Analysis of Cancer Incidence: Lake Township, Stark County, Ohio

1996 – 2001

Stark County Health Department

May 2005

Executive Summary

Purpose

An analysis was conducted in Lake Township, Stark County, Ohio to determine the incidence rate of cancer from 1996 to 2001. The incidence was then compared to national data in order to determine if there is an elevated incidence of cancer in Lake Township. The analysis was conducted in response to residents' concerns voiced to local media and the local health department about the former Industrial Excess Landfill (IEL), which is located in Lake Township. IEL is no longer in operation and has been declared a Superfund site by the U.S. Environmental Protection Agency.

Methods

Cancer registry data was obtained for Lake Township from the Ohio Cancer Incidence Surveillance System (OCISS) at the Ohio Department of Health (ODH) for the years 1996 to 2001. Age-adjusted incidence rates, the number of expected cases, and Standard Incidence Ratios (SIRs, defined as the ratio of the number of observed to expected cases) were calculated. SIRs with values less than 1.0 indicate that fewer cases were observed than would be expected. SIRs with values greater than 1.0 indicate that more cases were observed than would be expected. SIR values were assessed for statistical significance by examining 95% confidence intervals. An SIR with a 95% confidence interval that does not contain the null value (1.0) is considered to be statistically significant.

Results

A total of 547 new cases of cancer were diagnosed among residents of Lake Township from 1996 to 2001. Of those 547 cases, 49.0% were among males and 51.0% were among females. The two most common sites/types of cancer were prostate (57 cases, accounting for 21.3% of all cases among males) and breast (121 cases, accounting for 43.4% of all cases among females).

Conclusions

No statistically significant elevated cancer incidence was detected in Lake Township from 1996 – 2001. The SIRs for all sites/types combined were less than 1.0 for both males and females and were statistically significant. While more cases were observed than would be expected for several individual sites/types by gender, none of the SIRs were found to be statistically significant for these sites/types. Based on the data available, the incidence of cancer in Lake Township from 1996 – 2001 is not elevated and is in fact significantly lower than would be expected for both genders.

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Introduction

The malfunction of genetic controls can result in uncontrolled cell growth and the spread of abnormal cells in tissues throughout the body (Brownson, Reif, Alavanja, and Bal, 1998). This uncontrolled cell growth and the spread of these abnormal cells is the basic mechanism of cancer. Cancer is not just one disease, but rather a group of more than one-hundred diseases, generally classified based on the location and type of abnormal cell growth present (Ohio Department of Health [ODH], 2004). The most serious danger of a cancer is the risk that the cancer will spread or metastasize to other areas of the body, including the vital organs, preventing them from functioning properly (Brownson et al, 1998).

Cancer is the second leading cause of death in adult Ohioans and Americans as a whole, behind only heart disease (ODH, 2004; Brownson et al, 1998). It is estimated that American men have a 1 in 2 lifetime risk of developing some form of cancer. Women in America have a 1 in 3 lifetime risk of developing cancer (ODH, 2004). The risk of developing cancer increases with age. Patients aged 55 and older account for 76% of all new cases of cancer (ODH, 2004). Despite these discouraging facts, health professionals are encouraged by the fact that overall cancer incidence rates have been declining and survival rates have been improving over the past few years (Jemal et al, 2004).

Cancer is caused by the interaction of several different risk factors in ways that are often not clearly understood (National Cancer Institute [NCI], 2004). In most cases, it is nearly impossible to identify the specific causes of a case of cancer. Different cases of the same type of cancer can manifest in the same

way, regardless of their etiology, which makes it difficult to determine whether or not several cases of the same type of cancer were caused by the same combination of risk factors (Heath, 1996). Varying, but generally lengthy, latent periods also make it difficult to pinpoint the cause of a case of cancer (Brownson et al, 1998). Long latent periods can impede the identification of all of a patient's risk factors and potential exposures.

An analysis of the burden of cancer in Lake Township, Stark County, Ohio was conducted in order to determine if the incidence of cancer in residents of the township is higher than would be expected when compared to a similar population group from national cancer incidence data. Residents have voiced concerns in the past, to both the local media and state and local public health agencies, over what they perceive to be a higher than normal rate of cancer incidence in Lake Township. Some citizens believe that the former Industrial Excess Landfill (IEL) may have contaminated the environment within the township and caused an increase in serious health problems, including cancer.

Environmental health assessments of the area surrounding IEL have been conducted by the U.S. Environmental Protection Agency (U.S. EPA) and the Agency for Toxic Substances and Disease Registry (ATSDR). Assessments of the cancer burden in Lake Township have previously been conducted and no significant elevations of cancer incidence were found. Little environmental contamination has been discovered in the neighborhoods surrounding the closed landfill and no serious effects on the health of residents have been observed. An

additional analysis of cancer incidence was conducted at this time to help address the concerns of the public.

Industrial Excess Landfill

The former Industrial Excess Landfill (IEL) encompasses 30 acres with boundaries completely within Lake Township in Stark County, Ohio. Prior to its conversion to a landfill in 1966, IEL operated as a mining and excavation pit (EPA, 2004, b). From 1966 to 1980, IEL operated as a mixed-waste landfill (EPA, 2004, b). The Stark County Board of Health ordered IEL to stop accepting chemical wastes in 1972 (EPA, 2004, b). During its time in operation as a landfill, IEL accepted approximately 780,000 tons of solid waste and 1,000,000 gallons of liquid waste (EPA, 2004, b). Much of the industrial waste received was from nearby rubber companies in Akron, Ohio (EPA, 2004, b). The most common wastes disposed of at IEL were: flyash, solid and semi-solid latex, oils, flammable and non-flammable solvents, garbage, trash, septic tank waste, and other organic matter with the potential to generate methane gas (EPA, 2004, a). Approximately 80 to 85% of the site was covered with various types of waste at one time (EPA, 2004, a).

In October, 1984, the U.S. Environmental Protection Agency (U.S. EPA) added IEL to the National Priorities List (EPA, 2004, b). The National Priorities List contains hazardous waste sites that are eligible for special funding for investigation and cleanup through the federal Superfund program.

An initial investigation by the U.S. EPA revealed that groundwater had been contaminated by wastes from IEL. Contamination was present onsite and had also spread outside the landfill through a plume of groundwater that extended approximately 1000 feet west of the landfill boundary into nearby residential wells (EPA, 2004, a). Certain metals were also detected above Federal Maximum Contaminant Levels (MCLs) for drinking water in residential wells outside the landfill. In response to this threat to public health, about one-hundred homes near IEL were connected to a municipal water supply, eliminating the need for private wells in the area of the contaminated groundwater plume (EPA, 2004, a).

Ground water has been continually monitored since 1988 and has shown great improvement since that time. In areas outside the landfill boundaries where some contamination had previously been detected, no compounds are now detectable above MCLs for drinking water (EPA, 2004, a). Groundwater in the north-central portion of the landfill still exhibits elevated levels of benzene (EPA, 2004, a). The total number of metals detectable in the groundwater is fewer than was reported in 1988 and the concentrations are lower on average (EPA, 2004, a). Recent environmental assessments have indicated that there is no longer any evidence of a groundwater plume of contamination (EPA, 2004, a).

The air, soil, and groundwater at IEL have also been tested for elevated levels of radiation several times since 1985 (EPA, 2004, a). While measurable amounts of radiation have been detected, the amounts have not exceeded MCLs for drinking water. Levels of radiation in the soil have not been detected above

normal background radiation levels. Radiation has been continually monitored at IEL and has not been detected at levels above standards in place to protect human health (EPA, 2004, a). The U.S. EPA has determined that no cleanup action is necessary relating to radiation.

Because IEL was classified as a Superfund site in 1984, the U.S. EPA was charged with ensuring that an appropriate cleanup plan was developed and implemented for the site. Natural attenuation is being utilized to eliminate the contamination on the IEL property. The process involves planting an appropriate vegetative cover consisting of trees and other plants that work to filter contaminants (EPA, 2004, a). A methane gas venting system was installed, but methane levels have reduced so dramatically that the methane flare must now be manually lit several times a week. Residents whose wells were in danger from the groundwater plume of contamination were connected to a municipal water supply, eliminating their need for private wells. Groundwater and gases will continue to be monitored on a regular basis. A fence has been installed surrounding the property and deed restrictions are in place to ensure that the property is used safely in the future (EPA, 2004, b).

Agency Description

The Stark County Health Department is headquartered in Canton, Ohio and serves all residents of Stark County except for those living within the cities of Alliance, Canton, and Massillon. The mission of the Stark County Health Department is to enable all individuals “to realize their social and individual

responsibilities to promote and protect their health and the health of their community" (Stark County Health Department, 2005). The assessment of cancer incidence in Lake Township was conducted with the assistance staff at the Stark County Health Department, including the Health Commissioner, the Director of Administration and Support Services, and the staff Epidemiologist.

Lake Township is located within Stark County and is served by the Stark County Health Department. The total population of Lake Township is 25,892, 49.7% male and 50.3% female. Racial data indicate that the population of Lake Township is 97.9% white, suggesting that national cancer incidence data for the white population should be used for comparison purposes. The median household income for residents of Lake Township is $57,347 per year (U.S. Census, 2004).

Technical assistance and data was provided by the Ohio Department of Health, Division of Prevention. The Bureau of Health Surveillance, Information, and Operational Support, Community Health Assessment section assisted in gathering the necessary data and provided detailed technical assistance for conducting the cancer assessment. The Ohio Cancer Incidence Surveillance System (the cancer registry system for Ohio) supplied data for Lake Township residents diagnosed with cancer from 1996 to 2001.

Study Design

The cancer assessment was conducted using existing incidence data from the Ohio Cancer Incidence Surveillance System (OCISS), which is maintained by

the Ohio Department of Health. The Ohio Revised Code requires that all physicians who diagnose or treat patients for cancer must report each newly diagnosed case to OCISS (effective January 1, 1992). Basal and squamous cell skin cancer and carcinoma in situ of the cervix are not required to be reported. Reported cases of cancer are housed in the OCISS database at the Ohio Department of Health.

Using a combination of procedures developed by the Ohio Department of Health (ODH) Community Health Assessment program staff and the Stark County Health Department, both the age-adjusted incidence rates and the expected number of cases was calculated for each cancer site/type category. The ODH Community Health Assessment program developed a series of worksheets in Microsoft Excel to allow local health department staff to more easily calculate age-adjusted rates and expected cancer incidence values. Formulas for calculations were built into the worksheets so that local users only need to input their population of interest, incidence rates from a comparison population, and the number of cancer cases observed during the given time frame.

Methods

OCISS data for diagnosis years 1996 – 2001, which was the most current data available at the time of the assessment, was obtained from ODH, following approval by the Institutional Review Board. Due to technical constraints and non-standardized address data, OCISS was unable to provide geo-coded data,

which would have classified cases to the township level. Instead, data could only be extracted at the zip code level. Most of the zip codes that are part of Lake Township also overlap with other townships and cities. Data for all zip codes contained completely or partially in Lake Township was included in the initial data set of 2631 records. Each of the 2631 records was checked individually to determine whether or not the case was a resident of Lake Township. Township of residence was determined by manually searching for each address using geo-coding search engines on the U.S. Census and Stark County Auditor websites. Of the 2631 cases within appropriate zip codes, 547 were determined to be residents of Lake Township.

Cancer incidence data is generally grouped into twenty-four categories, based on site and type of cancer for reporting purposes. OCISS data is coded based on the International Classification of Diseases for Oncology, Third Edition codes. Each of the 547 cases was grouped into one of the twenty-four categories based on the criteria used by the Surveillance, Epidemiology, and End Results (SEER) Program at the National Cancer Institute. Duplicate cases were eliminated at this time. A duplicate was defined as multiple case entries of cancer at the same primary site for the same person. Patients with more than one case of cancer at different primary sites were counted as multiple cases. For example, a patient who was diagnosed with cervical cancer in 1998 and then with breast cancer as a separate primary cancer in 2001, counted as one case of cervical cancer and one case of breast cancer.

Age-adjusted incidence rates were calculated using the 2000 U.S. Standard Age-Adjustment Factor and population data from the 2000 U.S. Census. Because the 2000 U.S. Census estimated the population of Lake Township to be 97.9% white, the SEER cancer incidence rates for whites were used to calculate the expected number of cases.

Standard Incidence Ratios (SIRs), defined as the ratio of the number of observed cases to the number if expected cases, were calculated for both males and females for each site/type. An SIR with a value greater than 1.0 indicates that more cases were observed than would be expected when compared to a similar population. SIR values less than 1.0 indicate that fewer cases were observed than would be expected. SIRs were assessed for statistical significance by examining 95% confidence intervals using the technique described by Bailar and Ederer (1964). SIRs with confidence intervals that do not contain the null value (1.0) are considered to be statistically significant.

Results

A total of 547 cases of cancer were diagnosed in residents of Lake Township from 1996 to 2001. Of these 547 cases, 268 cases were in males (49.0%) and 279 cases were in females (51.0%). The two most common sites/types among males were prostate (57 cases, 21.3% of all male cases) and the lung or bronchus (43 cases, 16.0% of all male cases) (see Appendix A). The two most common sites/types among females were breast (121 cases, 43.4% of

all female cases) and the colon or rectum (32 cases, 11.5% of all female cases) (see Appendix C).

Standard Incidence Ratios (SIRs) were calculated for males and females by site/type. Overall, 360 cases were expected in males, based on national cancer incidence data for a comparable population. 268 cases were diagnosed among males, which was less than would be expected. The resulting SIR for males was 0.7, which was statistically significant (see Appendix A). In females, 332 cases were expected but only 279 cases were observed. The SIR for females was 0.8, which was statistically significant (see Appendix C).

While several sites/types had more cases than were expected, none of the elevations were statistically significant. In males, 4 sites/types (Hodgkin's lymphoma, melanoma of the skin, stomach, and testis) had more observed cases from 1996 to 2001 than were expected. In females, 3 sites/types (breast, cervix, and melanoma of the skin) had SIR values greater than 1.0. Based on an examination of the 95% confidence intervals for these SIRs, however, none of these elevations were statistically significant.

Age-adjusted incidence rates were also calculated for sites/types with greater than five cases for Lake Township, Stark County, and Ohio. Due to the small numbers involved in calculating disease incidence rates for Lake Township, this data may not be as reliable as SIR data (see Appendices E and F). The addition or elimination of relatively few cases can make the dramatic differences in the incidence rates for Lake Township.

Discussion

Based on national cancer incidence data and the population of Lake Township, 360 cases of cancer in males and 332 cases of cancer in females would be expected to be diagnosed from 1996 – 2001. From 1996 to 2001, 268 cases were diagnosed in males and 279 cases were diagnosed in females, fewer cases than were expected for both genders. Because fewer cases were observed than were expected, the SIRs for both males and females were less than 1.0 (0.7 and 0.8 respectively). The 95% confidence intervals for both SIRs do not contain 1.0, indicating that both values are statistically significant (see Appendices B and D). The overall number of cases of cancer in Lake Township from 1996 to 2001 for both genders was significantly less than would be expected based on a comparable national population.

For males, the SIRs for all sites/types combined, non-Hodgkin's lymphoma, and prostate cancers were all less than 1.0 and statistically significant, indicating that fewer cases were observed than would be expected. The SIR for non-Hodgkin's lymphoma was 0.4 and the SIR for prostate cancer was 0.5. Males had an SIR of 0.7 for all sites/types combined. None of the 95% confidence intervals for these 3 categories contained 1.0, meaning that these SIR values are statistically significant. SIR values for 13 of 17 other sites/types (for which SIRs can be calculated) among males were also less than 1.0, but were not statistically significant (see Appendix A).

Female residents of Lake Township had statistically significant SIR values less than 1.0 for all sites/types combined, lung and bronchus, and thyroid

cancers. The SIRs for lung and bronchus and thyroid cancers were 0.4 and 0.3 respectively. The SIR for all sites/types combined for females was 0.8. The 95% confidence intervals for these 3 categories of cancer among female residents of Lake Township did not contain 1.0 and thus are considered to be statistically significant. Of the remaining 19 categories of cancer for females for which SIR values could be calculated, 13 had SIR values less than 1.0 (fewer cases were observed than would be expected) that were not statistically significant.

While no statistically significant elevations of cancer were found in Lake Township for 1996 – 2001, several sites/types in both males and females had more observed cases than were expected. In females, 3 of 22 categories of cancer for which SIRs can be calculated had SIR values greater than 1.0 that were not statistically significant. Breast cancer in females, for example, had a SIR of 1.1. For this population, 114 cases of breast cancer would be expected, but 121 cases were observed. The 95% confidence interval for this SIR contained the null value (1.0), so this elevation was not determined to be statistically significant (see Appendix D).

In males, 4 of 20 categories of cancer for which SIRs can be calculated had SIR values greater than 1.0 that were not statistically significant. The highest SIR was in males for testicular cancer, an SIR of 1.8. National cancer incidence data for a comparable population indicated that 5 cases of testicular could be expected. In Lake Township from 1996 to 2001, 9 cases of testicular cancer occurred. While the SIR for this site/type was elevated well above 1.0,

the 95% confidence interval for the SIR contained 1.0, so the SIR was not found to be statistically significant (see Appendix B).

Based on cancer incidence data from 1996 to 2001, there is no evidence that the incidence of cancer in Lake Township, Stark County, Ohio is higher than would be expected. Rather than observing more cases of cancer than were expected, fewer cases of cancer were diagnosed during this time period than would be expected, based on national cancer incidence data for a comparable population. The ratios of observed to expected cases for all sites/types of cancer combined for both males and females indicated that fewer cases were observed than would be expected. These ratios were found to be statistically significant. Additional figures illustrating findings related to site/type, gender, and age are available in Appendix G.

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Appendix A:

Observed[1] and Expected[2] Number of Cases of Cancer by Site/Type among Males
Lake Township, Stark County, Ohio
1996 - 2001

	Males			
Cancer Site/Type	**Observed**	**Expected**	**SIR[3]**	**95% CI[4]**
All Sites/Types	268	360	0.7	0.62 - 0.79
Bladder	22	24	0.9	0.56 - 1.36
Brain and other CNS	4	6	0.7	0.19 - 1.79
Colon and Rectum	35	39	0.9	0.63 - 1.25
Esophagus	2	5	0.4	0.05 - 1.44
Hodgkin's Lymphoma	3	2	1.5	0.31 - 4.39
Kidney and Renal Pelvis	8	11	0.7	0.30 - 1.38
Larynx	1	5	0.2	0.01 - 1.11
Leukemias	10	11	0.9	0.43 - 1.65
Liver and Intrahepatic Bile Duct	1	4	0.3	0.01 - 1.67
Lung and Bronchus	43	50	0.9	0.66 - 1.20
Melanoma of the Skin	21	18	1.2	0.74 - 1.83
Multiple Myeloma	2	4	0.5	0.06 - 1.8
Non-Hodgkin's Lymphoma	6	16	0.4	0.15 - .87
Oral Cavity and Pharynx	9	11	0.8	0.37 - 1.52
Pancreas	5	8	0.6	0.19 - 1.4
Prostate	57	107	0.5	0.38 – 0.64
Stomach	9	6	1.5	0.69 - 2.84
Testis	9	5	1.8	0.83 - 3.42
Thyroid	1	3	0.3	0.01 - 1.67
Other Sites/Types	20	N/A	N/A	N/A

[1]Observed cases include cases reported to the Ohio Department of Health Ohio Cancer Incidence Surveillance System (OCISS).

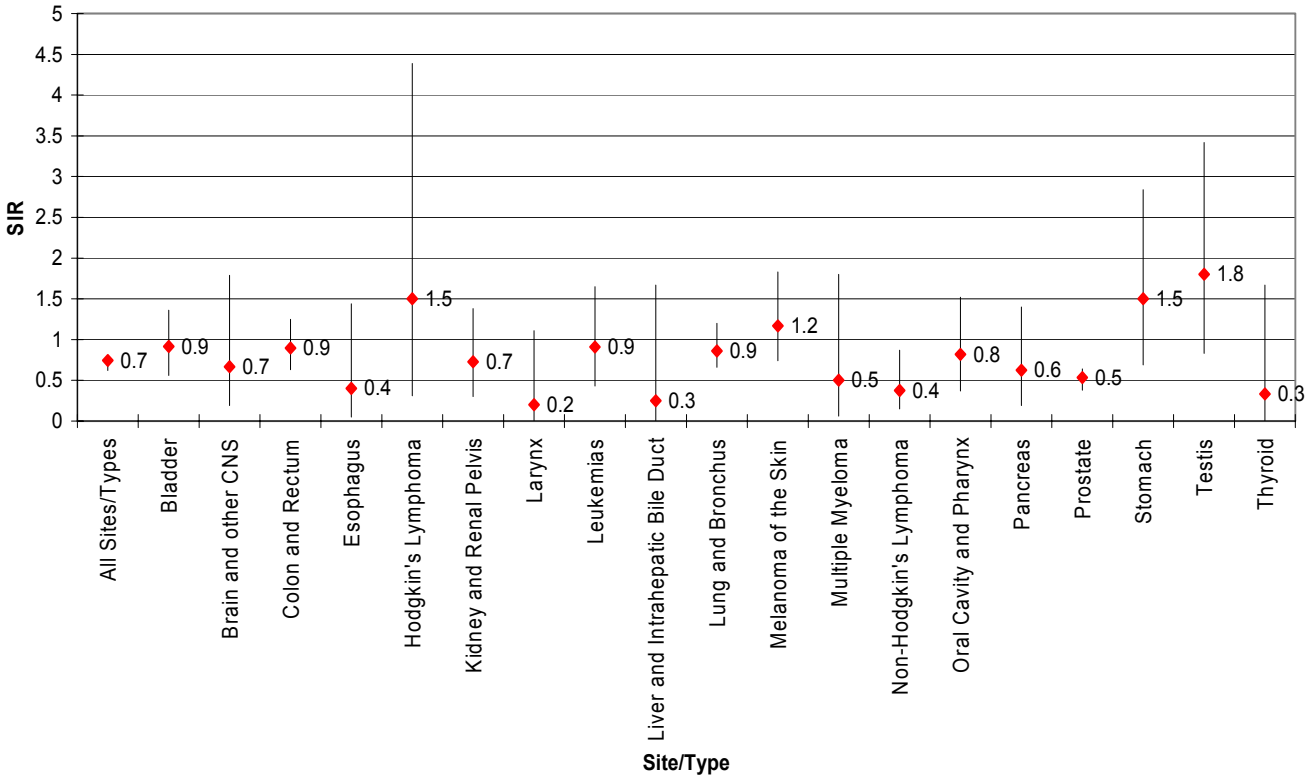
[2]Number of expected cases was calculated using the Surveillance, Epidemiology and End Results (SEER) Program 1997 - 2001 white age-specific cancer incidence rates. The expected number of cases was rounded to the nearest whole number.

[3]Standard Incidence Ratio (SIR) is the ratio of the number of observed cases to the number of expected cases. SIR >1 indicates that more cases of cancer were observed than were expected. SIR <1 indicates that fewer cases of cancer were observed than were expected.

[4]95% Confidence Intervals (CI) were examined to assess statistical significance, using the Poisson distribution for rare events. 95% CIs that do not contain the null value (1.0) are considered to be statistically significant.

Appendix B:

Standard Incidence Ratios (SIRs) for Cancer in Males
Lake Township, Stark County, Ohio
1996 - 2001
SIRs and 95% Confidence Intervals



Note: The diamond represents the SIR value and the line represents the 95% confidence interval. 95% confidence intervals that do not contain the null value (1.0) are considered to be statistically significant.

Appendix C:

Observed[1] and Expected[2] Number of Cases of Cancer by Site/Type among Females
Lake Township, Stark County, Ohio
1996 - 2001

	Females			
Cancer Site/Type	**Observed**	**Expected**	**SIR[3]**	**95% CI[4]**
All Sites/Types	279	332	0.8	0.72 - 0.90
Bladder	5	7	0.7	0.23 - 1.64
Brain and other CNS	4	5	0.8	0.22 - 2.05
Breast (Female)	121	114	1.1	0.91 - 1.32
Cervix	7	6	1.2	0.48 - 2.47
Colon and Rectum	32	34	0.9	0.61 - 1.29
Corpus Uteri	16	21	0.8	0.46 - 1.30
Esophagus	0	1	0.0	N/A
Hodgkin's Lymphoma	2	2	1.0	0.12 - 3.61
Kidney and Renal Pelvis	2	6	0.3	0.04 - 1.08
Larynx	1	1	1.0	0.03 - 5.56
Leukemias	6	7	0.9	0.33 - 1.96
Liver and Intrahepatic Bile Duct	1	2	0.5	0.01 - 2.78
Lung and Bronchus	17	39	0.4	0.23 – 0.64
Melanoma of the Skin	15	14	1.1	0.61 - 1.82
Multiple Myeloma	0	3	0.0	N/A
Non-Hodgkin's Lymphoma	7	13	0.5	0.20 - 1.03
Oral Cavity and Pharynx	3	5	0.6	0.12 - 1.75
Ovary	7	12	0.6	0.24 - 1.24
Pancreas	3	7	0.4	0.08 - 1.17
Stomach	3	3	1.0	0.21 - 2.92
Thyroid	3	9	0.3	0.06 – 0.88
Other Sites/Types	24	N/A	N/A	N/A

[1]Observed cases include cases reported to the Ohio Department of Health Ohio Cancer Incidence Surveillance System (OCISS).

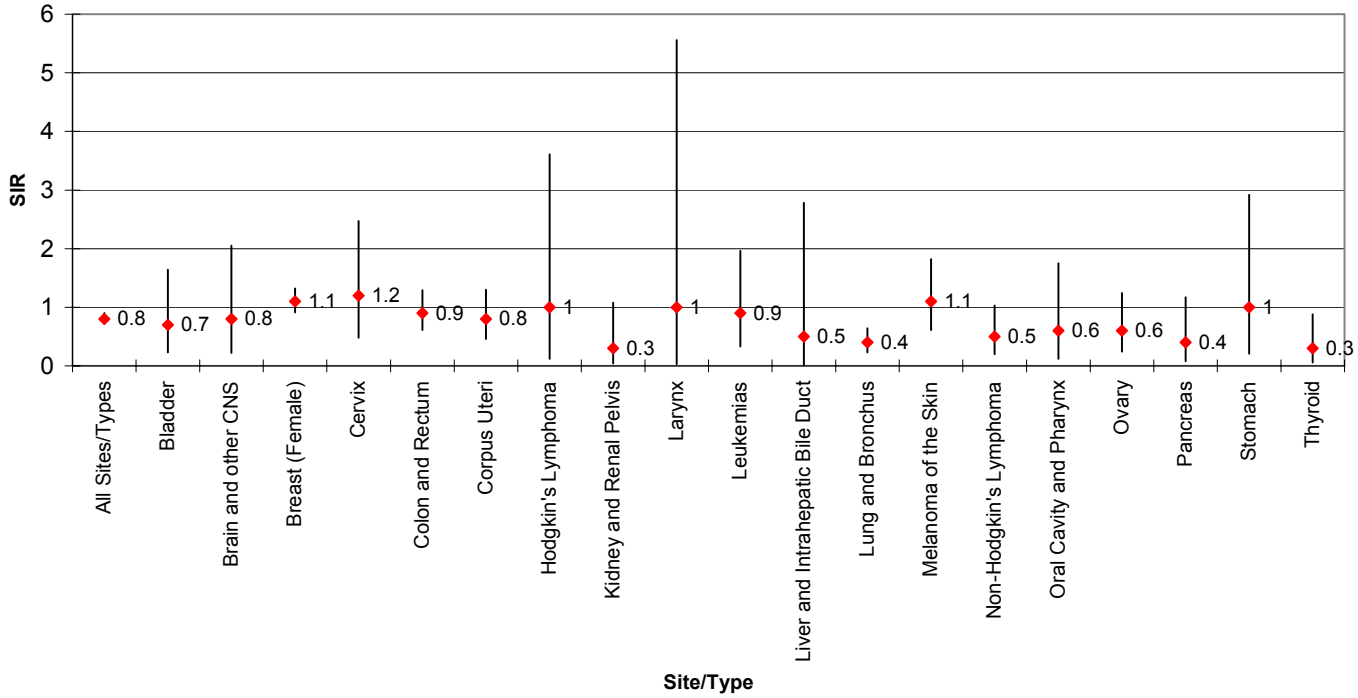
[2]Number of expected cases was calculated using the Surveillance, Epidemiology and End Results (SEER) Program 1997 - 2001 white age-specific cancer incidence rates. The expected number of cases was rounded to the nearest whole number.

[3]Standard Incidence Ratio (SIR) is the ratio of the number of observed cases to the number of expected cases. SIR >1 indicates that more cases of cancer were observed than were expected. These cells are highlighted in yellow. SIR <1 indicates that fewer cases of cancer were observed than were expected.

[4]95% Confidence Intervals (CI) were examined to assess statistical significance, using the Poisson distribution for rare events. 95% CIs that do not contain the null value (1.0) are considered to be statistically significant.

Appendix D:

Standard Incidence Ratios (SIRs) for Cancer in Females
Lake Township, Stark County, Ohio
1996 - 2001
SIRs and 95% Confidence Intervals



Note: The diamond represents the SIR value and the line represents the 95% confidence interval. 95% confidence intervals that do not contain the null value (1.0) are considered to be statistically significant.

Appendix E:

Number of New Cases of Cancer[1] and Age-Adjusted Incidence Rates[2] per 100,000 population by Site or Type of Cancer
Lake Township, Stark County, Ohio
1996 - 2001

	Lake Township 1996 - 2001		Stark County 1997 - 2001		Ohio 1997 - 2001	
Cancer Site/Type	**Cases**	**Rate**	**Cases**	**Rate**	**Cases**	**Rate**
All Sites/Types	547	390.2	10,108	471.4	276,149	472.3
Bladder	27	22.4	540	24.6	13,197	22.5
Brain and other CNS	8	4.7	148	7.3	3,922	6.8
Breast (Female)	121	154.7	1,569	135.3	42,139	131.7
Cervix	7	9.4	77	7.4	2,672	8.9
Colon and Rectum	67	50.1	1,275	58.3	33,757	57.5
Corpus Uteri	16	19.4	311	26.7	8,670	27.0
Esophagus	2	*	110	5.0	3,188	5.4
Hodgkin's Lymphoma	5	3.2	59	3.2	1,628	2.9
Kidney and Renal Pelvis	10	6.8	289	13.5	6,883	11.8
Larynx	2	*	91	4.3	2,724	4.7
Leukemias	16	10.1	248	11.7	6,378	11.0
Liver and Intrahepatic Bile Duct	2	*	89	4.1	2,306	3.9
Lung and Bronchus	60	45.9	1,543	70.5	45,234	76.8
Melanoma of the Skin	36	24.1	351	17.4	8,082	14.0
Multiple Myeloma	2	*	112	5.2	3,014	5.1
Non-Hodgkin's Lymphoma	13	8.9	421	19.6	11,197	19.2
Oral Cavity and Pharynx	12	8.3	181	8.6	5,462	9.4
Ovary	7	8.5	165	14.0	4,264	13.2
Pancreas	8	5.8	229	10.4	6,177	10.5
Prostate	57	95.9	1,296	138.4	37,807	150.7
Stomach	12	9.0	146	6.7	3,813	6.5
Testis	9	11.9	50	5.7	1,492	5.4
Thyroid	4	*	104	5.3	3,341	5.9
Other Sites/Types	44	N/A	704	N/A	19,111	N/A

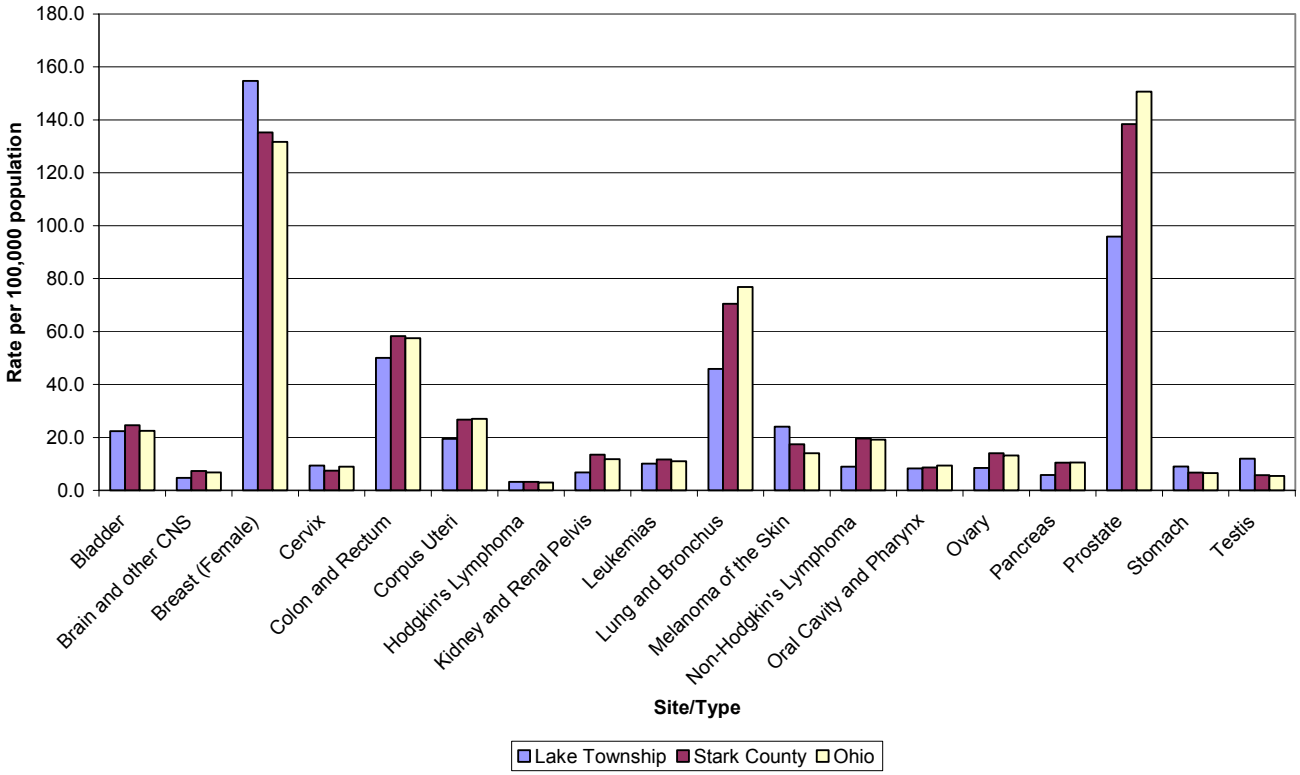
[1]As reported to the Ohio Department of Health, Ohio Cancer Incidence Surveillance System (OCISS).

[2]Age-adjusted incidence rates were calculated based on U.S. 2000 Census data. The rates were age-adjusted to the U.S. 2000 standard population. Rates are gender specific where appropriate.

*Age-adjusted incidence rates are not calculated for sites/types with case count less than 5.

Appendix F:

Age-Adjusted Cancer Incidence Rates
Lake Township (1996 - 2001), Stark County (1997 - 2001), and Ohio (1997 - 2001)



Note: Age-adjusted incidence rates were suppressed for Lake Township for sites/types with fewer than 5 cases in the given time period, including: Esophagus, Larynx, Liver and Intrahepatic Bile Duct, Multiple Myeloma, and Thyroid.

Appendix G:

Figure 1. Cases of Cancer by Site/Type in Lake Township, Stark County, Ohio

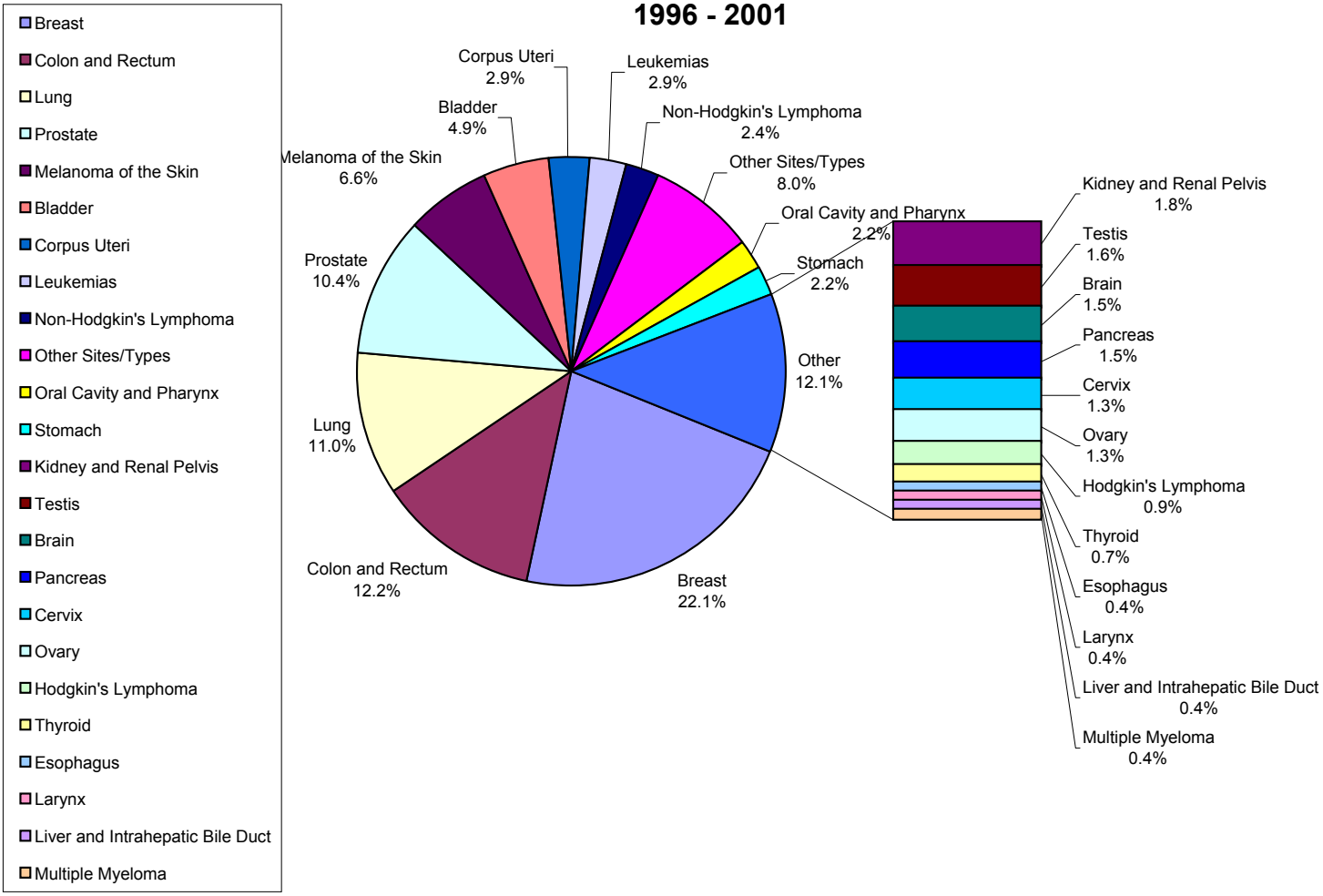


Figure 2. Total Cancer Cases by Age, Lake Township, 1996 - 2001