

# Dover Township

## Childhood Cancer Investigation

### Childhood Cancer Incidence Health Consultation Update of Cancer Statistics

This update contains statistics for childhood cancers in Ocean County, Dover Township, and Toms River, from 1979 through 1995.

#### Background

All newly diagnosed primary neoplasms (except certain skin carcinomas, and, since 1995, carcinoma in-situ of the cervix) in New Jersey residents must be reported to the New Jersey State Cancer Registry. In addition to reports filed by New Jersey physicians, hospitals, dentists, and laboratories, there are reciprocity agreements with New York, Pennsylvania, Delaware and Florida to report cancers of New Jersey residents diagnosed in out-of-state

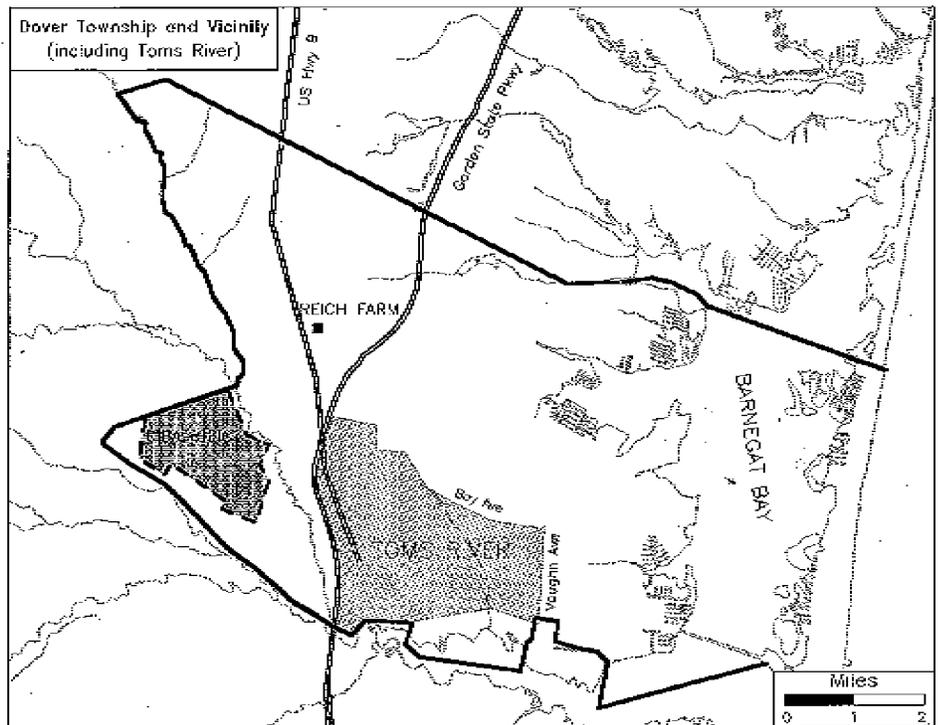


Figure 1. Toms River boundaries in Dover Township

---

#### Summary of Childhood Cancer Incidence: 1979 - 1995

**Overall, childhood cancer incidence in Ocean County was similar to the State. Neuroblastoma incidence was elevated, particularly in males under age five. One type of brain cancer (astrocytoma) was also elevated.**

**Dover Township was the only municipality in Ocean County in which overall childhood cancer incidence was elevated. Leukemia incidence was elevated in females, particularly under age five.**

**Overall childhood cancer incidence was elevated in the Toms River section of Dover Township. This elevation was seen in female children under age five, especially for leukemia and brain/CNS cancer.**

---

facilities. For the earlier childhood cancer incidence analysis, which was discussed in Health Care Provider Update No. 1 (August 1996) statistics on incidence were available from 1979 through 1991. During that reporting period, there was a statistically significant elevation in the rate of brain and central nervous system cancers among children under the age of five in Ocean County and Toms River,

and in children through age 19 years in Ocean County.

The purpose of the Childhood Cancer Incidence Analysis Health Consultation is to update the evaluation of the incidence of childhood cancer in Dover Township through 1995, and to find out which cancer types are elevated in order to develop follow-up strategies for any elevations in Dover Township.

### Ascertainment of Childhood Cancer Cases

The New Jersey State Cancer Registry has audited area hospitals, corresponded with pediatricians in Ocean and Monmouth Counties, and contacted all New Jersey hospitals and major childhood cancer centers in Philadelphia and New York to ensure completeness of registry data for children. The Registry also

### Childhood Cancer Cases 1979 through 1995

	Birth through Nineteen Years			Birth through Four Years <sup>†</sup>		
	Number Expected* <sup>^</sup>	Number Observed	SIR	Number Expected* <sup>^</sup>	Number Observed	SIR
<b><u>Ocean County</u></b>						
All cancers	340	358	1.05	102	117	1.14
Brain/CNS	58	70	1.22	17	24	1.44
Leukemia	78	81	1.04	33	36	1.11
Neuroblastoma	16	27	1.70**	13	24	
1.81**						
In males only	9.1	20	2.20**	7.7	17	
2.21**						
Astrocytoma	24	35	1.46**	6.2	11	1.77
<b><u>Dover Township</u></b>						
All cancers	67	90	1.34**	17	26	1.51
Brain/CNS	11	13	1.16	2.8	5	1.78
Leukemia	15	22	1.50	5.5	9	1.64
In females only	6.5	13	1.99**	2.7	7	
2.65**						
Neuroblastoma	2.8	4	1.45	2.2	4	1.79
<b><u>Toms River</u></b>						
All cancers	14	24	1.70**	3.5	13	
3.73**						
Brain/CNS	2.3	6	2.58	0.6	4	7.04**
Leukemia	3.1	6	1.97	1.1	4	3.61
In females only	1.3	4	3.06	0.5	4	7.84**
Neuroblastoma	0.6	2	3.56	0.5	2	4.42

<sup>†</sup> These cases are included in the Birth through Nineteen Years cases

\* Based on the New Jersey State rates applied to the population of the community

<sup>^</sup> Rounded to nearest integer

\*\* Statistically significant

## Analysis of Cancer Data and Statistical Significance

The analysis of cancer rates is performed using Standardized Incidence Ratios (SIR). The SIR is calculated by dividing the observed number of cases by the expected number. For this series of analyses, the expected number was based on the average annual New Jersey age-sex-specific incidence rate for the selected cancers from 1979 to 1995 applied to the population of the community of interest. In other words, the expected number is that which would have occurred if the cancer rate in the community was the same as the State rate during the time period of study.

Evaluation of the SIR is by comparing it to 1.0. When the SIR is less than 1.0, fewer cases have been observed than expected. When the SIR is greater than 1.0, there are more cases than were expected. The 95% confidence interval is the statistical test used to evaluate whether the difference between observed and expected numbers may be due to random variation. If the confidence interval does not include 1.0, then the difference between the observed and expected numbers is considered to be "statistically significant."

compared lists of children with cancer that have been identified by a local support group (Ocean of Love) to those of the New Jersey State Cancer Registry in order to update its records where necessary. Complete information on childhood cancer incidence in the entire State through 1995 is now available.

All childhood cancers combined and groupings of selected childhood cancer types as defined by the International Classification of Childhood Cancer were evaluated. These selected groups and subgroups were:

- ! total brain/central nervous system cancers and astrocytoma;
- ! sympathetic nervous system tumors and neuroblastoma;
- ! Wilms' tumor;
- ! malignant bone cancer;
- ! soft tissue sarcomas;
- ! total leukemia and acute

lymphocytic leukemia;  
! total lymphoma, Hodgkin's disease and non-Hodgkin's lymphoma.

Any child who was under age twenty years and a resident of Ocean County, Dover Township, or Toms River at the time of initial diagnosis of cancer during the time period of January 1979 through December 1995 was included in the analysis.

### Update of Childhood Cancer Rates

Ocean County: Overall childhood cancer incidence was the same as New Jersey state rates. Sympathetic nervous system cancer incidence was statistically elevated, primarily due to neuroblastoma in males under the age of five years. Total brain/CNS cancers were elevated, although not statistically significant. One subtypes of brain/CNS cancer,

astrocytoma, was significantly elevated in the county among children through age nineteen years (35 observed vs. 24 expected; SIR=1.46).

Part of the analysis included examining cancer rates for each municipality in Ocean County to ensure that no statistically significant elevation was missed. Among Ocean County municipalities, only Dover Township had a statistically significant elevation of the total cancer incidence rate.

Dover Township: Among Dover Township residents under age twenty, there were statistically significant increased rates for all cancers combined, and for leukemias in females. In children under five years of age, there was a statistically significant increase in the rates of all cancers and leukemias in females. In this age group, all of the leukemia cases were acute lymphocytic leukemia.

Toms River: Among Toms River residents under age twenty there was a statistically significant increase for all cancers. There were statistically significant increases in all cancers, brain/CNS cancers, and leukemia in female children, under age five.

### Time Trends

Cancer incidence for each year for New Jersey, Ocean County, Dover Township, and Toms River was also examined. Both the State and the County had similar and slightly increasing rates from 1979 through 1995. Dover

Township rates began rising above the State rates beginning in 1985. The Toms River rates are the most variable, due to the small numbers of cases, but peaked from 1988 through 1990, when eight of the total number of cases (twenty-four) were diagnosed.

## Discussion

Elevations in overall childhood cancer incidence over the study period were found in Dover Township and the Toms River section of the Township. These excesses were identified in comparison to average State cancer incidence for all races.

Interpretation of these data should be done very cautiously. Many of the analyses were conducted using a relatively small number of cases. Small but random variations in the observed number could have a major impact on the SIR analysis.

There is no information available from the State Cancer Registry on risk factors, potential environmental exposures, or residential history prior to time of diagnosis. The causes of leukemia, brain/CNS cancers, and other cancers in children are largely unknown.

## Recommendations and Future Actions Planned

As a result of this updated analysis, the New Jersey Department of Health and Senior Services is conducting these follow-up activities.

! An epidemiological evaluation of childhood

cancer in Dover Township is underway. The New Jersey Department of Health and Senior Services, in consultation with the Agency for Toxic Substances and Disease Registry, is designing a case-control study involving both records reviews and interviews. As part of this study, residential histories will be collected in order to more adequately evaluate potential environmental factors related to residential locations from conception to diagnosis. Other factors to be examined include parental occupational histories, diet, medical histories, and other plausible causal factors.

! Analysis of space-time clustering of cases will be explored after collection of residential history information, in conjunction with any identified environmental exposure pathways in the community.

A protocol for the case-control study is under development. Appropriate control groups are being identified by the New Jersey Department of Health and Senior Services and the Agency for Toxic Substances and Disease Registry. An expert panel, including oncologists, epidemiologists, pediatricians, tumor registry experts, and environmental health specialists, has been convened and is providing on-going review of the protocol. Institutional Review Board review has also occurred. By mid-Fall, study families will begin to receive letters to request their

participation.

Evaluations of potential environmental exposures to public and private drinking water contaminants, as well as exposures to Superfund sites, are also occurring in conjunction with the childhood cancer investigation.

---

The full text of the *Childhood Cancer Incidence Health Consultation: Review of Cancer Registry Data, 1979-1995 for Dover Township, Ocean County, New Jersey*, is available at the New Jersey Department of Health and Senior Services' Toms River Field Office. For a copy please call (732) 505-4188.

---

### **Dover Township Childhood Cancer Investigation**

NJ Department of Health and  
Senior Services  
Division of Environmental and  
Occupational Health Services  
Consumer and Environmental  
Health Services  
CN 360  
Trenton, NJ 08625-0360  
(609) 984-2193

Written by Sharon Kubiak,  
Patricia Haltmeier and  
Michael Berry,

*This update is supported in whole by funds from the Comprehensive Environmental Response, Compensation and Liability Act trust fund through a cooperative agreement with the Agency for Toxic Substances and Disease Registry, Public Health Service, US Department of Health and Human Services.*