After accidents, cancer is the second leading cause of death in children ages 1 to 14. In 2019, it is estimated that there will be 10,590 new cases and 1,190 deaths from cancer among children and adolescents in the United States. Unlike many adult cancers, childhood and adolescent cancers are not strongly linked to lifestyle or environmental risk factors. Causes of child and adolescent cancer are mostly unknown. Certain chromosomes, genetic syndromes, and ionizing radiation exposure has been linked to a small percentage of cases.

New Cases of Childhood and Adolescent Cancer

Childhood cancer is defined as being diagnosed between ages zero and 14. Adolescent cancer is defined as being diagnosed between ages 15 and 19. One in 408 children will be diagnosed with cancer before the age of 15 and one in 285 children will be diagnosed with cancer before the age of 20. Cancer rates among adolescents are higher compared to rates among children.

In 2016, there were 165 cancer cases per 1,000,000 children and 248 cancer cases per 1,000,000 adolescents in Michigan.

In Michigan, male children have a higher rate of cancer compared to females (173 per 1,000,000 vs 147 per 1,000,000); however, this difference is not statistically significant.

Female adolescents have a higher rate compared to males (274 per 1,000,000 vs 216 per 1,000,000); however, this difference is not statistically significant.

Diagnosis of cancer among White children and adolescents have a higher diagnosis rate compared to Black children and adolescents. These differences are not statistically significant.
Cancer Types among Children and Adolescents

- The type of cancers that develop in children differ from that in adults.
- Adult cancers are classified by site, whereas cancer in children and adolescents are classified by tissue type into 12 major groups using the International Classification of Childhood Cancers (ICCC).

Lymphoid leukemia was the most common cancer diagnosed among male children (42 per 1,000,000) and made up 24% of all cancer diagnoses among male children.

Brain and other parts of the central nervous system (CNS) was the most common cancer diagnosed among female children (32 per 1,000,000) and made up 22% of all cancer diagnoses among female children.

Germ cell tumors were the most common cancer diagnosed among male adolescents (51 per 1,000,000) and made up 22% of all cancer diagnoses among male adolescents.

Thyroid cancer was the most common cancer diagnosed among female adolescents (53 per 1,000,000) and made up 20% of all cancer diagnoses among female adolescents in Michigan. This is significantly higher than the U.S. rate for thyroid cancer among adolescents (32 per 1,000,000).
Michigan Cancer Deaths among Children and Adolescents

- From 2002 to 2016, deaths from cancer have decreased 53% among children and 27% among adolescents. (data not shown)
- Black children die from cancer at a higher rate compared to White children (23 per 1,000,000 vs 20 per 1,000,000); however, this difference is not statistically significant.
- Male adolescents die from cancer at a higher rate compared to female adolescents (35 per 1,000,000 vs 21 per 1,000,000); however, this difference is not statistically significant.
- White adolescents die from cancer at a higher rate compared to Black adolescents (30 per 1,000,000 vs 24 per 1,000,000); however, this difference is not statistically significant.
- Brain cancer caused 35% of cancer-related deaths among male children and leukemia caused 28% of cancer-related deaths among female children.
- Bone cancer caused 35% and 38% of cancer-related deaths among male and female adolescents respectively.

Survival and Late Effects

- Survival rates have improved over the last 50 years. In 2008-2014, 83% of children and 85% of adolescents diagnosed with cancer survived at least five years.
- As of 2015 it is estimated that there are 429,000 survivors of childhood or adolescent cancer in the U.S.
- The Children’s Oncology Group (COG) long-term follow-up guidelines can serve as a resource for providers: http://www.survivorshipguidelines.org/.
- Survivors are at an increased risk for health problems throughout their lifetime and includes a heightened risk for a second cancer later in life.
- Other late effects can include problems with: reproduction, growth, memory, cardiovascular disease, breathing, digestion, hearing, and seeing.
- These individuals may also experience long term financial burden due to life-long medical care.

Clinical Trials

- Over 90% of children and adolescents diagnosed with cancer are treated at a cancer center that is affiliated with the National Cancer Institute-supported Children’s Oncology Group.
- Over 4,000 children diagnosed with cancer in the U.S. enroll in a COG sponsored clinical trial per year.
- There are seven COG locations in Michigan. A complete directory of COG locations can be found here: www.childrensoncologygroup.org.
- To learn more about children’s cancer centers that belong to COG call: 1-800-4-CANCER.

References: