



Illinois Department of Public Health ▪ Pat Quinn, Governor ▪ Damon T. Arnold, M.D., M.P.H., Director

Crestwood (Cook County) Cancer Assessment – Fact Sheet

March 5, 2010

Cancer – some general facts

Cancer is a common disease, sometimes more common than many people realize. In the U.S., one in two men has a lifetime risk of developing cancer. For women, the lifetime risk is one in three. The number of people with cancer is increasing in most communities because more people are living to the ages of greatest cancer occurrence.

Many people could reduce their chances of developing or dying from cancer by adopting a healthier lifestyle and by visiting their doctor regularly for cancer-related checkups. Screening examinations, conducted regularly by a health care professional, can result in the detection of cancers of the breast, tongue, mouth, colon, rectum, cervix, prostate, testis, and melanomas at earlier stages, when treatment is more likely to be successful. More than half of all new cancer cases occur in the nine screening-accessible cancer sites listed above.

The causes of most cancers are not well understood. Current knowledge suggests that many cancers are influenced by a combination of factors, including heredity, environment, and behaviors related to how we live, called lifestyle behaviors. Lifestyle behaviors that increase cancer risk include cigarette smoking, alcohol use, diet, obesity, and lack of physical activity, and they account for the majority of all cancer deaths in the United States. Environmental and

occupational exposures to cancer-causing chemicals, ionizing radiation, and other agents produced by humans also significantly contribute to cancer risk. A recent World Health Organization report (2006) concluded that 16 percent of cancers in men (other than lung cancers) and 13 percent in women were attributable to environmental and occupational exposures in developed countries.

Cancer correlation versus cause

A correlation between an exposure and cancer does not necessarily mean that the exposure caused the disease. Establishing the likelihood of a causative relationship between a chemical and cancer requires multiple studies and multiple lines of evidence that consistently point to the link between the exposure and cancer.

Cancer has multiple causes and factors, and takes many years to occur

It is a common perception that cancer is a single disease. In fact, cancer is actually many different diseases, each with differing rates of occurrence, risks, causes, and chances of survival. Not all persons develop the same disease for the same reason (i.e., no one factor determines whether an individual will develop a disease). It is the interaction of many factors that produce disease (e.g., for cancer this could be genetics, immunity, diet, occupation, hormones, viruses, socioeconomic, lifestyle, age, or physical environment).

Also, cancer does not develop immediately after contact with a cancer-causing agent (carcinogen). The time between the exposure to a carcinogen and medical diagnosis of cancer, called latency period, is often 10 to 20 years. This makes it very difficult to pinpoint what

caused the cancer. Cancers are usually related to long-term lifestyle behaviors (e.g., smoking) or significant exposure to carcinogens for many years.

What did the Illinois Department of Public Health (IDPH) assessment find?

IDPH reviewed cancer data for the Village of Crestwood because of the potential cancer risk associated with exposure to chemicals found in the Crestwood drinking water. This included vinyl chloride, a known carcinogen that has been specifically associated with angiosarcoma of the liver and liver cancer, and perchloroethylene (PCE, or tetrachloroethylene) and its breakdown products, which may be related to a number of cancers.

There were no cases of angiosarcoma of the liver found in Crestwood or in any areas adjacent to Crestwood during the 13 year period between 1994 and 2006. During that time period, 14 cases of liver cancer were reported in Crestwood. However, this number of cases was not statistically different from the number of cases that would be expected for Crestwood. In other words, this is the number of liver cancers we would expect to see in a population this size.

For other cancers, several statistically significant elevations have been identified. Lung cancer was found to be significantly higher in both males and in females. Colorectal and kidney cancers were significantly higher among males. Gastrointestinal (GI) cancers as a combined group, which include oral cavity and pharynx, esophagus, stomach, and colorectal cancers, were also significantly elevated among males when assessed together. There were no significant elevations observed for these cancer sites among females. Cancer incidence for any other sites, in any gender or race combinations, was not found to be elevated in Crestwood.

What did the assessment's findings mean?

The negative findings about the two cancers that are known to be specifically associated with vinyl chloride exposure, angiosarcoma of the liver and liver cancer, while seemingly assuring, are not surprising because the association of these cancers with vinyl chloride has never been demonstrated outside an occupational environment. The absence of angiosarcoma of the liver most likely reflected the fact that this cancer is such an extremely rare cancer and that the present assessment, with its relatively small number of cases and resulting low statistical power, would not be expected to find cases in Crestwood. The lack of statistically significant elevations of liver cancer also was expected because liver cancer associated with vinyl chloride exposure has only been observed among workers who had experienced a sustained period of exceedingly high doses of exposures to vinyl chloride. While we are not able to determine what doses of vinyl chloride residents may have received due to its presence in the Crestwood drinking water, we are highly confident that residents' exposures were much smaller than exposures experienced by workers who developed these two cancers.

The significantly higher lung cancer, kidney cancer, colorectal cancer, and overall gastrointestinal (GI) cancer rates were probably related to a number of different risk factors. Lung cancer can be caused by tobacco smoking and exposure to radon, air pollution, and several workplace chemicals. Kidney cancer may be related to smoking, obesity, high blood pressure, family history and job exposure to certain chemicals and organic solvents. GI cancers can be associated with diet, obesity, smoking, alcohol use, family history and hereditary background, and long and high level exposure to certain chemicals. It is unclear whether some of these risk factors were particularly stronger or more common among males than among females in Crestwood. PCE and some of its breakdown products are possible carcinogens for a wide range

of cancer sites and it is possible that their historical presence in the Crestwood drinking water contributed to the increase of these cancers. However, due to various methodological limitations and uncertainties about actual past exposure to these chemicals, this assessment could not establish with confidence that the increases of these cancers were related to the Crestwood water contamination, nor rule out such a possibility. Chance occurrences also could play a role in some or all of these elevations, as every possible cancer site, gender, and race combination was exhaustively examined and compared in the assessment. Unfortunately, as with any studies of suspected cancer clusters that involve multiple comparisons, the assessment could not eliminate chance occurrences.

How was the assessment area defined?

The long-standing practice for conducting a cancer assessment by the Illinois State Cancer Registry has been to use ZIP code(s) to define the assessment area. In the case of Crestwood, however, the city boundary was used because the ZIP code 60445 covers both Crestwood and Midlothian, and including Midlothian in the analysis could significantly ‘dilute’ any exposure effects specific to Crestwood. Identification of cases within the “Crestwood city limits” was challenging and time consuming. Despite the challenge, IDPH was able to identify exact addresses for all of the cases in Crestwood.

Were all cancer cases in Crestwood included for the assessment?

All patients with invasive cancer who were medically diagnosed between 1994 and 2006 that lived in Crestwood at the time of diagnosis were eligible to be registered by the Illinois State Cancer Registry. The cancer registry has maintained 100 percent case completeness for its

registered data statewide during this period, as certified by the North American Association of Central Cancer Registries. All registered cancer cases with verified Crestwood addresses at the time of diagnosis were included in the assessment. As with all cancer assessment studies, this means that persons who moved into Crestwood following exposure to a carcinogen in another region are included as “Crestwood” cases and persons who moved out of Crestwood following exposure to a carcinogen and were diagnosed elsewhere are not included as “Crestwood” cases.

Why can't the assessment prove the cause of my cancer?

Concluding that a particular environmental exposure in a particular area caused cancer amongst the residents based on the analysis of the relative frequency of particular types of cancer in the area compared with background rates is particularly difficult. It can only be done with confidence in a setting in which multiple lines of evidence support the conclusion. This might happen, for instance, in a community with a high rate of lung cancer and mesothelioma and the presence of airborne waste asbestos from a dump. On the other hand, most frequently, these studies are fraught with the uncertainties contained in this evaluation of Crestwood. They therefore can be taken only as one piece of evidence of possible association awaiting a broader picture to emerge from multiple types of data.

Finally, it needs to be remembered that a single epidemiologic study usually cannot enable an individual to know why he/she developed cancer. Many limitations exist that are a part of any cancer assessment study, and the IDPH Crestwood cancer assessment is no exception.

What's the next step?

As we know that certain cancers in this area occurred with more frequency during this period than amongst people in Cook County as a whole, it would be wise for individuals to ask their doctors for advice regarding appropriate screening tests for these cancers. Specifically, certain GI cancers can be screened for and even prevented by early screening. For example, colorectal cancer can be effectively screened by periodic occult blood stool testing and colonoscopy.

Epidemiologists at the Illinois State Cancer Registry will continue to monitor and track cancer cases in Crestwood. Re-assessments of cancer incidence in the area will be conducted in the future to detect changes in cancer incidence and to examine possible effects, if any, from the discontinuation of the contaminated drinking water. Additional studies also could be considered to examine other factors that may explain some of the cancer elevations or distribution patterns in the area.

Where should I call if I have further cancer-related questions?

Dr. Tiefu Shen (phone 217-785-1873; e-mail to: Tiefu.Shen@illinois.gov)

or

Melinda Lehnherr (phone 217-785-1873; e-mail to Melinda.Lehnherr@illinois.gov)