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Evaluation of Childhood Cancer in Sandwich, Massachusetts 1995 – 2005

QUESTIONS AND ANSWERS

1. **Q. Why did the Massachusetts Department of Public Health (MDPH) evaluate the incidence of childhood cancer in Sandwich, Massachusetts?**
 - A. In 2004, a resident of Sandwich contacted the MDPH about a suspected increase in the incidence of cancer among children in Sandwich. Initial concerns focused on the recent diagnoses of children reported to have been diagnosed with leukemia and Ewing's tumors (a type of bone cancer). In response to this request, the Community Assessment Program (CAP), a division within the Center for Environmental Health (CEH) at the MDPH, compared the incidence of cancer among children (i.e., ages 0-19) diagnosed in Sandwich since 1995 to what would be expected based on the statewide experience.

2. **Q. How common is cancer in children?**
 - A. Cancer diagnoses among children and adolescents are relatively rare, in fact, they account for about 1% of all cancers diagnosed in the United States. The most common types of cancer diagnosed among children include leukemia, lymphomas, central nervous system tumors, and malignant bone tumors.

3. **Q. What data were used to evaluate childhood cancer incidence in Sandwich?**
 - A. To evaluate cancer incidence in a community, the CAP uses data from the Massachusetts Cancer Registry (MCR). The MCR collects information on cancer diagnoses (not cancer deaths) among Massachusetts residents. The eight-year period 1995 – 2002 is the period for which the most recent and complete cancer incidence data were available at the time of the Sandwich evaluation.

4. Q. How did the CAP evaluate childhood cancer incidence in Sandwich?

A. Incidence rates for childhood cancer (all types) for the town of Sandwich as a whole and for smaller geographic areas in Sandwich (i.e., census tracts) were calculated for the eight-year time period 1995 – 2002 (i.e. the most recent data available at the time of the request). In addition, because the MCR is a continual surveillance system for cancer, reports of more recent diagnoses of childhood cancer (i.e. children diagnosed during 2003 – 2005) were also reviewed and evaluated qualitatively.¹ As discussed below, a qualitative evaluation of the geographic distribution of residence at diagnosis was also conducted.

5. Q. How did the CAP review the incidence of childhood cancer at the neighborhood level?

A. To better characterize the pattern of childhood cancer incidence in Sandwich, case-specific information available from the MCR relating to type of cancer, date of diagnosis, age at diagnosis, and gender was also reviewed for each child living in Sandwich at the time of his or her cancer diagnosis.

In addition, a qualitative evaluation of the pattern of childhood cancer at a smaller geographic level (i.e., the census tract/neighborhood level) was conducted by mapping the address reported to the MCR for each child diagnosed with cancer in Sandwich between 1995 – 2005 to look for any possible concentrations of diagnoses in any one area of Sandwich. For confidentiality reasons, it is not possible to include maps showing the locations of children diagnosed with cancer in the report.

6. Q. What do the data on childhood cancer in Sandwich show to date?

A. During the time period 1995 – 2002, a total of 10 children were diagnosed with cancer in Sandwich compared to approximately 8 expected cases (based on statewide data and the population of the town). Among these 10 children, three children were diagnosed with leukemia, three children were diagnosed with a central nervous system (CNS) tumor, two children were diagnosed with soft tissue sarcomas, one child was diagnosed with a malignant bone tumor, and one child was diagnosed with Hodgkin's lymphoma. It is important to note that these cancers are among the most common cancer types diagnosed among children (i.e., ages 0-19).

Review of the more recent data (2003 – 2005) has shown that seven other children have been diagnosed with cancer: three children were diagnosed with leukemia, two children were diagnosed with CNS tumors, and two children were diagnosed with malignant bone tumors. No children were diagnosed with lymphoma or soft tissue sarcomas during this time period.

¹ Data summarized here are drawn from data entered on MCR computer files before December 31, 2005. As of January 23, 2006, no additional children from Sandwich were identified from a search of the five medical centers in Massachusetts that routinely treat pediatric oncology patients and the central cancer registry in Rhode Island.

7. Q. What did the study reveal about childhood cancer incidence in Sandwich?

- A. The elevation of childhood cancer that occurred in Sandwich during 1995 – 2002 was primarily due to an elevation among female children in CT 0135 (4 diagnoses observed versus 1.2 diagnoses expected) located in southeast Sandwich.

When age at diagnosis and cancer type was examined for each child in Sandwich diagnosed with cancer from 1995 – 2005, the information was consistent with the epidemiologic literature for the types of cancer reported.

8. Q. Did the CAP find any unusual patterns of cancer in Sandwich during 1995 - 2005?

- A. The evaluation demonstrated four children with cancer living in close proximity (within a half-mile radius) to each other in southeastern Sandwich. Three of the four children were diagnosed with leukemia and the fourth child was diagnosed with a soft tissue sarcoma. Two of the three children with leukemia were diagnosed within five months of one another. The residential history of these three children revealed that two of the children resided in their homes for approximately 3 to 3.5 years before diagnosis, the same homes that they were born in. The other child had moved from the home that he/she was born in and lived in their residence at diagnosis for two years prior to the diagnosis.

9. Q. Does the MDPH recommend any additional follow-up?

- A. Yes. Based on the observed geographic pattern of childhood cancer diagnoses in southeast Sandwich during 1995 – 2005, the MDPH recommends conducting in-person interviews with the biological mother or primary care-givers of all children diagnosed with cancer in Sandwich during 1995 – present. In addition, the MDPH will review childhood cancer incidence in the census tracts adjacent to Sandwich CT 0135. This would include CT 0131 in Barnstable and CT 0150 in Mashpee. Finally, the MDPH will review additional environmental factors including but not limited to review of available private well data.

10. Q. Did the CAP evaluate any environmental information as part of this report?

- A. Yes. The MDPH contacted the Massachusetts Department of Environmental Protection (MDEP) to obtain information on Sandwich's compliance with state and federal guidelines for drinking water. In addition, the CAP reviewed the location of groundwater contamination (plumes) originating from the Massachusetts Military Reservation (MMR).

11. Q. What did the evaluation of environmental data show?

- A. This evaluation demonstrated that no contaminated plumes from the MMR appear to be in close proximity to the residence of children diagnosed with cancer in Sandwich. It also demonstrated that the Sandwich municipal water supply had, with the exception of total coliform, no violations of health-based drinking water standards reported to the MDEP. However, only 36% of households in CT 0135 are on municipal water. Total coliforms are a

group of related bacteria that are generally harmless, are common in the environment, and serve as an indicator of the presence of other potentially harmful bacteria. According to the MDEP, follow-up sampling as required did not indicate the presence of harmful bacteria.

12. Q. What information will be collected during the follow-up interviews?

- A. Topics of interest include closer scrutiny of residential history, pregnancy history, family medical history, parental occupational history, and other available environmental data. Parents of children who provide informed consent will be asked to participate in personal interviews and a medical records review by a physician to identify any possible environmental or other factors that may have contributed to their diagnosis.

13. Q. How and when will families be contacted to participate?

- A. To contact the parents of children from Sandwich who have been reported to the MCR with a diagnosis of cancer since 1995, the CAP must first prepare and submit an application package to the MDPH 24A research review committee for approval. The 24A application process is standard procedure for any research that involves human subjects and allows the Commissioner of MDPH to ensure that data obtained in an authorized study is considered confidential and will not be subject to subpoena in any potential legal proceedings.

Once the application packet is approved, MDPH will begin contacting parents to arrange interviews. The MDPH must obtain written consent from each parent prior to conducting any in-person interviews.

The study may also require the use of various medical records, such as hospital records data released after written consent has been granted. Written consent will be obtained prior to obtaining individual medical records from the physician and/or hospitals named in the consent form.

14. Q. Who should I contact for more information, or if I want to obtain a copy of the report *Evaluation of Childhood Cancer Incidence in Sandwich, MA, 1995 – 2005*?

- A. The full report is available on the MDPH website at <http://www.mass.gov/dph/ceh>. Staff in the Community Assessment Program can be reached at:

Phone: (617) 624-5757

Fax: (617) 624-5777