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Investigating Cancer in Your Community

A Colorado Department of Public Health and Environment

Fact Sheet

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People often have questions about cancer in their neighborhoods. The following fact sheet addresses some general questions often raised by concerned communities.

WHAT IS A CANCER CLUSTER?

A cancer cluster is a greater than expected number of people diagnosed with cancer during a limited time period in a specific geographic area. People may have concerns about cancer clusters when they learn that friends, family, neighbors or co-workers are diagnosed with cancer. Cancer clusters can also be found by examining data from cancer registries which record information on all new cancer cases.

HOW ARE CANCER CLUSTERS INVESTIGATED?

Once a suspected cancer cluster is identified, it must be carefully evaluated to see if it is real. Cancer is a very common disease and becomes increasingly common in older age groups. One out of every three people is expected to be diagnosed with cancer sometime during his or her lifetime. To see if a cluster is real, one must ask, "Is the number of cancers that occurred in the population, in the defined time period, greater than would normally be expected?" To answer this question, the number of cancers that occurred in this community must be compared to the number expected.

WHAT INFORMATION IS NEEDED?

Several factors must be considered when determining if an excess of cancers exists.

1. Case Confirmation: Each reported cancer case in the community must be confirmed. This requires determining where the tumor is located in the body, whether the tumor is malignant, the tissue type, and when the cancer was first diagnosed. In Colorado, cancer is routinely reported to a state tumor

registry called the Colorado Central Cancer Registry (CCCR). CCCR staff monitor medical records for each cancer patient to confirm the accuracy and completeness of the reports. All patient, physician and hospital information is maintained as privileged and confidential, as required by state law. Information reported to the registry also includes the age, sex, and race/ethnicity of each person diagnosed and residence at time of diagnosis.



2. Type of Cancer: Although we use the term "cancer," we really are talking about many diseases, or cancers, which are different from each other. When we investigate a potential cancer cluster, it is not usually sensible to group the cancers together as one disease. Therefore, it is important to consider the number of cases for each type of cancer. Different types of cancer are expected to occur at different rates. Different life-styles and environmental factors (for example, cigarette smoking, occupation, diet, alcohol use, place of residence) are associated with specific cancer types. Therefore, each type of cancer must be studied individually. If, for example, breast, colon, and lung cancers are reported in a community, each type must be evaluated separately. No single factor has been found to cause all of these cancers.

3. Study Population: The study population must be carefully defined by age and sex for each year studied. The study area used is

often a census tract, a specific geographic area defined by the U.S. Census Bureau. Population data is readily available for each census tract, including information on age, sex, race and ethnicity of the area being studied. If the census tract is not a good match for the community being investigated, further work must be done by the investigator to characterize the study population.

HOW IS THE INFORMATION ANALYZED?

Investigations of potential cancer clusters typically compare the number of observed cancer cases compiled from CCCR records for the community being studied, to the number of cases that would be expected based on other local, state or national cancer rates for the same period. A ratio, called an observed/expected ratio (O/E ratio) is calculated by dividing the number of cancers observed in the study area by the number of expected cases. Statistical testing determines if the number of cancer cases in the community is elevated. Ratios are examined separately for men and women and for the specific cancer types being studied. If the O/E ratio is statistically elevated, a potential cancer cluster has been found and further investigation may be needed to understand the causative factors.

WHAT ARE IMPORTANT CONSIDERATIONS IN EVALUATING A CANCER CLUSTER IN MY NEIGHBORHOOD?

Not all factors that contribute to cancer can be easily investigated. Information that may be important to an investigation may not be available in the registry; because it may not have been reported in a patient's medical record. Cancer has a long latency period (the lag time between when exposure occurs and cancer is diagnosed). The study population may experience many changes, such as residents moving in and out of the community. This makes it difficult to detect cancer clusters or to determine when a cancer cluster is real.

The fact that cancer is so common means that many apparent cancer clusters may occur solely due to chance.

The following examples highlight some of these important considerations:

- A factory employee wants to know if the number of lung cancers among his or her fellow workers is unusual. In this instance, not only do the cases have to be confirmed and the study population defined, but smoking rates must be investigated because smoking causes lung cancer. Do the factory workers smoke more than the general population?
- Twenty-five years ago, a trade union had registered 600 workers in a metropolitan area. Recently, research personnel reviewed the death records of these people. Although approximately six lung cancer deaths were expected, 40 had occurred. The statistically higher rate indicated a need to study possible environmental causes.
- A town mayor reports that ten cancers occurred in two years on two adjacent street. This may not be unusual if three cases are lung cancer, three are cervical, and four are breast cancer. Even though lung, cervical, and breast cancers all occurred, these are all common cancers which are associated with different factors.

For additional information on the issues covered in this fact sheet, please contact:

Jane Mitchell

phone: (303) 692-2644

Disease Control and Environmental
Epidemiology Division
Colorado Department of
Public Health and Environment
4300 Cherry Creek Drive South
Denver, CO 80222-1530

Thank you to the Pennsylvania Department of Health and the Ontario Cancer Treatment and Research Foundation for providing much of the information for this fact sheet.