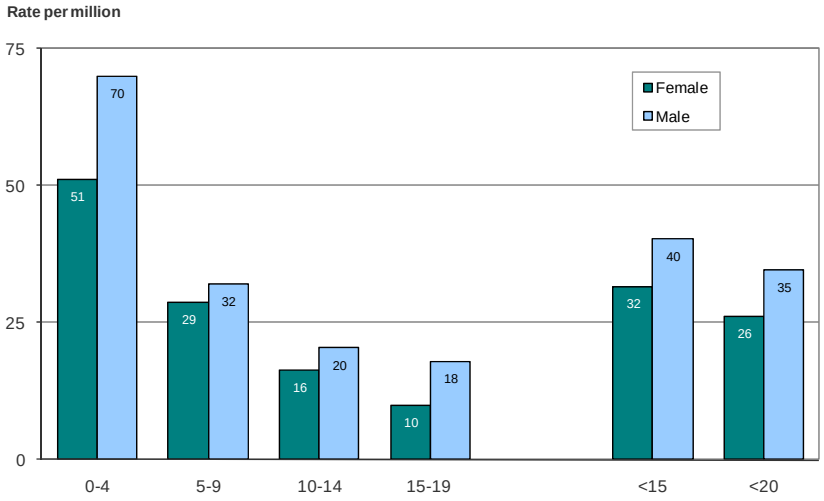


Figure I-4. Age-Specific and Age-Adjusted Rates of AML and Myeloproliferative by Sex, Florida, 1981-2007

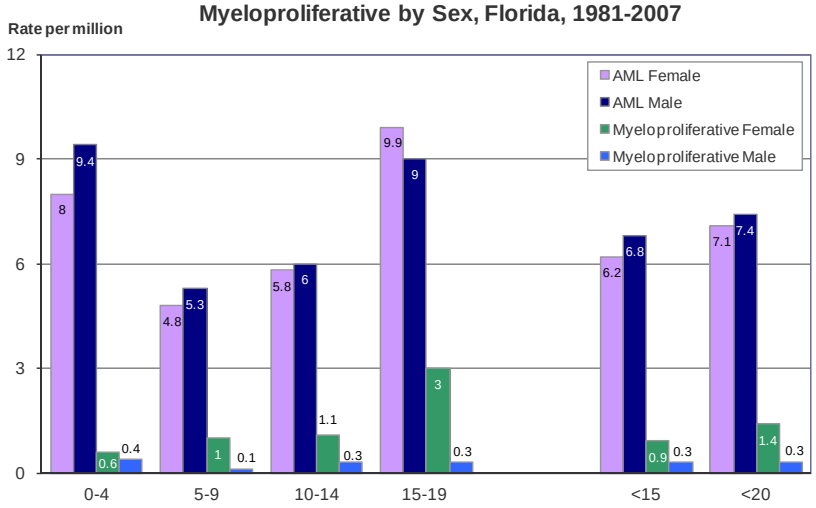


Figure I-5. Age-Specific and Age-Adjusted Incidence Rates of ALL by Race, Florida, 1981-2007

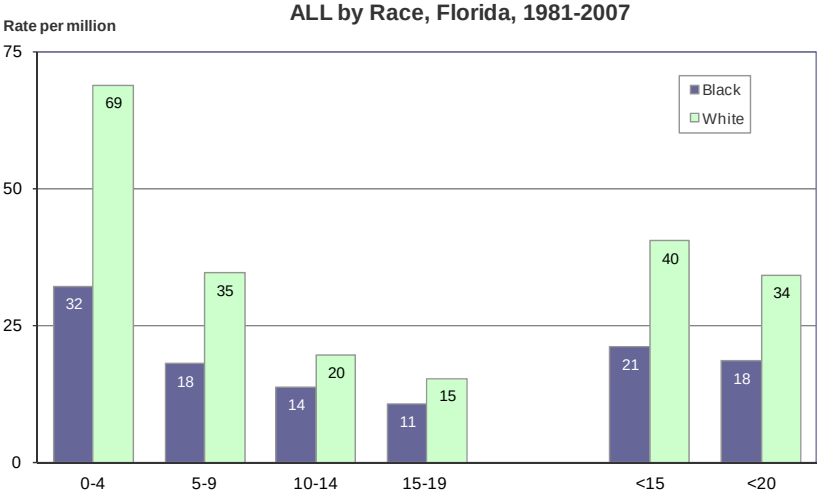


Figure I-6. Age-Adjusted Incidence Rates of AML by Race, Florida, 1981-2007

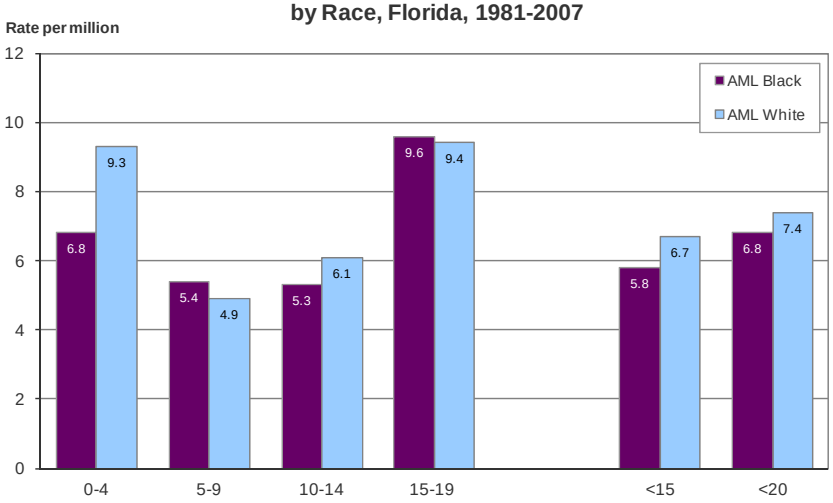


Figure I-7. Age-Adjusted Incidence Rates of Leukemia by Sex and Race, Florida and SEER, 1981-2006

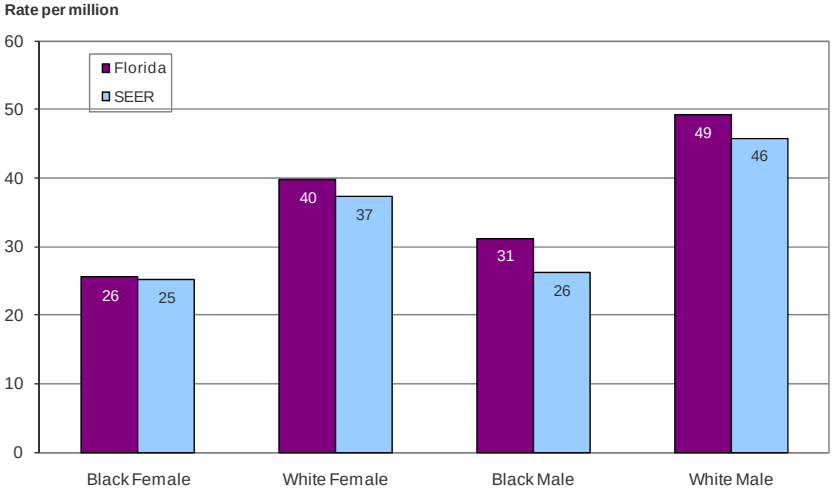
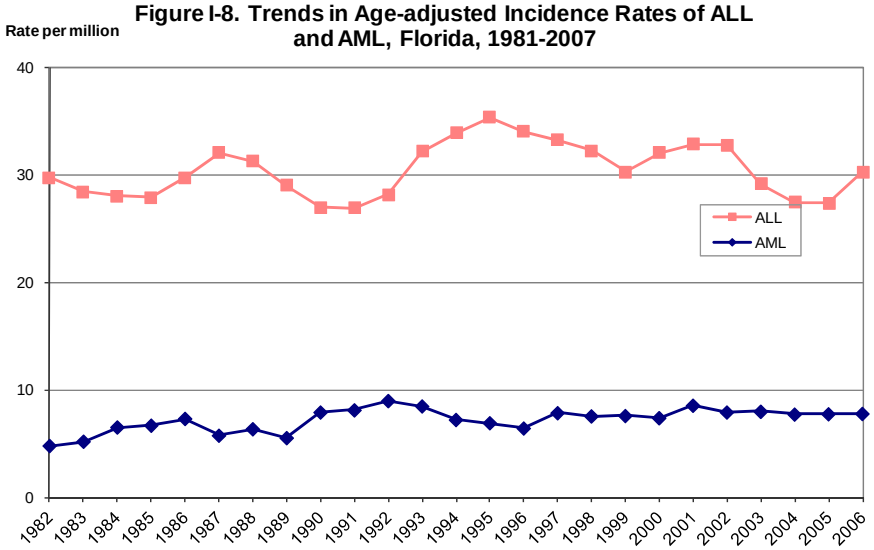


Figure I-8. Trends in Age-adjusted Incidence Rates of ALL and AML, Florida, 1981-2007



* Trend lines are 3-year moving averages.

ICCC II. LYMPHOMA AND RETICULOENDOTHELIAL NEOPLASMS

In Florida, between 1981 and 2007 there were a total of 2,368 cases of lymphoma; 1,118 were cases of Hodgkin lymphoma (HL), 1,118 were cases of non-Hodgkin lymphoma (NHL), 1,102 were cases of Burkitt lymphoma and 238 were diagnosed as miscellaneous (Table II-1). Incidence rates of pediatric lymphoma increase with age, particularly for HL. Non-Hodgkin lymphoma is more common among young children, while Hodgkin lymphoma is more common among adolescents.

Table II-1. Number, Percent, and Age-Adjusted Incidence Rates of Lymphoma by Sex and ICCC Subcategory, Florida, 1981-2007

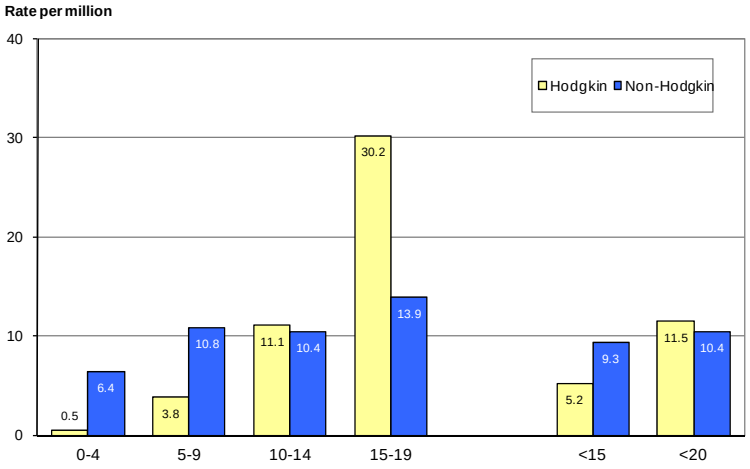
	Florida	Female	%	Male	%
All Lymphomas	2,368	962	40.6	1,406	59.4
II(a) Hodgkin	1,118	534	47.8	584	52.2
II(b,c) Non-Hodgkin & Burkitt	1,012	324	32.0	688	68.0
II(d,e) Miscellaneous & Unspecified	238	104	43.7	134	56.3

HODGKIN LYMPHOMA

AGE

The incidence of Hodgkin lymphoma is highest among adolescents (30.2 per million) and lowest in young children ages 0 to 4 (0.5 per million)(Figure II-1).

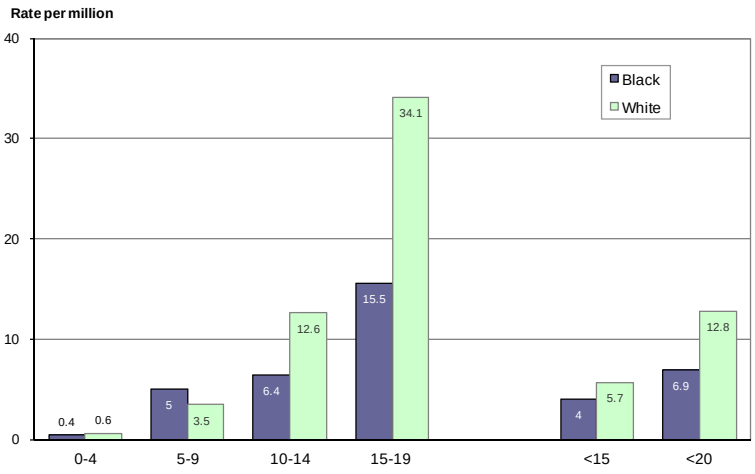
Figure II-1. Age-Specific and Age-Adjusted Incidence Rates of Lymphoma by ICCC Subcategory, Florida, 1981-2007



RACE

Figure 11-2 depicts HL incidence rates by age – group and race. The overall incidence rate for HL was higher among Whites (12.8 per million) than in Blacks (6.9 per million). Greater differences between Black (15.5 per million) and White (34.1 per million) adolescents were observed than any other age group.

Figure II-2. Age-Specific and Age-Adjusted Incidence Rates of Hodgkin Lymphoma by Race, Florida, 1981-2007



TREND

Incidence rate trends in HL were variable over time, fluctuating between a rate of 8 and 17 per million. Rates at the end of the study period (13.7 million) were similar to rates in 1981 (17.9 per million).

NON-HODGKIN LYMPHOMA, BURKITT LYMPHOMA AND OTHERS

AGE

The incidence rates of NHL were lowest among children and highest among adolescents (Figure II-6).

SEX

Incidence of Non Hodgkin lymphoma was greater in males (13.9 per million) than in females (6.8 per million) across all age groups with the greatest difference in the 10 to 14 age category.

RACE

Incidence rates of NHL were higher among Whites than in Blacks across age groups with the exception of adolescents, where the rates for Blacks are 14.6 per million, and rates for Whites were 13.8 per million (Figure II-7).

SEER

Florida incidence rates for NHL were slightly higher than for the SEER population when stratifying by sex and race (Figure II-8).

TREND

The Incidence rate in NHL and Burkitt was variable over time with an increasing trend (Figure II-9). During the latter part of the period a decline in rates occurred from 12.2 per million in 2003 to a rate of 8.6 per million in 2007.

Figure II-3. Age-Adjusted Incidence Rates of Hodgkin Lymphoma by Sex and Race, Florida and SEER, 1981-2006

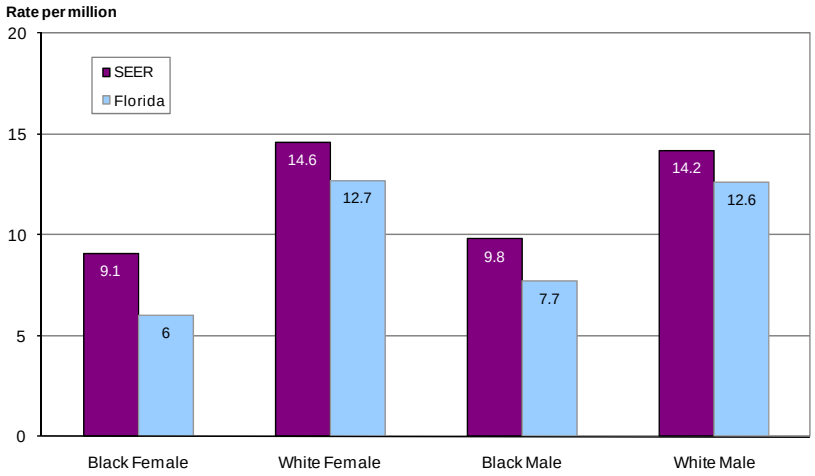
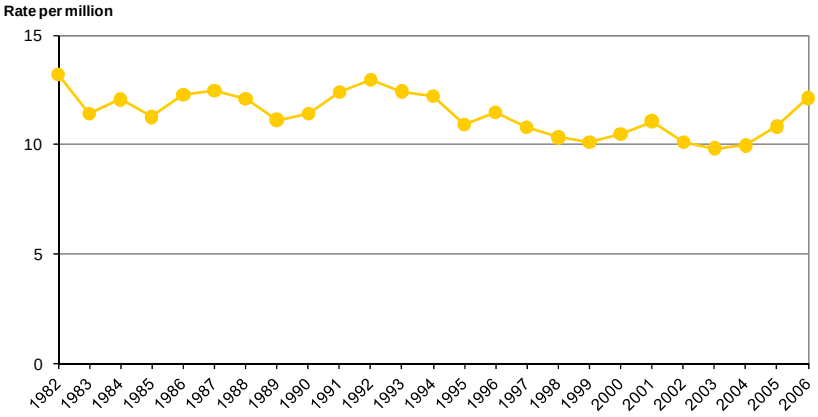


Figure II-4. Trend in Age-Adjusted Incidence Rate of Hodgkin Lymphoma, Florida, 1981-2007



* Trends are 3-year moving averages.

ICCC III. CENTRAL NERVOUS SYSTEM AND MISCLLANEOUS INTRACRANIAL AND INRASPINAL NEOPLASMS

Malignant neoplasms of the central nervous system (CNS) accounted for 18% of pediatric cancers in Florida during the 1981 to 2007 study period. After leukemia they are the second leading cause of pediatric cancer with a rate of 30 per million among males and 27 per million among females. Brain tumors are also the second leading cause of cancer-related deaths for children and adolescents, accounting for 23% of all cancer deaths. Within the category of CNS neoplasms there are many types of cancers of different histology and prognosis. Table III-1 lists the types of cancers that fall within malignant CNS neoplasms and that are discussed in this chapter.

Table.III-1 Numbers and Percents of CNS Neoplasms by Age and ICCC Subcategory, Florida 1981-2007

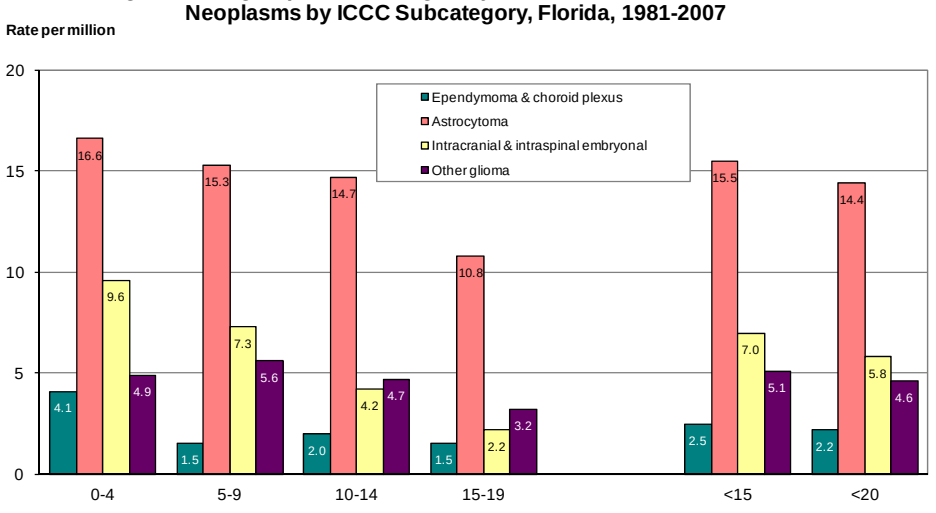
	0-4	%	5-9	%	10-14	%	15-19	%	<15	%	<20	%
III CNS	899	100.0	767	100.0	648	100.0	478	100.0	2,314	100	2,792	100.0
III(a) Ependymoma & choroid plexus	99	11.0	36	4.7	48	7.4	36	7.5	183	8	219	7.8
III(b) Astrocytoma	401	44.6	370	48.2	357	55.1	267	55.9	1128	49	1395	50.0
III(c) Intracranial & intraspinal embryonal	231	25.7	175	22.8	101	15.6	55	11.5	507	22	562	20.1
III(d) Other glioma	118	13.1	135	17.6	113	17.4	79	16.5	366	16	445	15.9
III(e,f) Other & Unspecified	50	5.6	51	6.6	29	4.5	41	8.6	130	6	171	6.1

From the year 1981 to 2007 there were a total of 2,792 malignancies of CNS diagnosed and reported in Florida. The proportional distribution of CNS subsites were lead by Aastrocytomas accounting for 50% of cases, followed by intracranial & intraspinal embryonal (20%), other gliomas (16%), ependymoma & choroid plexus (7.8%), and other & unspecified (6.1%).

AGE

Malignant neoplasms of the CNS were generally more common among younger age groups than in older children. This was the case for CNS neoplasms by ICCC subcategory, with the exception of ependymoma & choroid plexus tumors where rates were more stable across age groups (Figure III-1). Astrocytomas were the most common type regardless of age with a rate of 16.6 per million in the 0 to 4 age category and 10.8 per million among adolescents. Ependymoma & choroid plexus were the rarest form of CNS for all age groups, particularly among children older than 4 years of age.

Figure III-1. Age-Specific and Age-Adjusted Incidence Rates for CNS Neoplasms by ICCC Subcategory, Florida, 1981-2007



SEX

Figure III-2 displays the incidence rates of CNS by age group and sex. The incidence of CNS tumors was higher among males than in females across age groups, with the exception of the 10 to 14 age category where rates were comparable (27 per million). The greatest differences in rates occurred in adolescents (17 per million for females and 21 per million for males).

RACE

The incidence rate of CNS neoplasms was greater in Whites than in Blacks across age category (Figure III-3), with higher rates among both groups occurring at younger ages. Overall the incidence rate in Whites was 30 per million and 23 per million in Blacks.

SEER

When comparing Florida pediatric rates of CNS to that of SEER rates, Florida has lower incidence rates for White males and females, and for Black males, but higher rates for Black females by a small margin (Figure III-4).

TRENDS

Trends in astrocytomas and intracranial & intraspinal embryonal neoplasms are shown in Figure III-5. Astrocytoma incidence rates were variable over time with a decline between 1985 and 1988 followed by a sharp increase in 1990. Thereafter rates were more stable and eventually declining more dramatically in 2006. Incidence rates for intracranial & intraspinal embryonal neoplasms were generally more stable over time.

Figure III-2. Age-Specific and Age-Adjusted Incidence Rates of CNS Neoplasms by Sex, Florida, 1981-2007

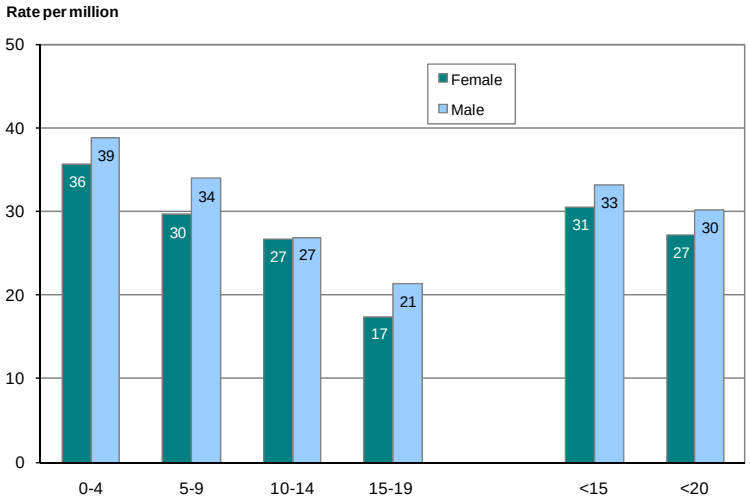


Figure III-3. Age-Specific and Age-Adjusted Incidence Rates of CNS Neoplasms by Race, Florida, 1981-2007

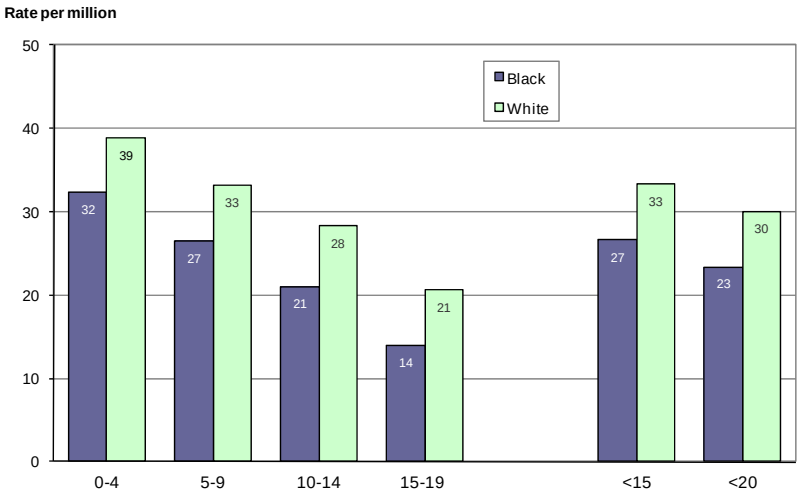


Figure III-4. Age-Adjusted Incidence Rates of CNS Neoplasms by Sex and Race, Florida and SEER, 1981-2006

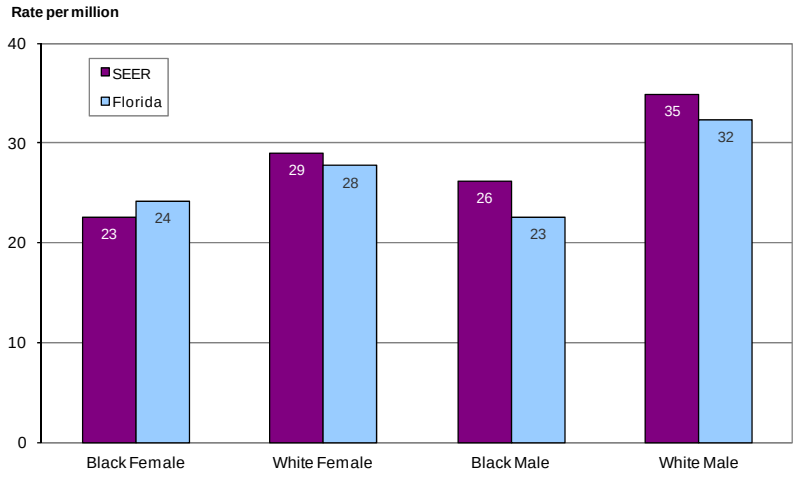
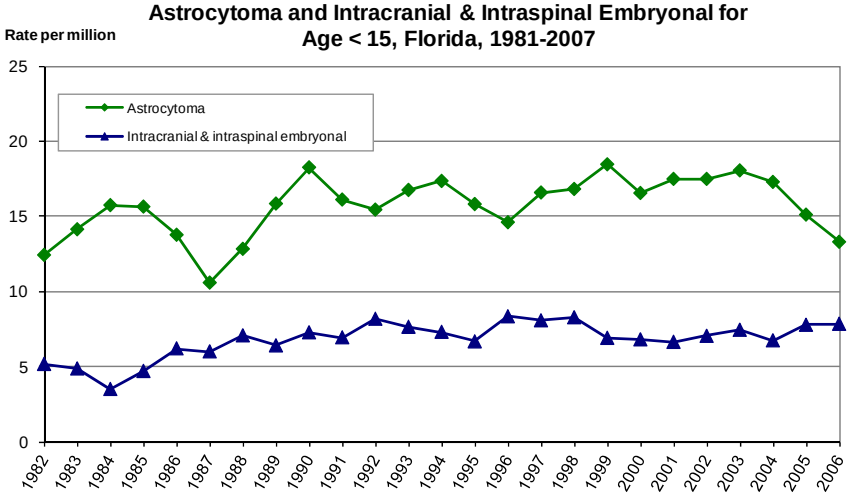


Figure III-5. Trends in Age-Adjusted Incidence Rate of Astrocytoma and Intracranial & Intraspinal Embryonal for Age < 15, Florida, 1981-2007



ICCC IV. NEUROBLASTOMA AND PERIPHERAL NERVOUS CELL TUMORS

Neuroblastoma and peripheral nervous cell tumors accounted for 5.2% of all pediatric cancers. A total of 815 cases were diagnosed between 1981 and 2007 among children and adolescents, a majority (97%) consisted of neuroblastoma and ganglioneuroblastomas.

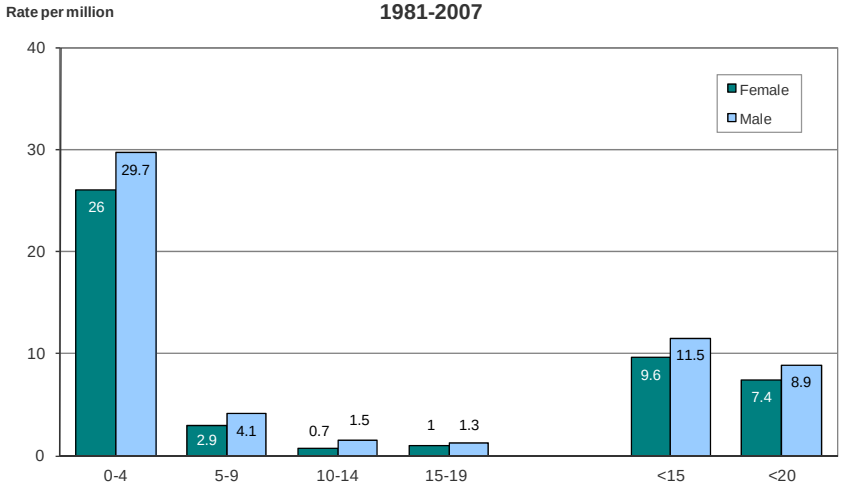
Table IV-1. Number of Cases and Age-Adjusted Incidence Rates of Neuroblastoma and Peripheral Nervous Cell by Age and ICCC Subcategory, Florida, 1981-2007

	00-04	%	05-09	%	10-14	%	15-19	%	<15	%	<20	%
IV Neuroblastoma and peripheral nervous cell	674	100.0	85	100.0	27	100.0	29	100.0	786	100	815	100.0
IV(a) Neuroblastoma and ganglioneuroblastoma	668	99.1	82	96.5	22	81.5	18	62.1	772	98	790	96.9
IV(b) Other peripheral nervous cell	6	0.9	3	3.5	5	18.5	11	37.9	14	2	25	3.1

AGE

As depicted in Figure IV-1, neuroblastoma and peripheral nervous cell tumors are most common in early childhood with rates as high as 29.7 per million for males and 26 per million for females. Incidence in older groups remain relatively rare with rates as low as 0.7 in females between the ages of 10 and 14.

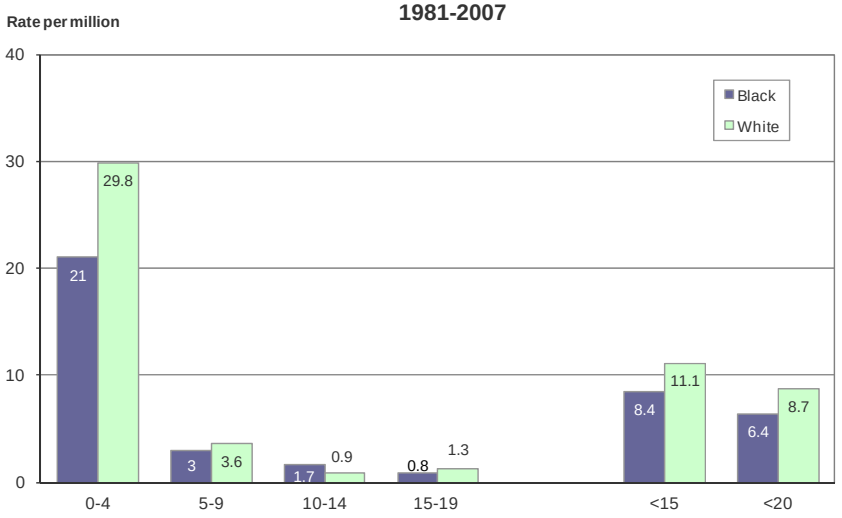
Figure IV-1. Age-Specific and Age-Adjusted Incidence Rates of Neuroblastoma and Peripheral Nervous Cell by Sex, Florida, 1981-2007



SEX AND RACE

Males have higher incidence rates of neuroblastoma and peripheral nervous cell than females across age groups. Higher rates are observed for Whites in all age categories with the exception of the 10 to 14 group where Black children have slightly higher rates. The greatest difference in rates between Black and White children are observed in the 0 to 4 age category with a rate of 29.7 per million among Whites and 21 per million among Blacks.

Figure IV-2. Age-Specific and Age-Adjusted Incidence Rates of Neuroblastoma and Peripheral Nervous Cell by Race, Florida, 1981-2007



SEER

Compared to SEER rates between the years 1981 and 2006, Florida rates for Black females, White females, and Black males are slightly lower than SEER rates, while rates for White males are slightly higher. The greatest rate difference is between Florida White females and SEER white females with rates of 10.1 and 11.6 per million, respectively.

TRENDS

The rate trends for neuroblastoma and peripheral nervous cell carcinoma among children younger than 15 are reported in Figure IV-4. Average rates increased variably since 1982, declining between 1989 and 1994, after which rates reached a peak in 2000. The lowest rate was observed in 1982 at a rate of 6.26 per million and peaked in the year 2000 at a rate of 13 per million.

Figure IV-3. Age-Adjusted Incidence Rates of Neuroblastoma and Peripheral Nervous Cell by Sex and Race, Age < 15, Florida and SEER, 1981-2006

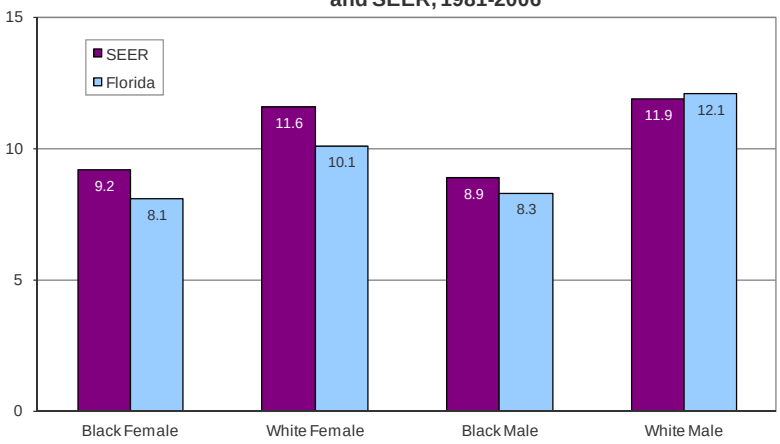
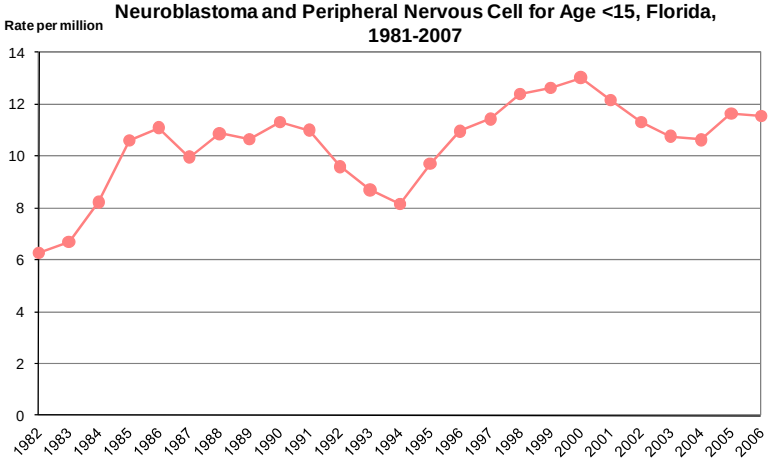


Figure IV-4. Trend of Age-Adjusted Incidence Rate of Neuroblastoma and Peripheral Nervous Cell for Age <15, Florida, 1981-2007



* Trend is a 3-year moving average.

ICCC V. RETINOBLASTOMA

Retinoblastoma is a rare cancer that originates in the part of the eye called the retina. Among children, retinoblastoma is more common among infants and extremely among adolescents.

AGE

During the study period, a total of 164 cases of retinoblastoma were diagnosed among infants younger than 1 year old. Cases were reduced by half with each additional year of age up to the age of 5. Between the ages of 6 to 9 only one or two cases were observed and no cases were observed among those ages 10 or older.

SEX

Age adjusted rates by age group and sex are reported in Figure V-2. Within the study period males had slightly higher rates than rates in females with the biggest difference occurring in the 0 to 4 age group.

SEER

Incidence rate comparisons of retinoblastoma to the SEER population are shown in Figure V-3. With the exception of Black females, rates were higher in the Florida population. Both White male and females in Florida had higher rates than those in the SEER group with Black males having the greatest difference in rates at 5.6 per million compared to 4 per million.

Figure V-1. Total Childhood Retinoblastoma by Age < 15, Florida, 1981-2007

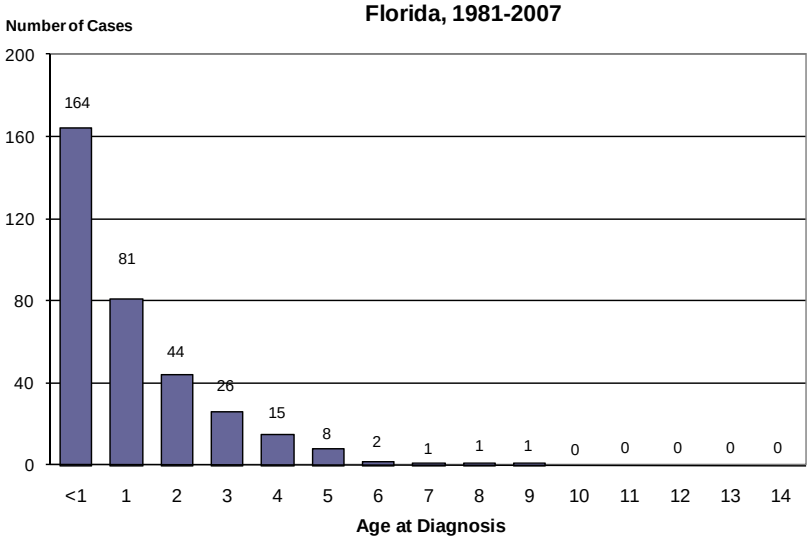


Figure V-2. Age-Specific and Age-Adjusted Incidence Rates of Retinoblastoma by Sex, Age < 15, Florida, 1981-2007

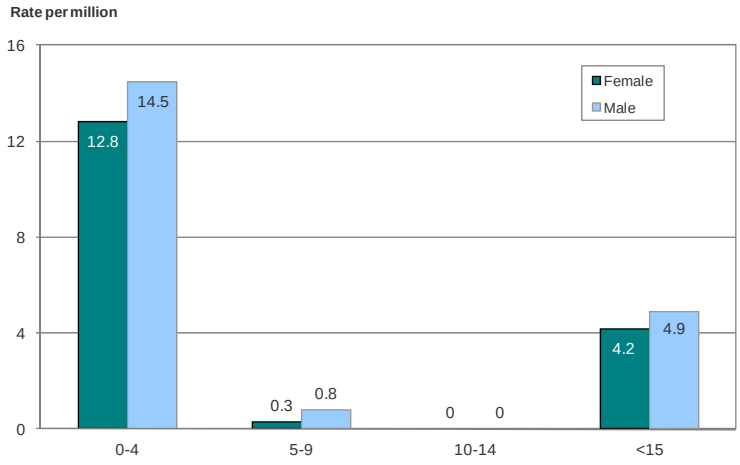
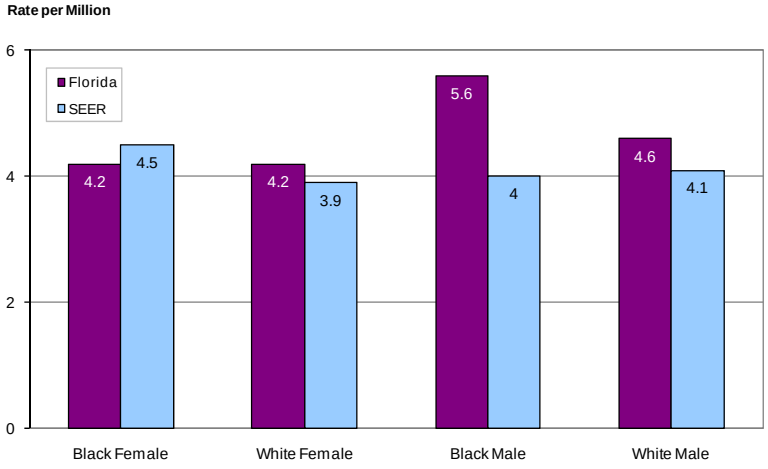


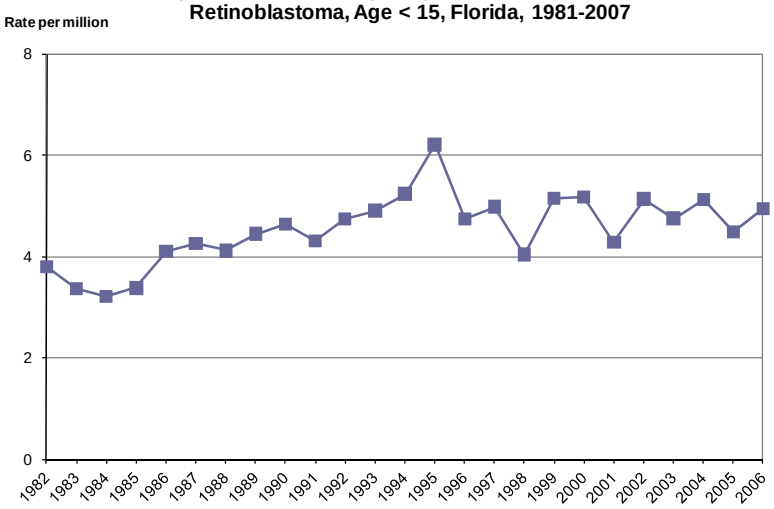
Figure V-3. Age-Adjusted Incidence Rates of Retinoblastoma by Sex and Race, Age < 15, Florida and SEER, 1981-2006



TRENDS

Average age-adjusted incidence trends are reported in Figure V-4. Among children younger than age 15 rates increased slightly and peaked in 1995 at a rate of 5.4 per million. Between the years 1996 and 2006 rates were variable and settled at a rate of 4.9 per million in 2006.

Figure V-4. Trend in Age-Adjusted Incidence Rate of Retinoblastoma, Age < 15, Florida, 1981-2007



ICCC VI. RENAL TUMORS

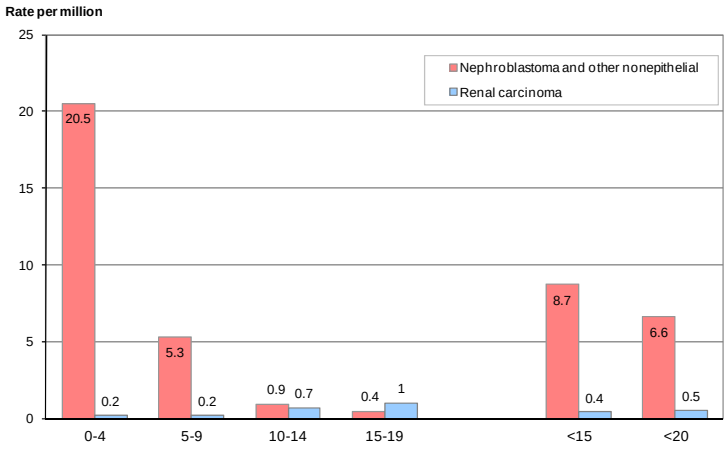
Renal tumors are rare among children and adolescents, but occur more frequently in early childhood than in later childhood or adolescence. Between the years 1981 and 2007 a total of 706 pediatric renal tumors were reported in Florida, accounting for 4.5% of all pediatric cancers. Renal tumors are the fourth ranking cancer among children ages 0 to 4. Incidence rates and counts of renal tumors are reported in Table VI-1 by age group and histology. Nephroblastoma accounts for the overwhelming majority of renal tumors in children and adolescents (89%).

Table VI-1. Age-Specific and Age-Adjusted Incidence Rates of Renal Tumors by Histology, Florida, 1981-2007

	0-4		5-9		10-14		15-19		<15		<20	
	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count
All Histologies	20.8	502	5.5	132	1.6	39	1.3	33	9.1	673	7.1	706
8960 Nephroblastoma	19.6	474	5.3	127	0.7	17	0.3	7	8.3	618	6.3	625
8963 Rhabdoid	0.3	7	0	0	0	0	0	0	0.1	7	0.1	7
8964 Clear cell	0.5	11	0	1	0.1	2	0.1	2	0.2	14	0.2	16
8000-8005 Unspecified	0.1	3	0	0	0	0	0	0	0	3	0	3
Other Renal Carcinoma	0.3	7	0.2	4	0.8	20	1	24	0.4	31	0.6	55

Rates are per 1,000,000 and age-adjusted to the 2000 U.S. standard.

Figure VI-1. Age-Specific and Age-Adjusted Incidence Rates of Renal Tumors by ICCC Subcategory, Florida, 1981-2007



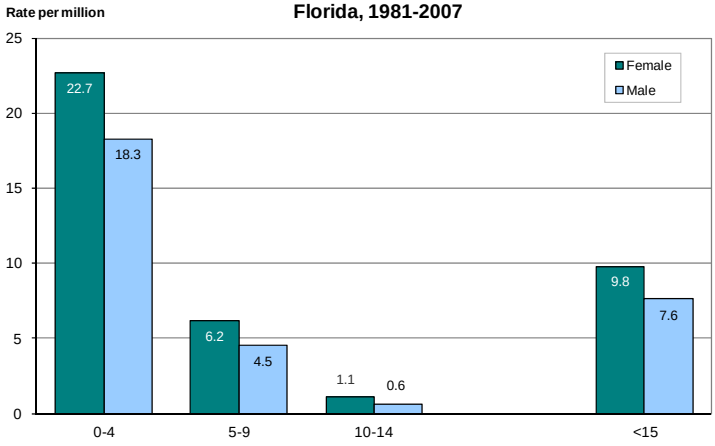
AGE

Incidence rates by age group are reported in Figure VI-1. As discussed, a majority of renal tumors are diagnosed in early childhood and primarily consist of nephroblastoma and other nonepithelial tumors. Among children between the ages 0 and 4, a rate of 20.5 per million was observed, compared to 5.3 per million in the age 5 to 9 category.

SEX

Renal tumors were more common among females than males in age groups below 15 years of age (9.8 versus 7.6 per million). Female rates in the 0 to 4 age category was 22.7 per million compared to 18.3 per million among males in the same age group.

Figure VI-2. Age-Specific and Age-Adjusted Incidence Rates of Nephroblastoma & Other Nonepithelial for Age < 15 by Sex, Florida, 1981-2007



SEER

Among children younger than 15 years of age, the incidence rates of renal tumors in the SEER population were lower than rates in the Florida population for both Black male and females, and for White females. White males in Florida had slightly higher rates than the SEER population (8.5 versus 7.4 per million).

TRENDS

The average age-adjusted trends for renal tumors among children younger than age 15 are presented in Figure VI-4. While rates appear variable, there were small rate fluctuations over time.

Figure VI-3. Age-Adjusted Rates of Nephroblastoma & Other Nonepithelial for Age < 15 by Sex and Race, Florida and SEER, 1981-2006

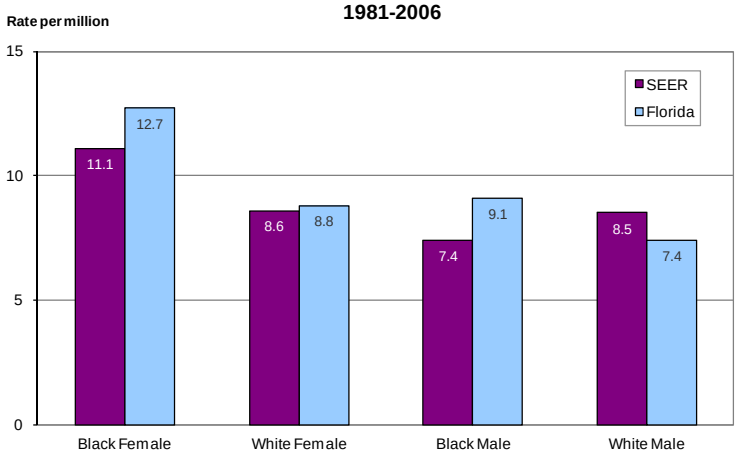
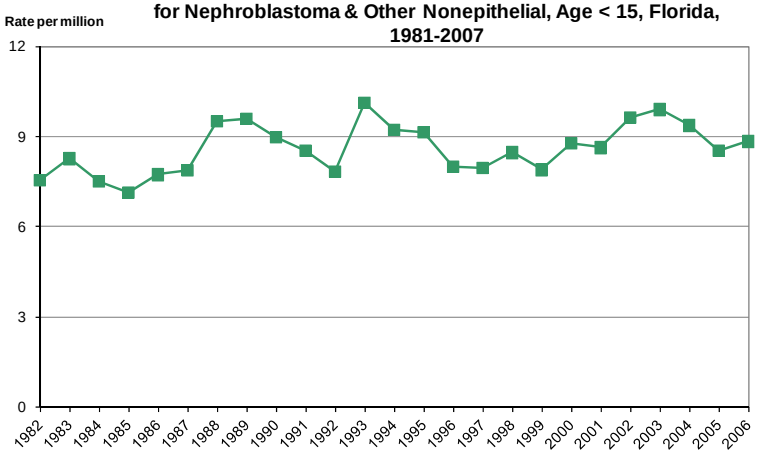


Figure VI-4. Trend in Age-Adjusted Incidence Rate for Nephroblastoma & Other Nonepithelial, Age < 15, Florida, 1981-2007



* Trend is a 3-year moving average.

ICCC VII. HEPATIC TUMORS

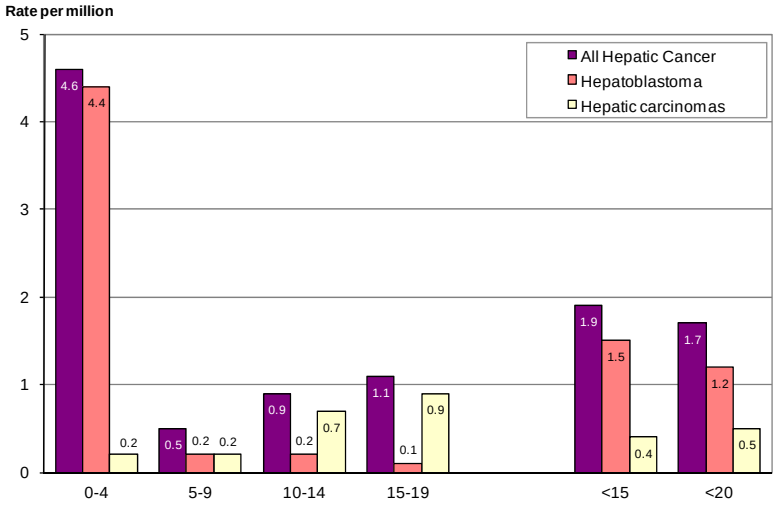
In Florida there were a total of 170 cases of liver tumor in children younger than 20 between the years 1981 and 2007. The age adjusted incidence rate for this period was 1.7 per million A majority of these cases (65%) occurred in the 0 to 4 age category. Incidence rates, counts, and proportions are reported in Table VII-1 by age group. A rare cancer, hepatic tumors only account for 1.1% of pediatric tumors in Florida. Of all the pediatric hepatic tumors, 69% consisted of hepatoblastoma and 30% were cases of hepatic carcinoma.

Table VII-1 Age-Specific and Age-Adjusted Incidence Rates and Percent of Hepatic Tumors by ICCC Subcategory, Florida, 1981-2007

		Rate	Count	Percent
0-4	All Hepatic Cancer	4.6	111	65.3
	VII(a) Hepatoblastoma	4.4	105	61.8
	VII(b) Hepatic carcinoma	0.2	5	2.9
5-9	All Hepatic Cancer	0.5	11	6.5
	VII(a) Hepatoblastoma	0.2	5	2.9
	VII(b) Hepatic carcinoma	0.2	6	3.5
10-14	All Hepatic Cancer	0.9	22	12.9
	VII(a) Hepatoblastoma	0.2	5	2.9
	VII(b) Hepatic carcinoma	0.7	16	9.4
15-19	All Hepatic Cancer	1.1	26	15.3
	VII(a) Hepatoblastoma	0.1	2	1.2
	VII(b) Hepatic carcinoma	0.9	23	13.5
<15	All Hepatic Cancer	1.9	144	84.7
	VII(a) Hepatoblastoma	1.5	115	67.6
	VII(b) Hepatic carcinoma	0.4	27	15.9
<20	All Hepatic Cancer	1.7	170	100.0
	VII(a) Hepatoblastoma	1.2	117	68.8
	VII(b) Hepatic carcinoma	0.5	50	29.4

Rates are per 1,000,000 and age-adjusted to the 2000 US Std Population

Figure VII-1. Age-Specific and Age-Adjusted Incidence Rates of Hepatic Tumors by ICCC Subcategory, Florida, 1981-2007



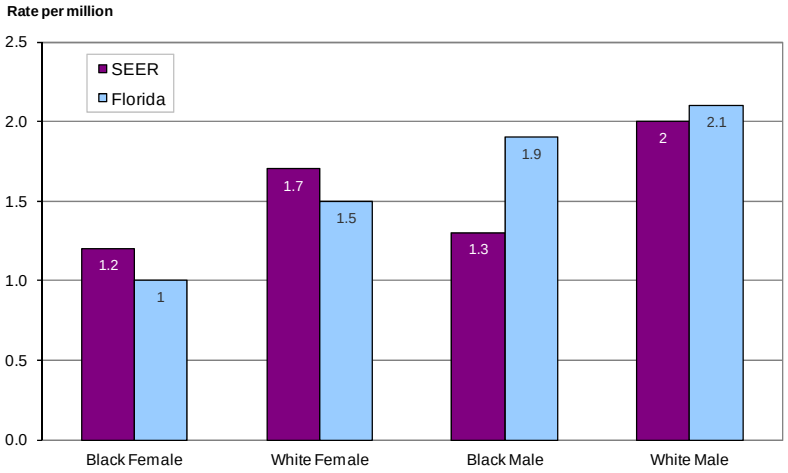
AGE

Hepatic tumors were most common among children ages 0 to 4, with a rate of 4.6 per million. While hapatoblastoma was the leading cause of liver tumor in the 0 to 4 age category, hepatic carcinomas was more common in the 10 to 14 and 15 to 19 age categories.

SEER

Incidence rates for the years 1981 to 2006 were higher among both Black and White females in the SEER population compared to the Florida population, whereas rates were higher among both Black and White males in the Florida population.

Figure VII-2. Age-Adjusted Incidence Rates of Hepatic Tumors by Sex and Race, Florida and SEER, 1981-2006



ICCC VIII. BONE TUMORS

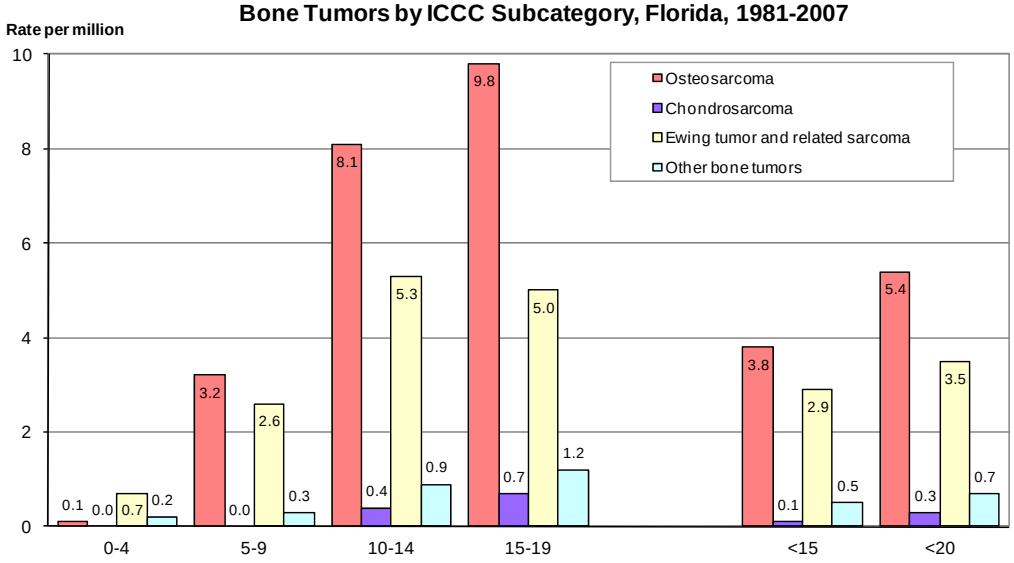
Malignant bone tumors accounted for 6% of all childhood and adolescent cancers in Florida during the study period. A total of 941 cases where reported during the study time, with an average of 36 cases per year. Table VIII-1 reports age-specific incidence rates for all bone tumor subcategories. These categories include osteosarcoma, chondrosarcoma, Ewing tumor and related sarcoma, and other bone tumors. A majority of bone tumors were diagnosed as osteosarcoma, accounting for 55% of the total among all pediatric cases. Ewing tumor and related sarcoma also accounted for a large proportion of bone tumor cases (35%). Figure VIII-1 displays the age-adjusted rate by age group and bone tumor subtype. Adjusting for age, the incidence rate for osteosarcoma was highest among adolescents at 9.8 per million and were much lower among younger children. Incidence rates for Ewing sarcoma were also higher among older age categories, with the highest rate occurring in the 10 to 14 age group at a rate of 5.3 per million. Other malignant bone types were relatively rarer.

Table VIII-1. Age-Specific and Age-Adjusted Incidence Rates and Percent of Bone Tumors by ICCC Subcategory, Florida, 1981-2007

Age		Rate	Count	Percent
0-4	VIII All Malignant bone tumors	1.1	26	2.8
	VIII(a) Osteosarcoma	0.1	3	0.3
	VIII(b) Chondrosarcoma	0	0	0.0
	VIII(c) Ewing tumor and related sarcoma	0.7	18	1.9
	VIII(d,e) Other bone tumors	0.2	5	0.5
5-9	VIII All Malignant bone tumors	6.1	148	15.7
	VIII(a) Osteosarcoma	3.2	76	8.1
	VIII(b) Chondrosarcoma	0	1	0.1
	VIII(c) Ewing tumor and related sarcoma	2.6	63	6.7
	VIII(d,e) Other bone tumors	0.3	8	0.9
10-14	VIII All Malignant bone tumors	14.6	353	37.5
	VIII(a) Osteosarcoma	8.1	195	20.7
	VIII(b) Chondrosarcoma	0.4	9	1.0
	VIII(c) Ewing tumor and related sarcoma	5.3	128	13.6
	VIII(d,e) Other bone tumors	0.9	21	2.2
15-19	VIII All Malignant bone tumors	16.8	414	44.0
	VIII(a) Osteosarcoma	9.8	243	25.8
	VIII(b) Chondrosarcoma	0.7	17	1.8
	VIII(c) Ewing tumor and related sarcoma	5	124	13.2
	VIII(d,e) Other bone tumors	1.2	30	3.2
<15	VIII All Malignant bone tumors	7.4	527	56.0
	VIII(a) Osteosarcoma	3.8	274	29.1
	VIII(b) Chondrosarcoma	0.1	10	1.1
	VIII(c) Ewing tumor and related sarcoma	2.9	209	22.2
	VIII(d,e) Other bone tumors	0.5	34	3.6
<20	VIII All Malignant bone tumors	9.7	941	100.0
	VIII(a) Osteosarcoma	5.4	517	54.9
	VIII(b) Chondrosarcoma	0.3	27	2.9
	VIII(c) Ewing tumor and related sarcoma	3.5	333	35.4
	VIII(d,e) Other bone tumors	0.7	64	6.8

Rates are per 1,000,000 and age-adjusted to the 2000 US Std Population

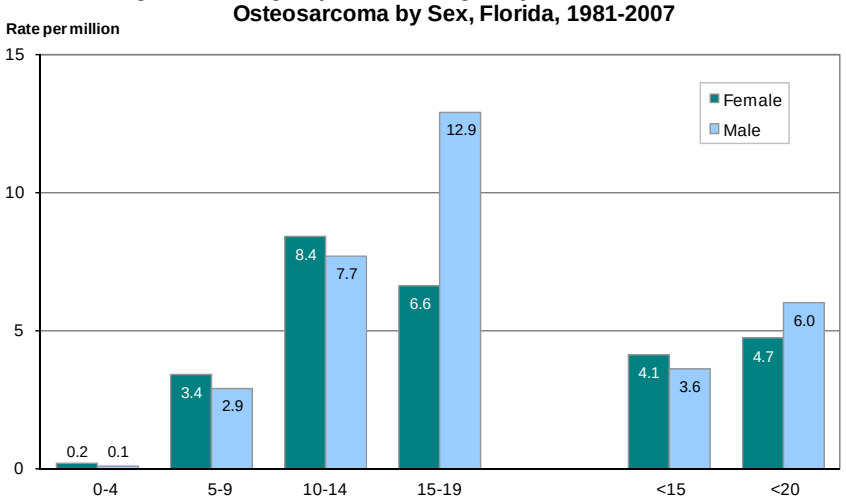
Figure VIII-1. Age-Specific and Age-Adjusted Incidence Rates of Malignant Bone Tumors by ICCC Subcategory, Florida, 1981-2007



SEX

Figures VIII-2 and VIII-3 report on the age adjusted incidence rate by age group and sex for osteosarcoma and Ewing sarcoma. For all ages combined males had higher rates than females (6.0 versus 4.7 per million). However, females had higher rates of osteosarcoma among children younger than age 15. Rates for Ewing and related sarcomas displayed higher rates among males at every age category with the greatest difference among adolescent males and females (6.5 versus 3.5 per million).

Figure VIII-2. Age-Specific and Age-Adjusted Incidence Rates of Osteosarcoma by Sex, Florida, 1981-2007



RACE

Figure VIII-4 reports incidence rates by age and race for osteosarcoma. For all ages combined Blacks had higher rates than did Whites (6.0 versus 5.2 per million), as well as for almost every age category. The greatest difference in rates occurred in the 5 to 9 age category with a rate of 5.0 per million among Black children and 2.5 per million among White children. These trends were reversed for incidence of Ewing and related sarcoma with Whites having the higher rates across age category.

Figure VIII-3. Age-Specific and Age-Adjusted Incidence Rates of Ewing & RelatedSarcoma by Sex, Florida, 1981-2007

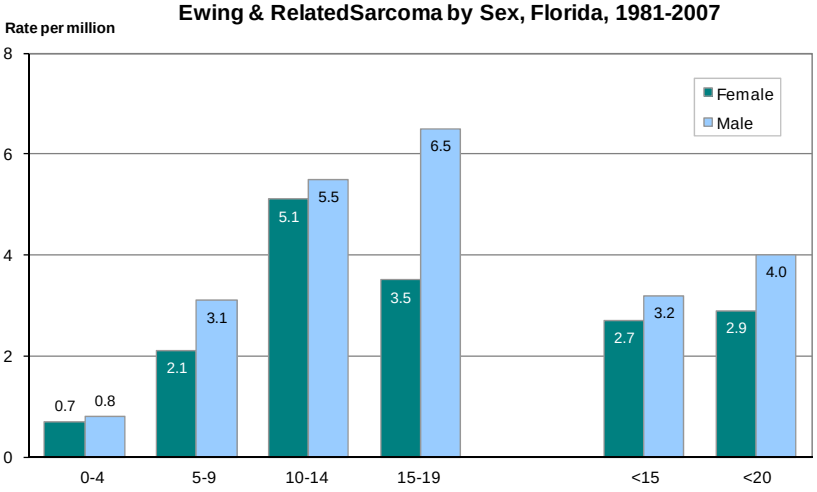


Figure VIII-4. Age-Specific and Age-Adjusted Incidence Rates of Osteosarcoma by Race, Florida, 1981-2007

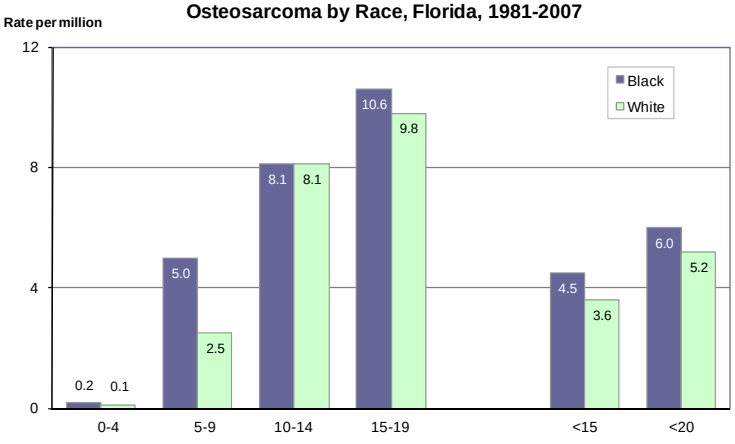
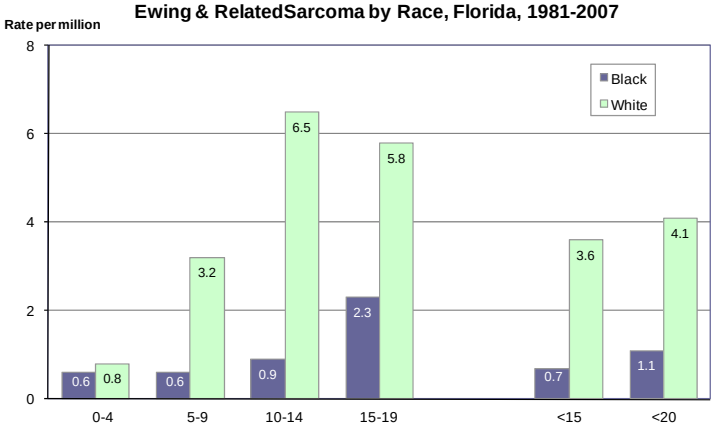


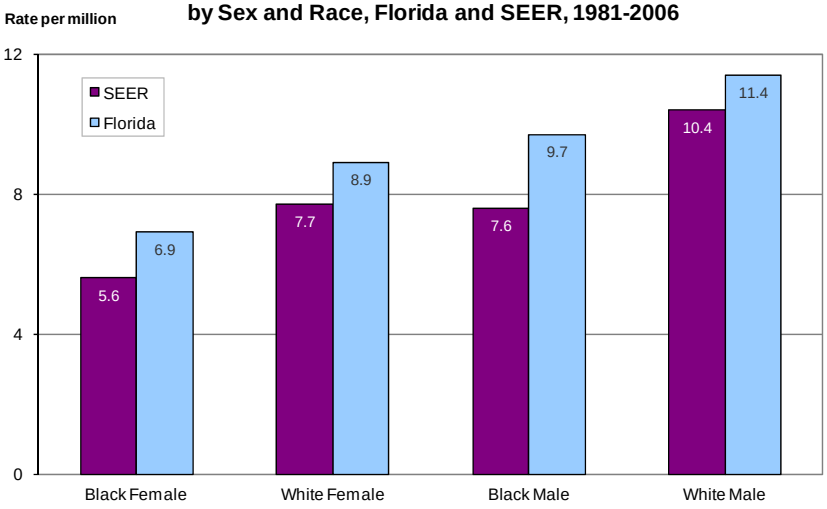
Figure VIII-5 Age-Specific and Age-Adjusted Incidence Rates of Ewing & RelatedSarcoma by Race, Florida, 1981-2007



SEER

Figure VIII-6 reports the bone tumor incidence rate by sex and race for Florida and the SEER. Across race and sex Florida rates were higher than rates for SEER, although only slightly. The greatest rate difference was observed for Black males with a rate of 9.7 per million in Florida and 7.5 per million in the SEER population.

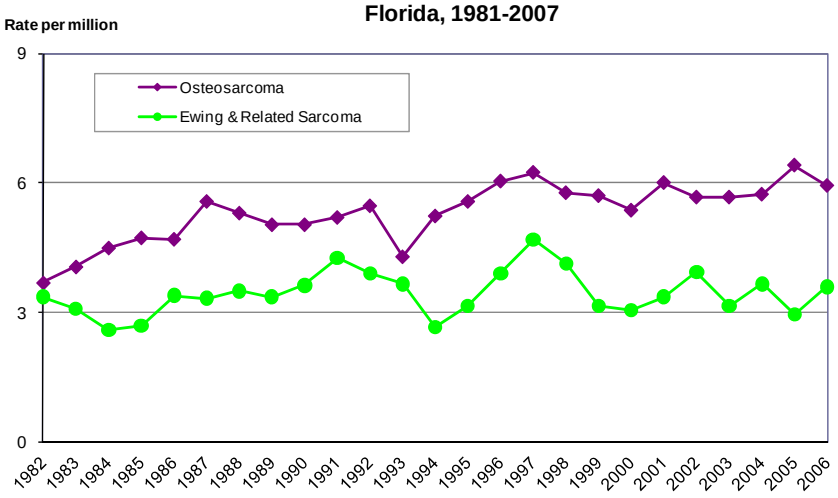
Figure VIII-6. Age-Adjusted Incidence Rates of Malignant Bone Tumors by Sex and Race, Florida and SEER, 1981-2006



TRENDS

Trends in malignant bone tumor incidence rates are shown in Figure VII-7. Incidence rates were variable over time for both osteosarcoma and Ewing and related sarcoma, with greater fluctuations in osteosarcoma. Neither subtype increased significantly over time, with smaller changes observed in Ewing and related sarcoma rates.

Figure VIII-7. Trends in Age-Adjusted Incidence Rates of Malignant Bone Tumors by ICCC Subcategory, Florida, 1981-2007



* Trends are 3-year moving avrages.

ICCC IX. SOFT TISSUE SARCOMAS

Soft tissue sarcomas (STS) accounted for 7.5 percent of all pediatric cancers in Florida with an incidence rate of 12 per million. Soft tissue sarcomas are made up of many histological types as depicted in Table IX-1. The most common form of soft tissue sarcoma among children and adolescents was rhabdomyosarcoma, with an incidence rate of 5.2 per million. Fibrosarcoma and Kaposi sarcoma were also among common types at a rate of 1.4 and 0.6 per million, respectively.

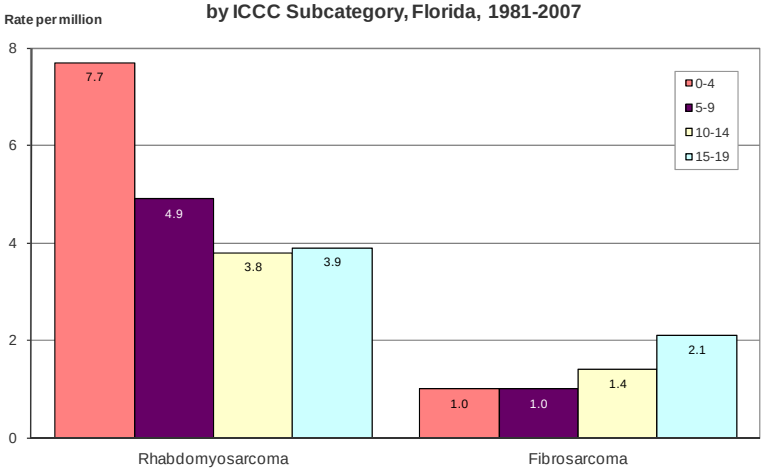
Table IX-1. Counts and Age-Specific and Age-Adjusted Incidence Rates of Soft Tissue Sarcoma by Subcategory, Florida, 1981-2007

	0-4		5-9		10-14		15-19		<15		<20	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
IX All Soft tissue Sarcoma	318	13.2	216	9	278	11.5	360	14.6	812	11.2	1,172	12
IX(a) Rhabdomyosarcoma	186	7.7	117	4.9	93	3.8	97	3.9	396	5.4	493	5.1
IX(b) Fibrosarcoma	25	1	23	1	34	1.4	52	2.1	82	1.1	134	1.4
IX(c) Kaposi sarcoma	42	1.7	2	0.1	2	0.1	10	0.4	46	0.6	56	0.6
IX(d) Other specified soft tissue sarcoma	45	1.9	51	2.1	108	4.5	151	6.1	204	2.8	355	3.7
IX(e) Unspecified soft tissue sarcoma	20	0.8	23	1	41	1.7	50	2	84	1.2	134	1.4

AGE

Figure IX-1 reports age adjusted incidence rates by age group and STS type. In Florida, rhabdomyosarcoma was more common than fibrosarcoma across age groups, predominantly affecting children younger than 5 years of age. Conversely, the incidence rate for fibrosarcoma was highest in the older age categories.

Figure IX-1. Age-Specific Incidence Rates of Soft Tissue Sarcoma by ICCC Subcategory, Florida, 1981-2007

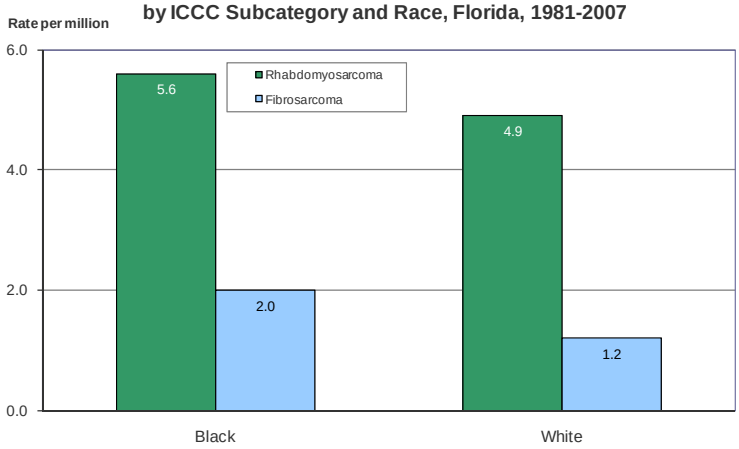


RACE AND SEX

Pediatric incidence rates for both rhabdomyosarcoma and fibrosarcoma were higher among Blacks than for Whites, although by a small margin. Rates are shown in Figure IX-2.

Figure IX-3 reports rate differences by sex and race for the Florida and SEER populations. Rates were highest among Black males and females in Florida compared to Blacks in the SEER population. Rates for White males and females, however, were higher in the SEER population than among those groups in the Florida population.

Figure IX-2. Age-Adjusted Incidence Rates of Soft Tissue Sarcoma by ICCC Subcategory and Race, Florida, 1981-2007



TRENDS

Figure IX-4 depicts average incidence rate trends for STS, rhabdomysarcoma, and fibrosarcoma between 1982 and 2006. Initially, there was an upward trend in rates for STS until the year 1988 after which declining rates were observed. Since the year 2000, however, rates continued to increase and eventually reached a peak in 2006 at a rate of 16 per million. The trends for rhabdomysarcoma and fibrosarcoma were much more stable over time, with very little change in rates for fibrosarcoma.

Figure IX-3. Age-Adjusted Incidence Rates of Soft Tissue Sarcoma by Sex and Race, Florida and SEER, 1981-2006

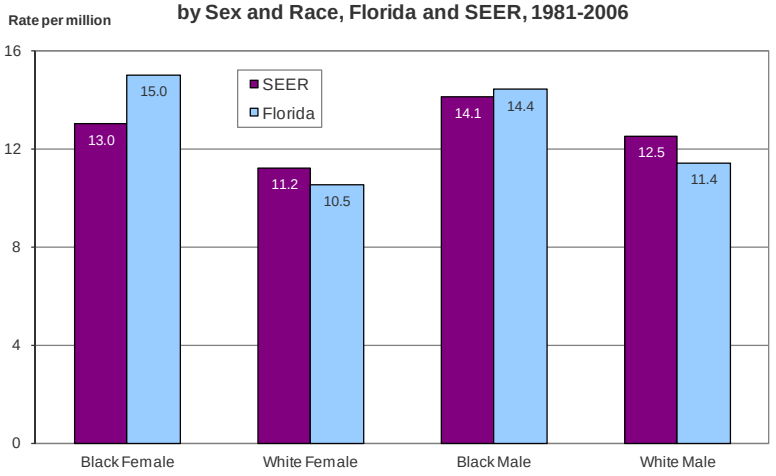
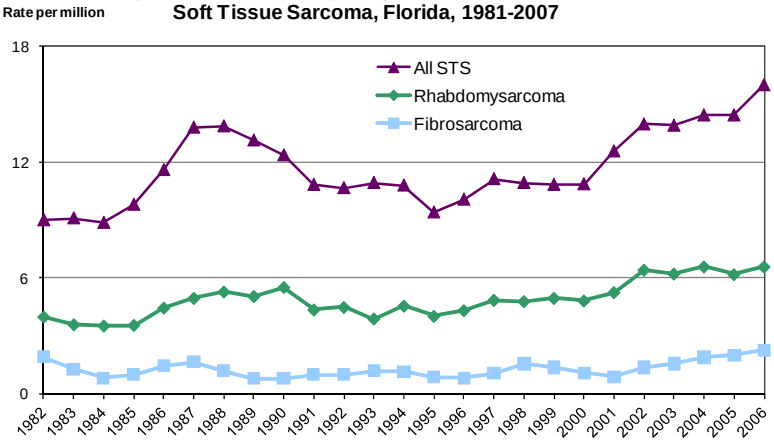


Figure IX-4. Trend in Age-Adjusted Incidence Rate of Soft Tissue Sarcoma, Florida, 1981-2007



* Trend is a 3-year moving average.

ICCC X. GERM CELL & TROPHOBLASTIC TUMORS & OTHER GONADAL TUMORS

Germ cell, trophoblastic and gonadal tumors make up 5.8 percent of all pediatric cases in Florida. As is common with many tumors, these tumors are made up of various histological types, as reported in Table X-1. Among the most common types are malignant gonadal germ cell tumors with a rate of 5.8 per million, and were consistently higher across age categories.

Table X-1. Counts and Age-Specific and Age-Adjusted Incidence Rates of Germ Cell Neoplasms by ICCC Subcategory, Florida 1981-2007

	0-4		5-9		10-14		15-19		<15		<20	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
X Germ cell & trophoblastic tumors & neoplasms of gonads	140	5.8	42	1.7	160	6.6	561	22.7	342	4.7	903	9.2
X(a) Intracranial & intraspinal germ cell	15	0.6	20	0.8	41	1.7	38	1.5	76	1.1	114	1.2
X(b) Extracranial & extragonadal germ cell	63	2.6	2	0.1	9	0.4	55	2.2	74	1	129	1.3
X(c) Malignant gonadal germ cell tumors	59	2.4	19	0.8	98	4	391	15.8	176	2.4	567	5.8
X(d) Gonadal carcinomas	0	0	0	0	5	0.2	56	2.3	5	0.1	61	0.6
X(e) Other and unspecified gonadal	3	0.1	1	0	7	0.3	21	0.9	11	0.2	32	0.3

Rates are per 1,000,000 and age-adjusted to the 2000 US Std Population

AGE

Figure X-1 reports age specific incidence rates by germ cell type. Within germ cell neoplasms, gonadal germ cell tumors lead all other types across age groups with the exception of the 0 to 4 category, and were highest among adolescents at a rate of 15.8 per million.

SEX

Incidence rates of germ cell neoplasms vary by sex and age with higher rates among males within each age category with the exception of the 10 to 14 age group where females exceed the male rate at 9.2 per million compared to 4.1 per million. Rates for germ cell neoplasms continued to dominate among adolescents compared to younger children.

Figure X-3 displays incidence rates by sex and germ cell type. Malignant gonadal germ cell tumors had the highest rate for both females (4.3 per million) and males (7.2 per million). Rates for extracranial & extragonadal tumors were higher in females than in males, as was the case for gonadal carcinomas.

Figure X-1. Age-Specific and Age-Adjusted Incidence Rates of Germ Cell Neoplasms by ICCC Subcategory, Florida, 1981-2007

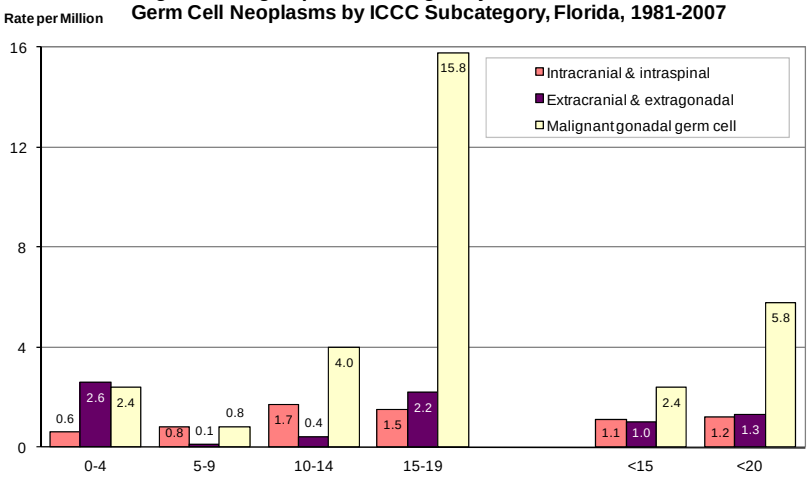
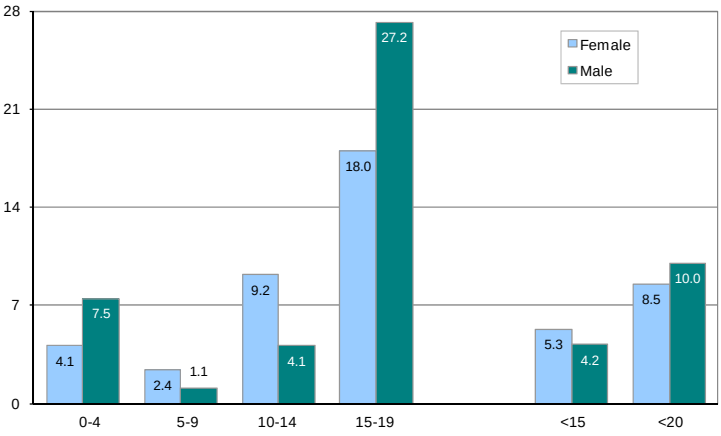


Figure X-2. Age-Specific and Age-Adjusted Incidence Rates of Germ Cell Neoplasms by Sex and Age, Florida, 1981-2007



RACE

Incidence rates for germ cell neoplasms varied by race and by age, shown in Figure X-4. Rates were highest among both white and black adolescents and lowest among those age 5 to 9 years. Across age, rates for germ cell neoplasms were higher among Whites (10.2 per million) than among Blacks (5.7 per million). This pattern was observed across age groups with the greatest rate difference among adolescents.

SEER

Incidence rate comparisons between Florida and SEER populations are reported in Figure X-5 by sex and race. Incidence rates are comparable between Florida and SEER across groups with slightly higher rates in the SEER population. White males had the highest rates for both SEER and Florida (13.8 and 12.0 per million, respectively), while Black males had the lowest rates (4.4 and 2.2 per million).

TRENDS

The average incidence rate trends are shown in Figure X-6. Rates varied slightly over the study period and fluctuated between a rate of 7.9 per million and 10.8 per million. By the year 2006 rates dropped back to a rate of 8.9 per million.

Figure X-3. Age-Adjusted Incidence Rates of Germ Cell Neoplasms by ICCC Subcategory and Sex, Florida, 1981-2007

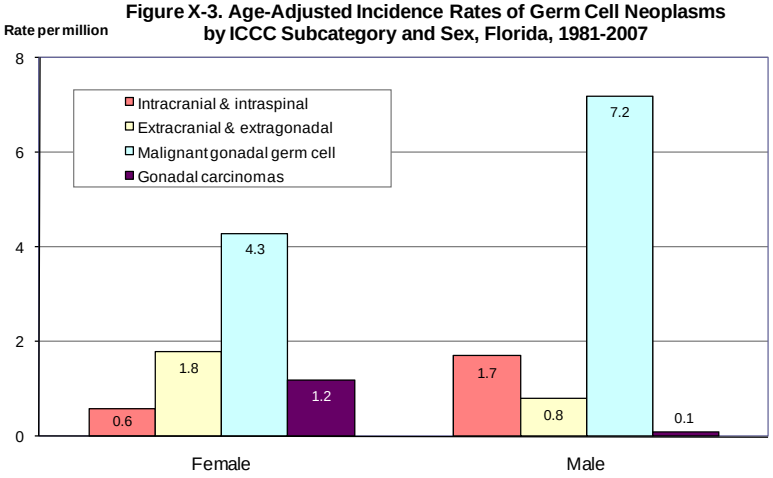


Figure X-4. Age-Specific and Age-Adjusted Incidence Rates of Germ Cell Neoplasms by Race and Age, Florida, 1981-2007

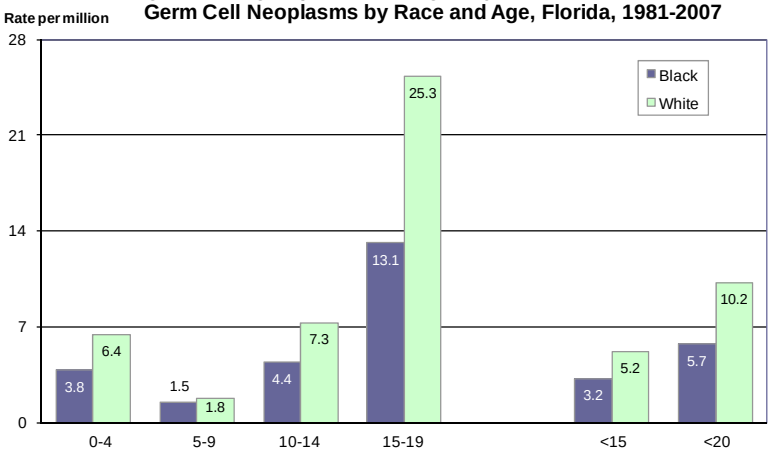


Figure X-5. Age-Adjusted Rates of Germ Cell Neoplasms by Sex and Race, Florida and SEER, 1981-2006

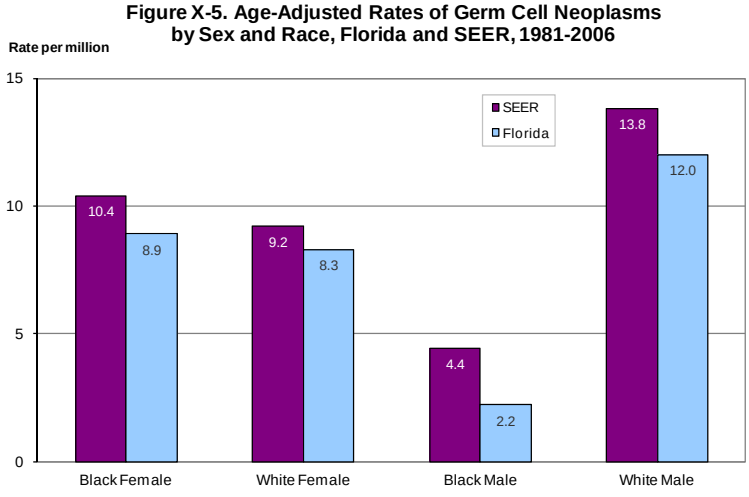
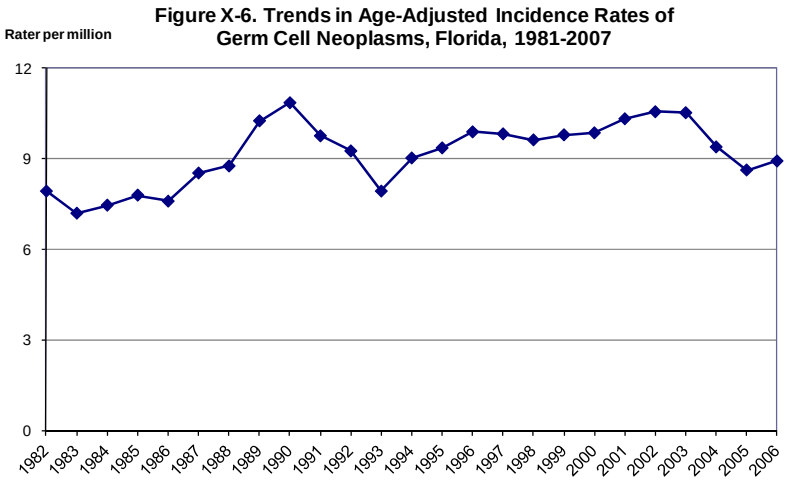


Figure X-6. Trends in Age-Adjusted Incidence Rates of Germ Cell Neoplasms, Florida, 1981-2007



* Trend is a 3-year moving average.

ICCC XI. OTHER EPITHELIAL NEOPLASMS & MELANOMA

Pediatric carcinomas and malignant melanomas are relatively rare compared to occurrence in adults. Within the pediatric population in Florida, incidence rates for other epithelial neoplasms and melanomas ranged from 2.2 per million for younger children, to 37.3 per million for adolescents. This category of cancers is composed of a variety of different types of cancers including adrenocortical, thyroid, nasopharyngeal and skin carcinomas, as well as malignant melanomas and other uspecified carcinomas. Age specific incidence rates by carcinoma type and sex are displayed in Table XI-1.

Table XI-1. Age-Specific Incidence Rates of Other Epithelial & Melanoma by ICCC Subcategory and Sex, Florida, 1981-2007

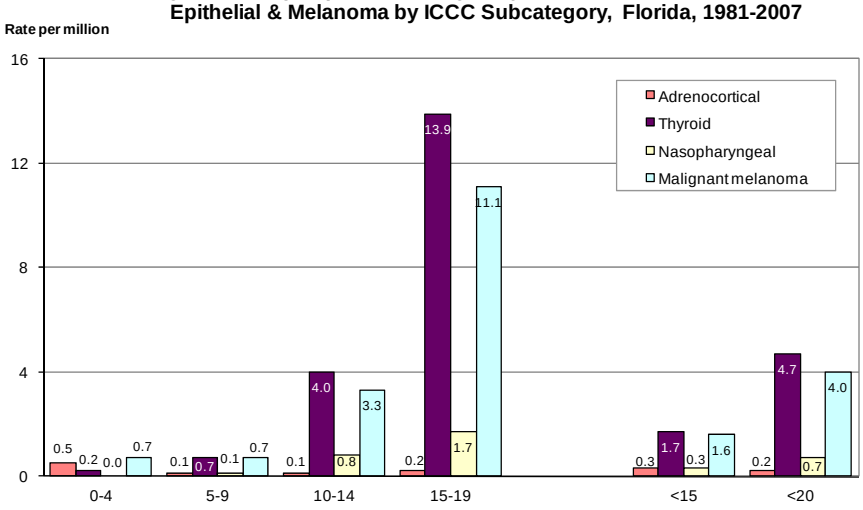
	Age Group	Total	Female	Male
XI Other malignant epithelial neoplasm and melanoma	0-4	2.2	2.1	2.3
	5-9	2.2	1.7	2.7
	10-14	11.6	14.1	9.1
	15-19	37.3	48.4	26.7
XI(a) Adrenocortical carcinoma	0-4	0.5	0.7	0.4
	5-9	0.1	0.2	0.1
	10-14	0.1	0.3	0
	15-19	0.2	0.2	0.2
XI(b) Thyroid carcinoma	0-4	0.2	0.3	0.2
	5-9	0.7	0.8	0.6
	10-14	4	6.1	2.1
	15-19	13.9	23.8	4.4
XI(c) Nasopharyngeal carcinoma	0-4	0	0	0
	5-9	0.1	0	0.2
	10-14	0.8	0.8	0.9
	15-19	1.7	1.4	2
XI(d) Malignant melanoma	0-4	0.7	0.7	0.6
	5-9	0.7	0.6	0.8
	10-14	3.3	2.9	3.7
	15-19	11.1	12.7	9.6
XI(e) Skin carcinoma	0-4	0	0	0
	5-9	0	0	0.1
	10-14	0.1	0.2	0.1
	15-19	0	0.1	0
XI(f) Other and unspecified carcinomas	0-4	0.8	0.5	1.1
	5-9	0.5	0.2	0.9
	10-14	3.1	4	2.3
	15-19	10.4	10.2	10.6

Rates are per 1,000,000 and age-adjusted to the 2000 US Std Population

AGE

Incidence rates for specific types of epithelial neoplasms and melanoma are reported in Figure XI-1. The distribution of rates by age is lowest in younger children, increases with age, and finally peaks in the 15 to 19 age category. Both thyroid carcinomas and malignant melanomas were the leading cancer types across all age groups.

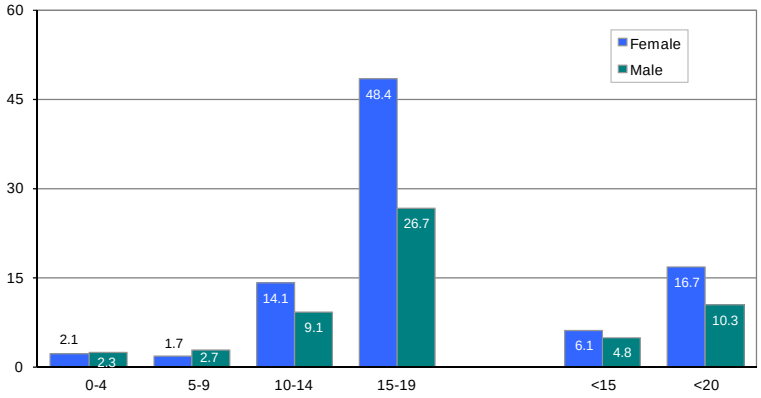
Figure XI-1. Age-Specific and Age-Adjusted Incidence Rates of Other Epithelial & Melanoma by ICCC Subcategory, Florida, 1981-2007



SEX

Male and female incidence rates are displayed in Figure XI-2. Overall rates were highest among females, but this varied by age category. Incidence rates were slightly higher for males among younger children than for females, and the reverse was observed in the 10 to 14 and 15 to 19 age categories.

Figure XI-2. Age-Specific and Age-Adjusted Incidence Rates of All Other Epithelial & Melanoma by Sex, Florida, 1981-2007



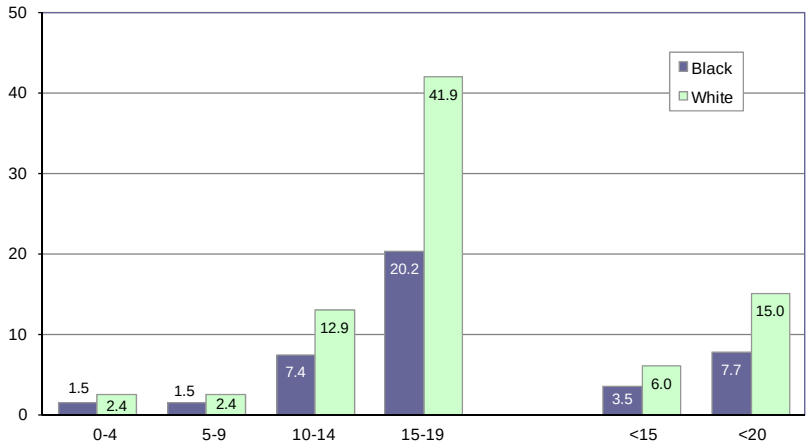
RACE

Across age groups whites had higher incidence rates than did Blacks with the greatest difference occurring among adolescents, where rates for whites were double that for Blacks.

SEER

Figure XI-4 displays rates by sex and race combined for both SEER and Florida populations. White females had the highest incidence of all types of epithelial and melanomas and were greater in the SEER population (23.3 per million) than in the Florida population (18.2 per million). Incidence rates for Black males were lowest for both SEER and Florida populations (6.8 and 6.6 per million).

Figure XI-3. Age-Specific and Age-Adjusted Incidence Rates of Other Epithelial & Melanoma by Race, Florida, 1981-2007



TRENDS

Average incidence rate trends are displayed in Figure XI-5 showing a general upward trend in rates between 1982 and 2006 for both thyroid carcinoma and malignant melanoma. In particular, rates for malignant melanoma have been steadily increasing since 1994, while rates for thyroid carcinoma increased more dramatically beginning from the year 2003.

Figure XI-4. Age-Adjusted Incidence Rates of Other Epithelial & Melanoma by Sex and Race, Florida and SEER, 1981-2006

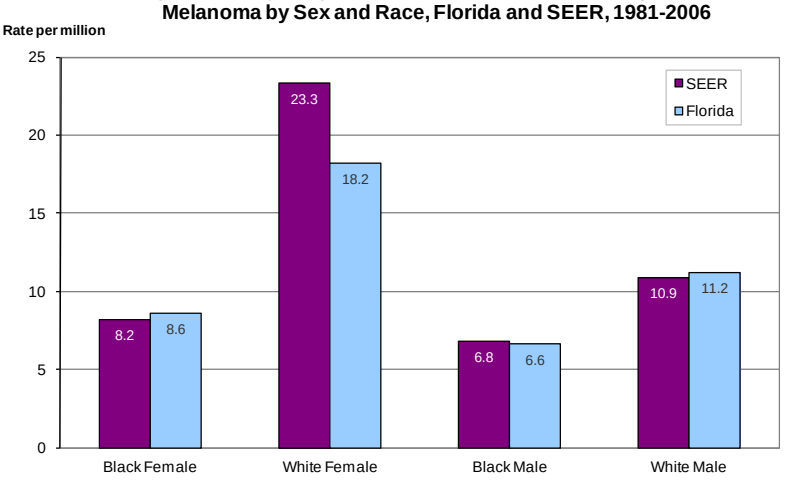
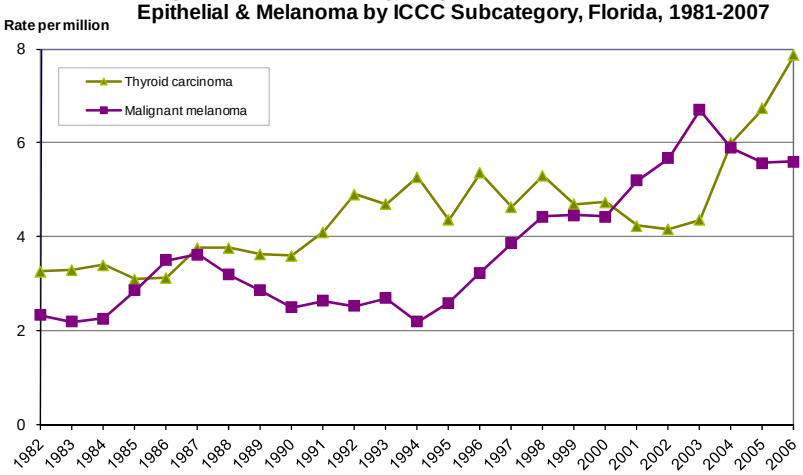


Figure XI-5. Trends in Age-Adjusted Incidence Rates of Other Epithelial & Melanoma by ICCC Subcategory, Florida, 1981-2007



* Trends are 3-year moving averages.