



Colorado Department
of Public Health
and Environment

Investigating Cancer in Communities

People often have questions about cancer in their neighborhoods. The following information 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 geographical area. Cancer clusters may be reported when people learn that friends, family, neighbors or co-workers are diagnosed with cancer.

After close inspection, most reported clusters are revealed to be the coincidental occurrence of a variety of cancers among people of mixed ages, sex and occupation. The number of each different type of cancer reported is often typical for the population group in which they are diagnosed. Sometimes cancer does, however, appear in groupings. An assortment of reasons may explain these groupings. A cluster may be related to important public health factors which may place people at greater risk and warrant a more in-depth investigation.

Where Should I Report a Suspected Cluster? In Colorado, suspected cancer clusters should be reported to the Colorado Department of Public Health and Environment's Colorado Central Cancer Registry (CCCR). The State Health Department has the information and expertise to investigate suspected clusters. 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 kept private 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 the time of diagnosis.

How is a Cancer Cluster Investigated? Once a suspected cancer cluster is identified, it must be carefully evaluated to see if it is a real cluster. Cancer is a very common group of diseases and becomes increasingly common in older age groups. One out of every three people is expected to be diagnosed with cancer at some time during his or her lifetime. To see if a cluster is real, investigators must ask, "Is the number of cancers that were diagnosed in a given population, in the defined time period, greater than would be normally expected?" Several factors must be considered:

- **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, what tissue type, and when the cancer was first diagnosed.
- **Type of Cancer:** Since cancer is actually many different diseases, it is not sufficient to group all cancers together. Different types of cancer are expected to occur at different rates. Different lifestyles and environmental factors (for example, cigarette smoking, occupation, diet, alcohol use and place of residence) are associated with specific cancer types. Therefore, it is important to consider the number of each type of cancer. 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.

- **Study Population:** The study population must be defined by geographic boundaries, such as zip codes or U.S. Census Bureau-defined census tracts or block groups, because population counts by age, sex and race/ethnicity are available for these areas. These population counts are essential to estimating the expected number of cancers in an area because incidence rates of cancer are different for men and women of varying race/ethnicity at different ages.

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 (a cancer rate is the number of new cancer cases per year per 100,000 people). The expected number of cases is estimated by multiplying the population of each sex and age group in the community being studied by the sex and age-specific cancer rates in the comparison population. The best comparison population will have case reporting and similar demographic characteristics for the same time period as the community under investigation.

A ratio, called an observed/expected (O/E) ratio is calculated by dividing the number of cancers diagnosed in the study area by the number of expected cases. Statistical testing determines if the number of cancer cases in the community is significantly 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.

What Other Important Factors Should Be Considered in a Cluster Investigation?

A number of factors should be kept in mind that may make detecting or confirming a cluster difficult:

- Not all factors that contribute to cancer can be easily investigated because the information may not be available from the Cancer Registry or the patient's medical record.
- Most cancers appear to have long and differing latency periods. Long latency can make it difficult to judge if a group of cancer cases are temporally related and also difficult to determine the appropriate time period for inclusions of cases in the investigation.
- The study population may change over time, including in- and out-migration and socioeconomic factors.
- Since cancer is so common, many apparent clusters may occur solely by chance.

Contact the Colorado Department of Public Health and Environment for More Information:

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