CANCER CLUSTER RESPONSE PROTOCOL

The protocol described below parallels the cluster investigation guidelines published by the Centers for Disease Control and Prevention (CDC) in the September 27, 2013 edition of the *Recommendations and Reports* series of Morbidity and Mortality Weekly Report (MMWR), which is available online at http://www.cdc.gov/mmwr/index.html. The protocol outlines three major steps: Initial Response, Standardized Incidence Ratios, and In-Depth Study, with decisions following each step. Also included is a brief description of Local Health Officer roles in cancer cluster inquiries.

Responses to inquiries are designed to be:

- Timely, courteous, empathetic;
- Efficient at triaging and communication;
- Informational to citizens and their families, co-workers, neighbors, health care providers, and public officials; and
- Helpful in facilitating any necessary future communication through maintenance of electronic documentation.

Cancer Surveillance Unit (CSU) staff will coordinate with other New Jersey Department of Health (NJDOH) Programs as needed. Community and neighborhood cancer cluster inquiries will be addressed differently than occupational and workplace cancer cluster inquiries, as described below.

Community or Neighborhood Cancer Cluster Inquiries

I. Initial Contact and Response to Inquiries Regarding Communities or Neighborhoods

Listen to determine: (a) personal involvement with the people with cancer; (b) the degree of concern; and (c) level of knowledge about cancer and cancer incidence.

Record specific information, including number and types of cancer and when diagnosed, gender, ages at diagnosis, population characteristics, and any hypothesized causal factors. A standard Cluster Inquiry (CIN) form is completed and information is entered into a database.

Provide information on cancer: A customized letter is sent to the person(s) inquiring, with a copy to the Local Health Officer. The written response includes a summary of the telephone conversation, a brief summary of current scientific understanding of pertinent cancers and/or exposures, excerpts from or copies of public education materials, referrals for additional information including cancer prevention and control, an invitation to contact us again with more information or questions, and a request to complete a feedback form addressing the caller's satisfaction with our response.

Among the key educational enclosures used are:

- Cancer cluster inquiry fact sheets (general and occupational, if pertinent);
- Excerpts from the American Cancer Society's current *Cancer Facts and Figures* and/or excerpts from the National Cancer Institute's *PDQ* database;
- Cancer risk factors fact sheet; links to web sites with more information about cancer from NJDOH (http://www.nj.gov/health/ces/public/surveillance-unit/) and from CDC (http://www.cdc.gov/cancer/);
- Other excerpts, fact sheets, news articles, or papers on specific types of cancer or exposures as indicated and available.

The response to some inquiries are concluded with the above activities, however additional activities may be undertaken, including:

Case characterization and verification: If the initial information suggests an unusual pattern regarding number and types of cancer, gender, or ages at diagnosis, additional information may be collected from the caller on each case, which may include:

- Cancer type (site),
- Date of diagnosis (approximate),
- Sex/Gender,
- Age at diagnosis (approximate),
- Address of residency at diagnosis and residential history,
- Occupational history,
- Smoking status.

Review of cancer data from the New Jersey State Cancer Registry (NJSCR): If indicated, staff may also review county and municipal level cancer data from the NJSCR to look for any unusual patterns. The NJSCR is a population-based registry that collects data on all cancer cases diagnosed and/or treated in New Jersey since October 1, 1978. More information about the NJSCR is available online at http://www.nj.gov/health/ces/reporting-entities/njscr.shtml.

Contact Local/State Officials: If indicated, Local Health Officers and/or other NJDOH programs or State agencies may be contacted in order to evaluate related information such as unusual or possibly hazardous conditions.

Additional information from the above activities is usually included in the customized letter. The results of this first step are used to determine if a formal Standardized Incidence Ratio (SIR) analysis should be conducted.

II. Formal Standardized Incidence Ratio (SIR) Analyses

SIR analyses are rarely carried out and are only conducted under the following circumstances:

- There are **at least** 5 cases of one type or related types of an uncommon adult cancer, OR **at least** 3 cases of one type or related types of childhood cancers;
- There is a plausible reason to suspect more than normal fluctuation of cases;
- The latency issues are potentially consistent with a common factor (ages, dates of diagnoses and residency); OR
- Community concern is high.

When NJDOH conducts SIR analyses:

- Observed numbers of cases are those confirmed via NJSCR;
- Addresses are checked for accuracy if feasible;
- Expected numbers of cases are derived from statewide age-specific rates from the NJSCR;
- Appropriate population data are used to calculate numbers of expected cases for comparison with observed cases;
- SIRs are calculated separately for each gender OR combined where appropriate;
- Time trends are observed;
- 95% confidence intervals (CIs) are calculated.

A formal SIR report to the requestor may be prepared which may include:

- Tables with observed and expected numbers of cases, SIRs and 95% CIs;
- Interpretation of SIR analysis results, with comments on observed trend or lack of trend, when applicable;
- Major risk factors for the cancers of concern being investigated and relevant educational materials;

All reports are sent or copied to the Local Health Officer. Staff provide assistance in communicating results of reports to the public. Reports with positive outcome(s) in analysis are followed up with a phone call to the Local Health Officer.

Among the possible outcomes of SIR analyses are:

- No further actions are indicated.
- Public education and outreach are conducted, in concert with the Local Health Officer.
- Follow-up surveillance for communities with high SIRs, but which do not meet the criteria for further investigation. Follow-up surveillance will be undertaken every two to three years, with an assessment of the need to continue at the completion of the follow up based on both analysis results and the level of community concern.

Considerations

It should be emphasized that there are many investigations where SIR analysis shows an increase in cancer cases above expected counts, but these findings could be due to chance alone. In these circumstances, cancer trend monitoring over some extended time-period is implemented to determine if the variability of future fluctuations is consistent with a chance event.

III. In-Depth Study

Evaluation of the need for and feasibility of an in-depth study may be conducted in consultation with other NJDOH officials and experts or external agencies, where appropriate. All activities in this step are carried out in collaboration with community, environmental and other partners. There are many things that need to be considered before making a recommendation to proceed with a feasibility assessment, which could include, but are not limited to, the following:

- Do a sufficient number of cases exist to adequately power an epidemiologic study?
- Are calculated SIRs statistically significant and appreciably elevated?

- Is there a known or suspected local environmental hazard with an identified completed exposure pathway from source to residents/people, and is there evidence in the scientific literature that this hazard may be associated with the development of cancer?

Case-control or other in-depth epidemiologic studies are undertaken only in the event of all the following:

- Sufficient number of cases / sufficient sample size;
- Detailed demographic data for the majority of cases, if not all cases;
- A biologically plausible hypothesis with documented complete exposure pathways;
- A specific geographic study area that can easily be delineated;
- Specific timeframes of interest available for relevant exposures and cancer diagnoses;
- Latency characteristics are consistent with the timeframes of exposures and diagnoses of cancers;
- A consistent "case" definition can be set;
- Sufficient resources;
- Institutional Review Board (IRB) approval; and
- Departmental approval.

Occupational or Workplace Cancer Cluster Inquiries

The CDC guidelines used for addressing suspected community or neighborhood cancer clusters do not address workplace cancer clusters or those related to medical treatment (e.g., cancers associated with pharmaceuticals). Workplace or occupational clusters and medically related clusters each present unique sets of circumstances, have unique and clearly defined populations at risk, and generally call for specific investigative methods, agencies, and partnerships (1,2,3). The type of extensive resources and work required to provide detailed, in-depth responses to workplace or occupational cancer cluster concerns falls outside of the CSU's present capabilities and official purview.

When employees or others contact the CSU directly with concerns about occupational health hazards that may be related to the occurrence of occupational and workplace cancers, the CSU follows the initial response framework used to respond to community and neighborhood cancer concerns. Written responses are provided for all inquiries regarding occupational and workplace cancers with educational activities and the provision of referrals to pertinent contacts (e.g., the Local Health Officer and state or federal occupational health and safety agencies) for further assistance. The CSU does not conduct analyses or studies in these instances.

When a public sector employee files a complaint about workplace health hazards with the NJDOH Public Employees Occupational Safety and Health (PEOSH) Unit that mentions "cancer", the CSU is automatically notified to assist in addressing these cancer concerns. For a private sector employee in New Jersey who files a similar complaint with the United States Occupational Safety and Health Administration (OSHA), the CSU is also contacted to assist with addressing any stated cancer concerns. Complaints to both OSHA and PEOSH are kept confidential and correspondence are not copied to the Local Health Officer.

The Role of Local Health Officers in Cancer Cluster Inquiries

The Local Health Officer may assist with:

- Initial response;
- Evaluation of environmental and other factors contributing to observations, including characteristics of population (age, diet, smoking, SES, etc.);
- Evaluation of sensitivities, history of local population and key informants;
- Public education;
- Coordination of local educational events (if any);
- Communication with the public, (if necessary);
- Communication with NJDOH and other agencies, as needed.

References

1. Brown AM. Investigating clusters in the workplace and beyond. Occup Med (Lond) 1999;49:443-7.
2. Centers for Disease Control and Prevention. Investigating suspected cancer clusters and responding to community concerns – Guidelines from CDC and the Council of State and Territorial Epidemiologists. MMWR 2013;62(No.8):1-28.
3. National Institute for Occupational Safety and Health. Occupational cancer. Washington, DC: National Institute for Occupational Safety and Health; 2010. Available at http://www.cdc.gov/niosh/topics/cancer.