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Evaluation of Cancer Incidence in the Old Onset Road Neighborhood of Wareham, MA

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Center for
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I. Introduction

In the fall of 2002, a resident of Wareham contacted the Center for Environmental Health (CEH) at the Massachusetts Department of Public Health (MDPH) regarding concerns over a suspected increased incidence of cancer in the Old Onset Road neighborhood of the town (see Figure 1). Specifically, the resident expressed concerns over cancer diagnoses among individuals living in this area of Wareham and whether the pattern of cancer may be atypical or possibly be related to a common environmental factor. Of note were concerns related to a nearby cranberry bog. In response to this request, the CEH's Community Assessment Program (CAP) reviewed the most recent available cancer incidence data from the Massachusetts Cancer Registry (MCR) for the Old Onset Road neighborhood.

II. Methods

The MCR, a division within the MDPH Center for Health Information, Statistics, Research and Evaluation, is a population based surveillance system that has been monitoring cancer incidence in the Commonwealth since 1982. All new diagnoses of cancer among Massachusetts residents are required by law to be reported to the MCR within six months of the date of diagnosis (M.G.L. c.111. s 111b). This information is kept in a confidential database. To address concerns regarding cancer incidence, CAP staff reviewed the MCR data files to both confirm cancer diagnoses reported among residents of the Old Onset Road neighborhood as well as to determine whether an atypical pattern of cancer may be occurring in this area of Wareham (see Figure 1).

At the time of these analyses, the 20-year period from 1982-2001 constitutes the time period for which the most complete and recent cancer incidence data are available from the MCR. However, since the MCR is a continual surveillance system for cancer, reports of individuals in Wareham diagnosed with cancer in 2002 and 2003 were also reviewed.[1] (Case-specific information for reports of diagnoses in 2004 and 2005 is not yet available for review.) An evaluation of the geographic pattern of cancer was also conducted to determine whether any specific cancer type appeared to be concentrated within the Old Onset Road area of Wareham. Place of residence at the time of diagnosis was mapped for all individuals diagnosed with cancer

[1] The data summarized here were drawn from data entered on MCR computer files before March 21, 2005.

in this area to assess any possible geographic concentration or "clustering" of cases. Because cancer is one word that describes many different diseases, the geographic distribution of each individual cancer type was evaluated separately to determine whether an atypical pattern of any one type was occurring. (For confidentiality reasons, maps of the location of individuals diagnosed with cancer cannot be provided in this report.)

III. Cancer Incidence in the Old Onset Road Neighborhood

For this evaluation, we reviewed the pattern of cancer diagnoses among residents on Old Onset Road and nearby streets in the area, including Gibbs Ball Park Road, Aunt Hannah's Lane, Bertino Street, Midway Street, Doherty Street, the section of Onset Avenue that falls in this area, Dusty Lane, Old Town Road, Baptiste Avenue, Roderick Avenue, Trade Winds Drive, Fresh Meadow Drive, Frederick Gomez Way, and Baker's Island Road (see Figure 1). For the purposes of this report, these streets (including Old Onset Road) shall represent the "Old Onset Road neighborhood."

Between 1982 and 2003, a total of 27 cancer diagnoses were reported to the MCR for residents of the Old Onset Road neighborhood. Ten different types of cancer were diagnosed among residents, indicating the occurrence of many different diseases. The most commonly reported diagnoses included cancers of the lung and bronchus, prostate, colon/rectum, and breast. Together, these cancer types represented two-thirds (n = 18) of the cancer diagnoses among residents in this area. These are the four most common types of cancer diagnosed among men and women in Massachusetts and this pattern of cancer appears to be consistent with national and statewide trends in cancer incidence. There were also several other cancer types diagnosed among residents of this area of Wareham over the 22-year period reviewed, including cancers of the brain and central nervous system, testes, and ureter as well as non-Hodgkin's lymphoma (NHL) and some more rare types of cancer. In addition, two individuals were diagnosed with unknown cancer types. The years of diagnosis for individuals in this area varied throughout the 22 years reviewed. However, approximately 78% of the diagnoses (n = 21) occurred since 1994, suggesting that the overall incidence of cancer among residents of this area has increased over time since 1982 (see Figure 2). There are several possible reasons for this. First, the observed trend may be the result of improvements in cancer diagnosing and/or reporting over time or

increased education and awareness about or access to methods for early detection (e.g., cancer screening). Second, the population may have increased over time in this area. We would expect to observe more cancer diagnoses in areas of higher population density compared to areas of lower population density. Finally, the increase in diagnoses may reflect the aging of the population in the neighborhood. As discussed below, a person's risk of developing most cancers increases with age. Expected numbers of diagnoses and cancer incidence rates cannot be calculated for small geographic areas such as neighborhoods because accurate age group and gender specific population data are not available. However, as described below, case-specific information, including place of residence and cancer type, for individuals diagnosed with cancer in this area of Wareham was evaluated to determine whether any other trends exist.

Based on our review of place of residence for individuals diagnosed with cancer, there were no specific patterns or geographic concentrations of any one cancer type (particularly those that are less common) within this neighborhood that would suggest a common factor (environmental or non-environmental) is related to these diagnoses. An evaluation of cancer patterns in proximity to the cranberry bog did not suggest that exposures to the bog were likely to have played a major role in overall cancer occurrence in the Old Onset Road neighborhood. The distribution of diagnoses seemed to coincide closely with the pattern of population density in this area.

The majority of cancer types diagnosed among residents of the Old Onset Road area of Wareham are predominantly associated with non-environmental factors such as family history, smoking, diet, and other lifestyle behaviors. Because the MCR collects some information related to risk factors (e.g., smoking history) for individuals diagnosed with cancer, these data were reviewed to better characterize the incidence patterns of cancer in this area of Wareham. This included a review of age at diagnosis, gender, smoking history, and occupation.

Age is an important risk factor for many cancers. Different cancers occur with different frequencies among the various age groups. However, most cancer types are diagnosed more frequently in populations age 50 and older. Review of information regarding age and gender indicates that the incidence of cancer in this area is consistent with established prevalence patterns of disease in the general population. Slightly over half of the individuals diagnosed with cancer in this neighborhood were male (n = 15). The average age of diagnosis for individuals in

the Old Onset Road area was 63 years (median age = 64 years). Ninety-three percent (n = 25) of those diagnosed with cancer were older than age 50 at the time of diagnosis.

As mentioned, cigarette smoking is an important risk factor in the development of several cancer types, including cancers of the lung and bronchus and colon/rectum. A review of information regarding smoking history for the 12 individuals diagnosed with a smoking-related cancer in this area revealed that 50% (n = 6) reported being current or former smokers at the time of diagnosis, one was a non-smoker, and smoking history was unknown for 42% (n = 5). Therefore, it is likely that smoking played some role in the development of cancer among some residents of the Old Onset Road neighborhood; however, because smoking history was unknown for some individuals, the extent of this role overall is not clear.

Finally, some occupational exposures, such as jobs involving contact with chemicals, have also been associated with an increased risk for developing certain types of cancer. While the MCR data available for occupation are limited (i.e., the occupation is often listed too generally as the name of a business or is listed as "retired"), a review of occupation as reported to the MCR was conducted. Review of this information showed that two individuals in this area of Wareham worked in jobs where exposures that could be related to an increased risk for developing their cancer may have been possible. None of the information available for any other residents diagnosed with cancer suggested that exposures at work may have been related to their development of cancer. It is probably also important to mention that the information reported to the MCR is based on occupation at the time of diagnosis and therefore potential exposures associated with past occupations cannot be determined. Occupation was reported as retired, at home, or unknown for 26% of the individuals diagnosed with cancer in this area.

Although CAP staff reviewed the MCR data for cancer diagnoses in this area of Wareham through 2003, it is possible that some residents of this neighborhood with cancer may not be included in the MCR files or in the data evaluated in this report (but this is not likely to represent appreciable differences in the overall results of this evaluation). For example, some residents may have been diagnosed before 1982 when the MCR began collecting information on individuals in the state diagnosed with cancer. It is also possible that some individuals resided at or reported an address other than the Old Onset Road neighborhood at the time of their diagnosis

(e.g., a P.O. Box). For some residents whose address information from the MCR was incomplete (i.e., did not include specific street numbers), efforts were made to research those cases using telephone directories and motor vehicle registry records; however, in two instances, it was not possible to determine with certainty whether the individuals resided in the Old Onset Road neighborhood at the time of diagnosis.

IV. Discussion and Conclusions

When interpreting the information presented in this report, it is important to keep in mind that cancer is a common disease. The American Cancer Society (ACS) estimates that one out of every three Americans will develop cancer during his or her lifetime. Over the past forty years, the rise in the number of cancer cases generally reflects the increase in the population, particularly in the older age groups. The most commonly diagnosed cancers for adult males include prostate cancer, lung and bronchus cancer, and colorectal cancer. Breast, lung and bronchus, and colorectal cancers are the most common cancer types diagnosed among women (ACS 2005). For this reason, it was not surprising to observe that two-thirds of the individuals diagnosed with cancer who were residents of the Old Onset Road neighborhood were diagnosed with the cancer types that are frequently diagnosed in the U.S. population.

Understanding that cancer is not one disease, but a group of diseases is also very important. Research has shown that there are more than 100 different types of cancer, each with different causative (or risk) factors. In addition, cancers of a certain tissue type in one organ may have a number of causes. Cancer may also be caused by one or several factors acting over time. For example, tobacco use has been linked to lung, bladder, and kidney cancers. Other factors related to cancer may include lack of crude fiber in the diet, high fat consumption, alcohol abuse, and reproductive history. Heredity, or family history, is an important risk factor for several cancers. To a lesser extent, some occupational exposures, such as jobs involving contact with asbestos, have been shown to be carcinogenic (cancer causing). Environmental contaminants have also been associated with certain types of cancer.

According to the American Cancer Society statistics, cancer is the second leading cause of death in Massachusetts and the United States. Not only will one out of three people develop cancer in their lifetime, but also this tragedy will affect three out of every four families. For this reason,

cancers often appear to occur in "clusters," and it is understandable that someone may perceive that there are an unusually high number of cancer cases in their surrounding neighborhoods or towns. Upon close examination, many of these "clusters" are not unusual increases, as first thought, but are related to such factors as local population density, variations in reporting or chance fluctuations in occurrence. In other instances, the "cluster" in question includes a high concentration of individuals who possess related behaviors or risk factors for cancer. Some, however, are unusual; that is, they represent a true excess of cancer in a workplace, a community, or among a subgroup of people. A suspected cluster is more likely to be a true cancer cluster if it involves a large number of cases of one type of cancer diagnosed in a relatively short time period rather than several different types diagnosed over a long period of time (i.e., 20 years), a rare type of cancer rather than common types, and/or a large number of cases diagnosed among individuals in age groups not usually affected by that cancer. These types of clusters may warrant further public health investigation.

Although 27 residents of the Old Onset Road neighborhood were diagnosed with cancer since 1982, a number of different cancer types were diagnosed over the 22-year time period reviewed. The information reviewed shows that nearly 70% of these residents were diagnosed with one of the four most common types of cancer. It is important to note that non-environmental risk factors are most strongly associated with these cancer types. While some more rare cancer types were observed, the residential proximity of individuals diagnosed with these cancers did not display an unusual pattern.

As mentioned, most cancers diagnosed among these residents were very common types of cancer diagnosed among men and women in Massachusetts and the United States. In addition, no atypical patterns with respect to place of residence or diagnoses over time emerged that would suggest a common factor (either environmental or non-environmental) is related to the overall occurrence of cancer in this area of Wareham.

V. Recommendations

Based on the information reviewed in this report, no further evaluation of cancer in the Old Onset Road neighborhood of Wareham is recommended at this time. In order to provide a better understanding of some of the more common cancer types diagnosed among residents of the Old

Onset Road neighborhood in Wareham, additional information related to risk factors for their development is attached (see Attachment A).

VI. References

American Cancer Society. 2005. Cancer Facts & Figures 2005. Atlanta, GA: American Cancer Society, Inc.

ATTACHMENT A

Risk Factor Information for Selected Cancer Types