

A Case Study of Pediatric Cancer Rates in Southwest Washington



Trey Foote Foundation



Washington State University



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CASE STUDY OF PEDIATRIC CANCER RATES IN SOUTHWEST WASHINGTON

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Case Study of Pediatric Cancer Rates in Southwest Washington

Problem Overview

The Trey Foote Foundation sponsored a study specific to Osteosarcoma. The results of their preliminary research were that a child living in Southwest Washington is 1.7 – 2.7 as likely to be diagnosed with Osteosarcoma then in other areas of the United States and the statistics are rising. The Foundations hypothesis is if the rates of Osteosarcoma are higher other pediatric cancer rates may be higher as well. There are several goals of this study. First, is to statistically look at the rates of pediatric cancers in Southwest Washington and compare the results to national averages of expected vs. observed. Secondly, to do an epidemiological study on any particular pediatric cancer statistics rates are above any accepted standard deviation.

According to the US Census (2006), there are 299,398,485 people in the United States +/-0.1%. There are 147,434,940 Males and 151,963,545 Females. For this study a focus will be placed on children under the age of 20, which represents 27.5% of the total population or 82,334,583 children in the United States. The US Census data (2000) State of Washington has a total population of 5,894,121. Children ages 0-19 make up 28.6% of the total State's population or 1,685,719 children, which is 0.9% higher then the national average. Finally, Clark County has a population of 115, 843 children under 20 years of age. On a percentage basis Clark County is 4.9% higher than Washington State and 6% higher than the US for children 0-19 of age.

	<u>Total population <20:</u>	<u>Percentage of population</u>
United States	82,334,583	27.5%
Washington	1,685,719	28.6%
Clark County, WA	115,843	33.5%

Project Overview

This is a joint research project between the Trey Foote Foundation, Washington State University, and Oregon Health Sciences University and Clackamas Community College.

Types of Pediatric Cancer in scope

<p><u>Leukemia</u></p> <ul style="list-style-type: none"> • Acute Lymphoblastic (ALL) • Acute Myelogenous (AML) 	<p><u>Cancer of the Nervous System</u></p> <ul style="list-style-type: none"> • Brain Tumors • Neuroblastoma 	<p><u>Sarcomas</u></p> <ul style="list-style-type: none"> • Osteosarcoma • Ewings Sarcoma • Soft Tissue Sarcomas
<p><u>Lymphomas</u></p> <ul style="list-style-type: none"> • Hodgkin Lymphoma • Non-Hodgkin Lymphoma 	<p><u>Solid Cancer</u></p> <ul style="list-style-type: none"> • Liver • Kidney • Other Solid tumors 	<p><u>Rare Cancers</u></p> <ul style="list-style-type: none"> • Melanoma • Stomach

Pediatric Cancer definitions

Leukemia

Leukemia is a cancer of the bone marrow and tissues which produce the circulating blood cells. Leukemias are the most common childhood cancers. Types of leukemia include:

- **Acute Lymphoblastic Leukemia (ALL):** The most common childhood cancer. Almost 75% of children with leukemia have ALL, a cancer of the lymphoid cells in the bone marrow and the lymphoid organs of the body. They are involved in the body's immune system.
- **Acute Myelogenous Leukemia (AML):** AML (also called acute myeloid leukemia, acute nonlymphatic leukemia or ANLL) is cancer of the myeloid blood cells which are produced in the bone marrow and which help fight bacterial infections.

Cancers of the Central Nervous System

- **Brain tumors:** There are many types of brain tumors; the most common are called gliomas.
- **Neuroblastoma:** is a cancer of the sympathetic nervous system which most often originates in the adrenal glands above the kidney.

Sarcomas

Sarcomas are cancerous tumors involving the bones and soft tissues.

- **Bone cancers**
 - **Osteosarcoma:** the most common type of bone sarcoma. These tumors often are located at the growing end of the long bones of the extremities, close to the joints.
 - **Ewings Sarcoma:** a bone cancer that often appears in the middle of the bone. Commonly found in the thighs, hipbones, upper arms and ribs.
- **Soft Tissue Sarcomas:**
 - **Rhabdomyosarcoma:** a soft tissue sarcoma that develops in muscles. Most often found in the head, neck, kidneys, bladder, arms and legs.

Lymphomas

Lymphoma is a tumor of the lymph tissues, which are part of the immune system. Types of lymphoma include:

- **Hodgkin disease or Hodgkin's lymphoma:** affects lymph nodes nearer to the body's surface, such as in the neck, armpit and groin area.
- **Non-Hodgkin Lymphoma:** affect lymph nodes found deep within the body. There are many types of lymphoma, include Burkitt's, non-Burkitt's, and lymphoblastic lymphoma.

Solid Cancers

Liver cancer

- **Hepatoblastoma**
- **Hepatocellular carcinoma**

Cancers of the Kidney

- **Wilms tumor:** also called nephroblastoma
- **Clear Cell Sarcoma**

Other Types of Solid Cancers

- **Retinoblastoma:** is a malignant tumor of the retina (a thin membrane in the back of the eye).
- **Germ Cell Tumors:** Germ cell tumors appear most commonly in the testes, the ovaries, the area at the bottom of the spine (sacrococcygeal) and in the middle of the brain, chest or abdomen.

Rare Cancers

Rare cancer – Cancers that rarely occur in children but have been observed.

- **Melanoma (skin)**
- **Stomach**

IRB Requirements

It is estimated that 90% of the children diagnosed with Cancer in Southwest Washington will be treated at one of two hospitals, Doernbecher Children’s hospital or Providence Emanuel hospital. While there may be children treated at other locations these two hospitals will be our first sites of data collection. The IRB to gain access to the data will be written by Dr. Suman Malempati with OHSU. The data elements included in the scope of the IRB are:

County	Zip Code	Age	Gender	Date Diagnosed	Initial Diagnosis	Mortality
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All pediatric cancer cases treated at these facilities will be reviewed, the data collected, and stored, but only children in Southwest Washington will be the focus of the initial study.

Data Collection

Washington State University will be the primary resources used to collect and store the data, under the supervision of Dr. J.P. Garofalo. Dr. Garofalo will use Graduate students to go onsite to perform the case reviews and data collection. A database will be created within the WSU infrastructure and the information collected will be input and stored in this database.

It is important to note that all data collected will follow HIPPA guidelines.