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Illinois Department of Public Health

Incidence of Cancer in ZIP Codes 60655, 60643, 60805, and 60453 in Cook County Illinois, 2005-2014

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Incidence of Cancer in ZIP Codes 60655, 60643, 60805, and 60453
2005-2014

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Abstract

Several community members as well as a state legislator contacted the Illinois Department of Public Health, Division of Epidemiologic Studies, with a request to evaluate the cancer incidence in zip codes 60655 (Mt. Greenwood Chicago community area), 60643 (Beverly, Morgan Park and Washington Heights Chicago community areas), 60805 (Evergreen Park, IL), 60453 (Oak Lawn, IL). Incident cancer cases for 2005-2014 were compiled from the Illinois State Cancer Registry. Incident cancers for the entire area as well as the specific zip codes were compared to that of Cook County Illinois. Data was stratified by age, sex, and site. Observed incident cases were compared to the expected number of cases utilizing a Poisson model. Overall, the geographic area encompassed by the four zips codes 60655, 60643, 60805, and 60453 displayed higher than expected counts of lung cancer in White men and women, and prostate cancer in White and Black men. Other sites that realized an increased number of observed cases across zip codes include invasive breast cancer in Black women and uterine cancer in White women. Overall, the all other sites category displayed lower than expected case in White males and females. Pediatric cancer cases for the total area as well as the specific zip codes did not display any significant differences.

Background

Several community members as well as a state legislator contacted the Illinois Department of Public Health, Division of Epidemiologic Studies, with a request to evaluate the cancer incidence in zip codes 60655 (Mt. Greenwood Chicago community area), 60643 (Beverly, Morgan Park and Washington Heights Chicago community areas), 60805 (Evergreen Park, IL), and 60453 (Oak Lawn, IL). Investigations of two zip codes representing the Beverly and Mt Greenwood areas of Chicago were completed in July of 2006. The zip codes utilized in these studies are not comparable to the current selection of zip codes for this study and thus prior results will not be compared. This study included many more years of data compared to prior examinations in addition to a larger geographic area at the request of concerned citizens. Figure 1 shows the four zip codes of interest and surrounding areas.

Materials and Methods

ZIP code is the smallest geographic area for which the Illinois State Cancer Registry (ISCR) aggregates and presents data; therefore, the study area was defined as ZIP codes 60655, 60643, 60805, and 60453. These zip codes encompass an area at the southwest side of the city of Chicago as well as the villages of Evergreen Park and Oak Lawn. All cases of cancer diagnosed among residents of the study area for the most recent ten years of complete data at the time of the study, 2005 through 2014, were identified. The source for these data was the Illinois State Cancer Registry (ISCR).

Identification of cancer cases in ISCR is dependent upon reporting by diagnostic and therapeutic facilities as mandated by state law

Cancer patients do not always get diagnosed in Illinois. In order to capture out-of-state cases, ISCR has agreements with other central cancer registries to identify Illinois resident cases which are identified outside the state and to share that data with ISCR. These registries include Arkansas, California, Florida, Indiana, Iowa, Kentucky, Michigan, Mississippi (through August 2004), Missouri, North Carolina, Washington, Wisconsin, Wyoming (through February 2008), and the Mayo clinic in Minnesota (through October 2005). Completeness of out-of-state reporting depends upon the years of operation of these other central registries, the extent of their identification of out-of-state residents, and their standards of quality. Out-of-state diagnoses among residents of the area covered by the four zip codes accounted for less than one percent (0.4%) of the total number of cases reported, between 2005 and 2014, and were included in the study. Individual percentages of out of state diagnoses for each zip code ranged between 0.3% and 0.4%.

To benchmark and foster best practices among population-based registries, the North American Association of Central Cancer Registries (NAACCR) has developed a certification process that reviews registry data for completeness, accuracy, and timeliness of reporting. As of May 2017, ISCR data met the criteria for gold certification for cancer diagnosis years 2005 through 2013. The statewide completeness of case reporting from all reporting sources, assessed using the NAACCR Standard, is estimated to be 100 percent complete for all years between 2005 and 2014. The criteria

for silver and gold certification can be found on the NAACCR web site at http://www.naaccr.org/Certification/index.html.

All cancer cases from the study area were grouped by tumor site, sex, age, and race. These are referred to as the *observed* cases. Race-, age- and sex-specific rates from a comparable population in Illinois were applied to each age group of the study population (indirect adjustment) and to each tumor site to obtain an *expected* number of cases for the study area.[1] The tumor site groups included oral cavity, esophagus, stomach, colon and rectum, liver, pancreas, lung and bronchus, bone, melanoma, breast, cervix, uterus, ovary, prostate, testis, bladder, kidney, brain and nervous system, Hodgkin lymphoma, non-Hodgkin lymphoma, multiple myeloma, leukemia, thyroid, and all other cancers. The site recode scheme used in this analysis was the International Classification of Diseases for Oncology version 3 (ICD-O-3) recode with adjustment for hematopoietic histologies as defined by the Surveillance Epidemiology and End Results Program (SEER) of the National Cancer Institute (NCI). See Appendix A for more detail.

In addition to the examination of adult cancers this study also examined pediatric cancer for children ages 0 to 19 years old in these specific zip code areas. Tumors diagnosed in children are classified using the SEER site/histology recode based on the International Classification of Childhood Cancer, Third Edition and ICD-O-3 (see Appendix B). Sites examined include leukemias, lymphomas, central nervous system tumors and all other sites. The category ‘all other sites’ includes different pediatric tumor sites that were collapsed into one category due to the small number and lack of cases in individual sites.

The comparable population was defined as the population in a reference area with a similar population density and race distribution as the study area and with a large enough population to provide stable estimates.[2] ISCR has defined and maintained four reference groups (urban Cook County, suburban five collar counties, small urban with 13 counties, and rural with 83 counties) for Illinois based on population density, rate of growth, Beale codes, and with a total population of at least 2 million. The comparable population for the zip codes of interest in this study was the urban county of Cook, because the population density and other demographic characteristics matched those of the study area better than any other reference groups.

Age-, sex-, and race-specific population counts of ZIP code areas in Illinois for each year between 2005-2010, and 2011-2014 were interpolated/extrapolated based on the population counts from the 2000 and 2010 U.S. Census, the most reliable sources for small area population. Age-, sex-, and race-specific population counts for a ZIP code area were created through application of a linear function to stratified counts from the 2000 and 2010 census.

Age-, sex-, and race-specific population counts for the reference area for each year were obtained from the SEER program.[3] They represent a modification of the annual time series of July 1 county population estimates by age, sex, race, and Hispanic origin produced by the Population Estimates Program of the U.S. Bureau of the Census with support from the National Cancer Institute through an interagency agreement. The bridged single-race estimates and a description of the methodology used to develop them appear on the National Center of Health Statistics (NCHS) web site https://www.cdc.gov/nchs/nvss/bridged_race.htm.

The observed number of cases was statistically compared with the expected number of cases for all age-, sex-, and site-specific categories based on the Poisson model. This model, while suitable for modeling rare events, can approximate a normal distribution for larger numbers of events which was the case in several strata in this analysis. A probability (p-value) of 0.01 or less for an observed number of cancer cases that was higher or lower than the expected number was considered to be a statistically significant difference.[4-7] A statistically significant difference means the difference, as judged by statistical evidence, is unlikely to have occurred by chance. The particular p-value chosen was to offset some inevitable bias due to the multiple comparison issue encountered in this study.

Results

Combined Geographic Area (All four zip codes)

White residents - The incidence of cancer among White males in the entire study area was 3171 cases observed with 2954 cases expected. This difference was statistically significant. Two specific sites displayed significantly higher observed counts in White males and they were lung (484 observed and 401 expected) and prostate (826 observed and 727 expected). Also, the all other sites category displayed significantly fewer cases than expected (242 observed and 303 expected). In White females, 3482 cases were observed while 3522 cases were expected. The difference in total cancer incidence was not statistically significant for White females, however lung cancer incidence in White females was significantly higher with 533 cases observed and 434 expected as was uterine cancer with 253 cases observed and 214 expected. Also,

Thyroid cancer was significantly lower in White females with 76 cases observed and 111 expected as was the all other sites category with 270 cases expected and 393 observed (Table 1).

Black residents- The incidence of cancer among Black males in the study area was 1397 cases observed with 1377 cases expected. This difference was not statistically significant. However, prostate cases in Black males were significantly higher (550 observed and 477 expected). In Black females, 1608 cases were observed while 1572 cases were expected. The difference in total cancer incidence was not statistically significant for Black females. Significant site specific differences did exist for Black females with respect to invasive breast cancer (474 observed and 410 expected, Table 1).

Children - The incidence of cancer in all children aged 0 to 19 years of age was 82 cases observed and 72 expected. This difference was not statistically significant and no specific sites were identified as having significantly higher or lower observed incident case counts (Table 2).

In addition to comparing the observed and expected incident cases for the area Table 3 displays the distribution of pediatric cancer cases by age and by site. The distribution of cases across ages and across sites in the combined zip code area was quite similar when compared to the distribution of cases in Cook County.

Zip Code 60655 (Mt. Greenwood Chicago community area)

White residents- The incidence of cancer among White males in the 60655 zip code area was 671 cases observed with 605 cases expected. This difference was statistically significant. Two specific site categories displayed significant differences in White males. Lung cancer, displayed a significantly higher number of observed cases (103) compared to the expected number (79) and the all other sites category displayed significantly fewer observed cases (39) compared to those expected (63). In White females, 650 cases were observed while 640 cases were expected. The difference in total cancer incidence was not statistically significant for White females. The all other sites category displayed significantly lower number of observed cases (50 observed, 81 expected, Table 4).

Black residents- The incidence of cancer among Black males in the 60655 zip code area was 24 cases observed with 43 cases expected. This difference was significantly lower than expected cancer incidence. No specific sites displayed significantly higher or lower observed counts in Black men. In Black females, 59 cases were observed while 42 cases were expected. The difference in total cancer incidence was not statistically significant for Black females. Melanoma displayed a significantly higher number of cases in Black females with two cases observed and zero expected (Table 4).

Children - The incidence of cancer in all children aged 0 to 19 years of age was 14 cases observed and 14 expected. This difference was not statistically significant and no specific sites were identified as having significantly higher or lower observed incident case counts (Table 2).

Zip Code 60643 (Beverly, and portions of the Morgan Park and Washington Heights Chicago community areas)

White residents- The incidence of cancer among White males in the 60643 zip code area was 362 cases observed with 356 cases expected. This difference was not statistically significant. Prostate cancer displayed significantly higher counts of incident cases in White men (124 observed and 91 expected). In White females, 387 cases of cancer were observed while 371 cases were expected. The difference in total cancer incidence was not statistically significant for White females. The all other sites category displayed significantly lower numbers of cases than what was expected (28 observed and 45 expected, Table 5).

Black residents- The incidence of cancer among Black males in the 60643 zip code area was 1,207 cases observed with 1,199 cases expected. This difference was not statistically significant. Prostate cancer displayed significantly higher counts of incident cases in Black men (487 observed and 416 expected). In Black females, 1,195 cases were observed while 1,218 cases were expected. The difference in total cancer incidence was not statistically significant for Black females. No other specific sites displayed significant differences in Black females (Table 5).

Children - The incidence of cancer in all children aged 0 to 19 years of age in the 60643 zip code was 28 cases observed and 24 expected. This difference was not statistically significant and no specific sites were identified as having significantly higher or lower observed incident case counts (Table 2).

Zip Code 60805 (Evergreen Park, IL)

White residents- The incidence of cancer among White males in the 60805 zip code area was 483 cases observed with 413 cases expected. While the difference in the total cancer incidence was statistically significant, no individual cancer sites displayed significantly higher observed cases counts. In White females, 487 cases were observed while 453 cases were expected. The difference in total cancer incidence was not statistically significant for White females. Lung cancer in White females did display significantly higher incident cases with 85 observed and 60 expected (Table 6).

Black residents- The incidence of cancer among Black males in the 60805 zip code area was 73 cases observed with 74 cases expected. This difference was not statistically significant. No significant differences were found in specific cancer sites in Black males. In Black females, 90 cases were observed while 90 cases were expected. The difference in total cancer incidence was not statistically significant for Black females. Other specific sites did not displayed significantly higher or lower observed counts in Black females (Table 6).

Children - The incidence of cancer in all children aged 0 to 19 years of age in the 60805 zip code was 10 cases observed and 10 expected. No difference was observed for the total of all pediatric cancer sites and no specific sites were identified as having significantly higher or lower observed incident case counts (Table 2).

Zip Code 60453 (Oak Lawn, IL)

White residents- The incidence of cancer among White males in the 60453 zip code area was 1,655 cases observed with 1,550 cases expected. This difference in the total cancer incidence was not statistically significant. However, lung cancer in White males was significantly higher with 268 cases observed and 218 cases expected. In White females 1,775 incident cancers were observed and 1,723 cases were expected. The difference in total cancer incidence was not statistically significant for White females. Lung cancer in White females did display significantly higher incident cases with 294 observed and 243 expected. Also, thyroid cancer displayed significantly lower rates of incident cases with 28 observed and 55 expected as did the all other sites category with 152 case observed and 211 expected (Table 7).

Black residents- The incidence of cancer among Black males in the 60453 zip code area was 93 cases observed with 62 cases expected. This difference was statistically significant. No significant differences were found in specific cancer sites in Black males. In Black females, 120 cases were observed while 83 cases were expected. The difference in total cancer incidence was statistically significant for Black females. Invasive breast cancer displayed a significantly higher number of observed cases (40 observed) compared to those expected (24 expected, Table 7).

Children - The incidence of cancer in all children aged 0 to 19 years of age in the 60453 zip code was 30 cases observed and 24 expected. No difference was observed for the total of all pediatric cancer sites and no specific sites were identified as having significantly higher or lower observed incident case counts (Table 2).

Female Breast Cancer

Additional analysis of malignant breast cancer for women by age (<50 and 50+), by race, and by individual zip code revealed significantly higher than expected breast cancer cases in women less than fifty years old in two geographic groups. Women younger than fifty, of all races across the entire zip code area exhibited a significantly higher than expected number of cases (288 observed and 235 expected). Women younger than 50 years old, all race groups, and in zip-code 60643 exhibited significantly higher than expected number of malignant breast cancer (110 observed and 78 expected).

Discussion

Overall, the geographic area encompassed by the four zips codes 60655, 60643, 60805, and 60453 displayed higher than expected counts of lung cancer in White men and women, prostate cancer in White and Black men, and uterine cancer in White women. The increase in lung cancer appeared most in zip code 60453, both men and women, and females in zip code 60805. Higher than expected number of prostate cancer cases appeared to center in zip code 60643 with higher than expected case counts in both White and Black men. Invasive breast cancer in Black women realized an increased number of observed cases across zip codes. Zip code 60453 appears to be driving the increase in cases with significant excess cases of invasive breast cancer in Black women. Two cases of melanoma in Black women in the 60655 zip code were unusual given that none were expected. Several sites did display a lower than expected number of cases. Overall, the all other sites category displayed lower than expected case in White males and females. This was the case in zip code 60655 and in White females residing in zip code 60643. White females in zip code 60453 displayed a lower

than expected number of thyroid cancer cases. Black women in zip code 60643 displayed lower than expected counts of thyroid cancers and Non-Hodgkin's lymphoma cases.

Pediatric cancer cases for the total area as well as the specific zip codes contained therein did not display any significant differences between the number of cases observed and those expected.

Female breast cancer cases in women younger than 50 displayed higher than expected counts for all races in the entire zip code area as well as zip code 60643.

In drawing conclusions from these data, some limitations need to be considered. First, given the diversity of cancer sites that were observed to be higher than expected, it is impossible to theorize about any common environmental exposure that could be a contributing factor to increased risk of cancer in these geographic areas, because specific cancer sites have differing etiologies, risk factors, and mediating factors.

Second, due to the lack of annual detailed population data from the Census for ZIP code areas, populations for 2005-2014 were interpolated based on the population counts from the 2000 and 2010 U.S. Census (see Methods section). These imprecise denominator numbers, when used to derive age- and sex-specific expected numbers, might have introduced errors and biases to the comparison, of which neither the direction nor the magnitude was known. While difficult to quantify in the current analysis it is suspected that a number of significant differences could have been caused by the lack of reliable denominator data.

Third, many potential risk factors to cancer, including occupation, diet, lifestyle, family history, and other medical conditions, are not collected by ISCR and, as a result, their inclusion for analysis was not possible. Living in the any of the ZIP codes at the time of diagnosis was used to represent the population at risk. The lack of case-level information on the history of residence in the study area made more refined analysis and comparison impossible.

Fourth, the length of time or latency period between the time of exposure to a carcinogenic substance and the onset of clinically-recognizable disease for most adult cancers is between 10 and 20 years. Specific cancers may vary somewhat in the length of the latent period, but generally speaking, recent exposure, that is, exposures in the last 10 years, cannot be expected to be associated with current cancer incidence.

Fifth, the power of the statistical test could vary. This is the probability that a true departure from the expected number can be detected by significance testing. A non-significant difference sometimes reflects the low statistical power rather than the absence of differences. The power of a test varies with the number of cases expected.[8] In this study, the power of detecting a doubling was low when the expected number of cases was below 16. To the extent possible, cancer groups were pooled and combined in this assessment to increase the number of expected cases, thus the statistical power.

Sixth, the boundaries used to define the study area are essentially arbitrary boundaries that might have no connection to any exposure that could potentially affect cancer rates. Ideally, cancer cluster investigations should be precipitated by some type of carcinogenic exposure. That exposure would then define the study area and resulting

comparisons would highlight any differences in cancer occurrence. Boundaries such as zip codes do allow for consistency in cancer reporting. However, one must keep in mind that the geographic boundaries are artificial and have no logical connection to the development of cancer.

Finally, and potentially most important, random fluctuation in cancer distributions and its associated chance occurrences, cannot be ruled out in explaining differences between the observed and expected numbers, even if the difference is statistically significant. The problem of chance occurrences, often severe with small numbers, could be further amplified by the practice of conducting multiple statistical tests and comparisons such as what was done in the current study.

The following contains general information about cancer:

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.[9] The number of people with cancer is increasing in most communities because more people are living to the ages of greatest cancer occurrence.[10]

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.

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 U.S. Environmental and occupational exposures to cancer-causing chemicals, ionizing radiation, and other agents produced by humans also contribute to cancer risk.[11]

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.[12]

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).

A cancer cluster most likely involves a large number of cases of the same type of cancer, rather than several different types, a rare type of cancer, rather than common types, or an increased number of cases of a certain type of cancer in an age group that is not usually affected by that type of cancer.[10] The occurrence of several types of cancer in a group of people or a geographic area generally does not constitute a cancer cluster

Also, cancer does not develop immediately after contact with a cancer-causing agent. 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.

Why can't a study prove the cause of cancer?

Often, an analysis that is based on small numbers cannot even distinguish a real change from the changes that are created by chance. In a general sense, finding causes of any disease is usually a long, slow process. Finally, it needs to be remembered that no single epidemiologic study or even a large number of epidemiologic studies can enable a person to know why he/she developed cancer. Many limitations exist that are a part of any cancer assessment study.[12]

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Figure 1: Map of ZIP codes 60655, 60643, 60805 and 60453 in Cook County, Illinois

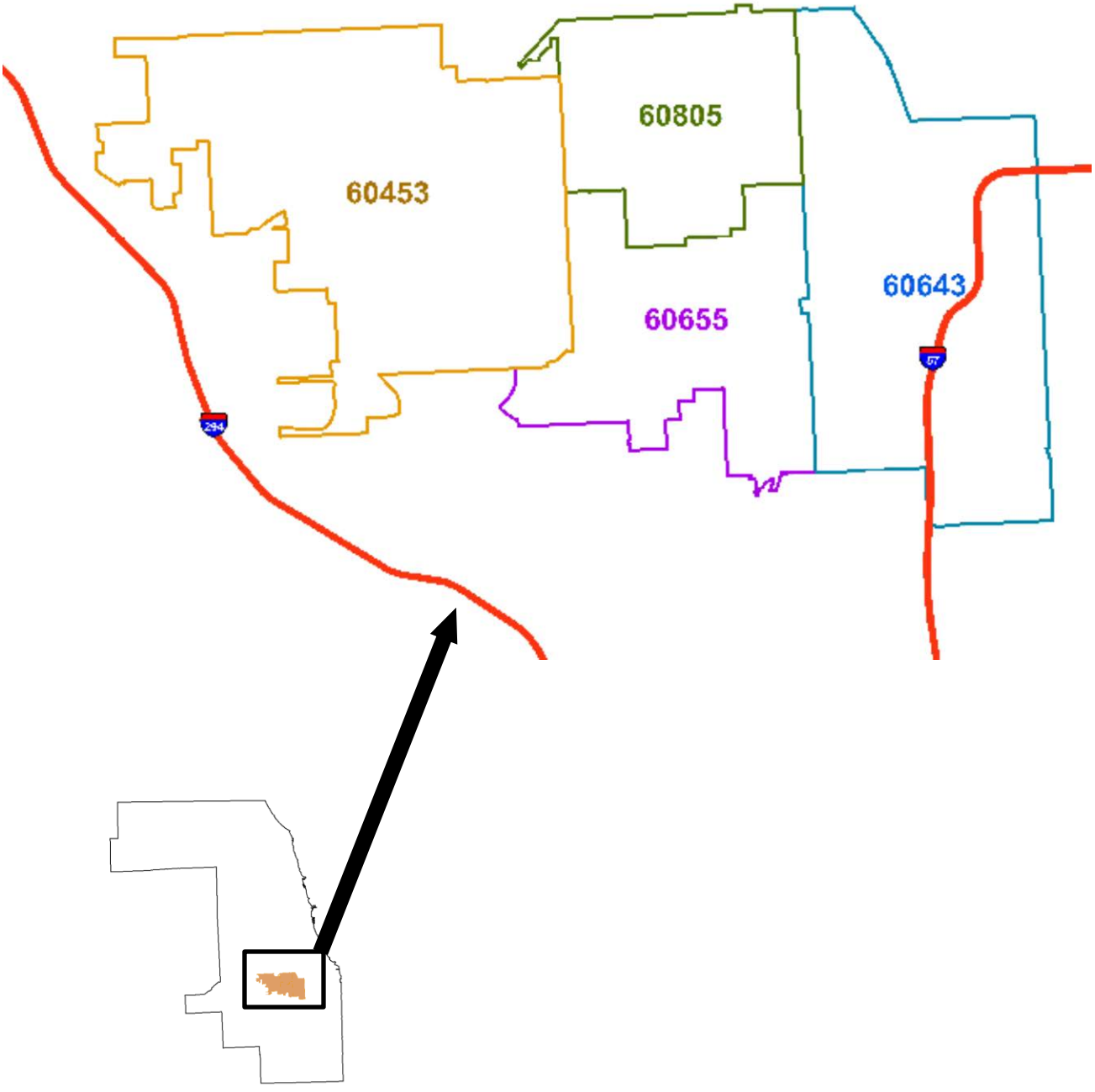

Table 1: Observed and Expected Numbers of Cancer Cases by Site and Sex

Residents of ZIP Codes 60655, 60643, 60805, and 60453, Illinois, 2005-2014

	White				Black			
	Males		Females		Males		Females	
Cancer Site Group	Obs.	Exp.[a]	Obs.	Exp.[a]	Obs.	Exp.[a]	Obs.	Exp.[a]
Oral Cavity	107	96	55	46	36	44	15	21
Esophagus	62	46	12	16	15	20	13	10
Stomach	76	64	45	46	36	37	27	27
Colorectal	328	307	351	317	146	157	157	173
Liver	70	62	27	25	20	33	14	14
Pancreas	85	87	106	99	40	40	65	52
Lung and Bronchus	484*	401	533*	434	212	228	189	219
Bone	9	5	4	4	2	2	0	2
Melanomas	138	121	97	90	0	2	3	2
Breast invasive			897	889			474*	414
Cervix			42	48			39	39
Uterus			253*	214			90	89
Ovary			86	95			40	33
Prostate	826*	727			550*	477		
Testis	35	29			5	3		
Bladder	217	221	72	88	33	43	28	27

Table 1 (CONT.): Observed and Expected Numbers of Cancer Cases by Site and Sex

Residents of ZIP Codes 60655, 60643, 60805, and 60453, Illinois, 2005-2014

	White				Black			
	Males		Females		Males		Females	
Kidney	114	119	102	84	61	57	33	41
Nervous System	41	41	39	36	12	10	17	11
Hodgkin Lymphomas	18	17	11	14	5	7	7	6
Non-Hodgkin Lymphomas	150	138	113	134	48	34	30	36
Myelomas	34	39	33	36	31	29	33	35
Leukemia	85	94	72	79	34	31	32	27
All Other Sites	242*	303	270*	393	98	120	134	155
Thyroid	26	38	76*	111	7	6	24	30
All Sites	3,171*	2,924	3,299	3,187	1,397	1,377	1,464	1,433

SOURCE: Illinois State Cancer Registry, November 2016.

[a] Expected numbers are based on the age- and sex-specific incidence rates in persons in an area of Illinois with a similar population density and race distribution as the study area.

[b] Numbers do not add to total due to rounding.

* Differences between the observed and expected numbers of cases was significant at $p < .01$

Table 2: Observed and Expected Numbers of Pediatric Cancer Cases by Site for Residents Age 0-19 of ZIP Codes 60655, 60643, 60805, and 60453, Illinois, 2005-2014

Site	Combined Zip Area		60655		60643		60805		60453	
	Obs.	Exp.[a]	Obs.	Exp.[a]	Obs.	Exp.[a]	Obs.	Exp.[a]	Obs.	Exp.[a]
All Sites	82	72	14	14	28	24	10	10	30	24
Leukemia	19	20	4	4	7	6	0	3	8	7
Lymphoma	16	11	2	2	7	4	1	2	6	4
Central Nervous System	14	11	1	2	5	4	4	2	4	4

SOURCE: Illinois State Cancer Registry, November 2016.

[a] Expected numbers are based on the age- and sex-specific incidence rates in persons in an area of Illinois with a similar population density and race distribution as the study area.

[b] Numbers do not add to total due to rounding and specific sites not been shown due to small numbers.

NOTE: None of the differences between the observed and expected numbers of cases was significant at $p < .01$.

Table 3: Distribution of Incident Pediatric Cancer Cases Age 0-19 for Combined ZIP Codes (60655, 60643, 60805, 60453) and Cook County, Illinois, 2005-2014

Years of Age	Cook	*% of Total*	Combined Zip Area	*% of Total*
<5	715	*29*	17	*21*
5-9	418	*17*	16	*20*
10-14	502	*21*	19	*23*
15-19	811	*33*	30	*37*
ALL AGES	**2446**		**82**	
Site				
Leukemia	673	*28*	19	*23*
Lymphoma	370	*15*	16	*20*
Central nervous System	390	*16*	14	*17*
Neuroblastoma	108	*4*	3	*4*
Retinoblastoma	54	*2*	3	*4*
Renal tumors	86	*4*	1	*1*
Hepatic tumors	32	*1*	0	*0*
Malignant Bone tumors	122	*5*	5	*6*
Soft tissue and other sarcomas	181	*7*	10	*12*
Germ Cell	171	*7*	5	*6*
Other Malignant Epithelial	251	*10*	6	*7*
Other & Unspecified	7	*<1*	0	*0*
Not Classified	1	*<1*	0	*0*
ALL SITES	**2446**		**82**	

SOURCE: Illinois State Cancer Registry, November 2016.

Table 4: Observed and Expected Numbers of Cancer Cases by Site and Sex Residents of ZIP Code 60655, Illinois, 2005-2014								
	White				Black			
	Males		Females		Males		Females	
Cancer Site Group	Obs.	Exp.[a]	Obs.	Exp.[a]	Obs.	Exp.[a]	Obs.	Exp.[a]
Oral Cavity	30	21	11	9	1	2	2	1
Esophagus	17	10	2	3	1	1	0	0
Stomach	14	13	8	9	0	1	0	1
Colorectal	77	62	64	60	0	5	6	5
Liver	20	13	7	5	1	1	1	0
Pancreas	15	17	21	18	2	1	2	1
Lung and Bronchus	103*	79	97	81	1	7	7	5
Bone	1	1	0	1	0	0	0	0
Melanomas	32	25	18	20	0	0	2*	0
Breast invasive			184	185			23	13
Cervix			8	11			1	2
Uterus			54	45			2	3
Ovary			10	20			0	1
Prostate	184	152			12	15		
Testis	9	8			0	0		
Bladder	41	42	13	16	0	1	2	1

Table 4 (CONT.): Observed and Expected Numbers of Cancer Cases by Site and Sex

Residents of ZIP Code 60655, Illinois, 2005-2014

	White				Black			
	Males		Females		Males		Females	
Kidney	21	26	26	17	3	2	1	1
Nervous System	9	10	5	8	0	0	0	0
Hodgkin Lymphomas	3	4	1	3	0	0	0	0
Non-Hodgkin Lymphomas	23	29	29	26	1	1	2	1
Myelomas	9	8	8	7	0	1	1	1
Leukemia	20	20	11	16	0	1	0	1
All Other Sites	39*	63	50*	81	2	4	3	5
Thyroid	2	9	22	26	0	0	4	1
All Sites	671*	605	700	716	24*	43	59	42

SOURCE: Illinois State Cancer Registry, November 2016.

[a] Expected numbers are based on the age- and sex-specific incidence rates in persons in an area of Illinois with a similar population density and race distribution as the study area.

[b] Numbers do not add to total due to rounding.

* Differences between the observed and expected numbers of cases was significant at $p < .01$

Table 5: Observed and Expected Numbers of Cancer Cases by Site and Sex Residents of ZIP Code 60643, Illinois, 2005-2014								
	White				Black			
	Males		Females		Males		Females	
Cancer Site Group	Obs.	Exp.[a]	Obs.	Exp.[a]	Obs.	Exp.[a]	Obs.	Exp.[a]
Oral Cavity	12	12	6	6	31	38	12	18
Esophagus	6	6	1	2	13	17	11	9
Stomach	10	8	5	5	31	33	20	24
Colorectal	22	37	41	36	128	137	126	148
Liver	6	8	3	3	16	29	11	12
Pancreas	9	11	12	11	33	35	53	45
Lung and Bronchus	45	48	57	50	182	199	155	189
Bone	1	1	0	1	2	2	0	2
Melanomas	14	15	12	10	0	1	1	2
Breast invasive			119	106			386	349
Cervix			2	6			34	32
Uterus			21	26			76	76
Ovary			9	11			37	28
Prostate	124*	91			487*	416		
Testis	4	3			4	2		

Table 5 (CONT.): Observed and Expected Numbers of Cancer Cases by Site and Sex

Residents of ZIP Code 60643, Illinois, 2005-2014

	White				Black			
	Males		Females		Males		Females	
Bladder	25	26	12	10	28	38	21	23
Kidney	14	15	10	10	54	49	27	35
Nervous System	2	5	4	4	9	8	12	9
Hodgkin Lymphomas	3	2	2	2	4	6	5	5
Non-Hodgkin Lymphomas	20	17	15	15	36	29	20	30
Myelomas	2	5	4	4	27	25	29	30
Leukemia	9	11	11	9	29	27	27	23
All Other Sites	27	36	28*	45	81	104	113	131
Thyroid	5	5	13	13	7	5	19	24
All Sites	362	356	387	371	1,207	1,198	1,195	1,218

SOURCE: Illinois State Cancer Registry, November 2016.

[a] Expected numbers are based on the age- and sex-specific incidence rates in persons in an area of Illinois with a similar population density and race distribution as the study area.

[b] Numbers do not add to total due to rounding.

* Differences between the observed and expected numbers of cases was significant at $p < .01$

Table 6: Observed and Expected Numbers of Cancer Cases by Site and Sex Residents of ZIP Code 60805, Illinois, 2005-2014								
	White				Black			
	Males		Females		Males		Females	
Cancer Site Group	Obs.	Exp.[a]	Obs.	Exp.[a]	Obs.	Exp.[a]	Obs.	Exp.[a]
Oral Cavity	22	14	10	7	1	3	1	1
Esophagus	14	7	3	2	0	1	2	1
Stomach	9	9	6	7	4	2	2	2
Colorectal	51	44	48	45	7	8	7	10
Liver	12	9	1	4	3	2	2	1
Pancreas	13	12	12	14	2	2	6	3
Lung and Bronchus	68	56	85*	60	10	12	12	13
Bone	2	1	1	1	0	0	0	0
Melanomas	24	17	11	13	0	0	0	0
Breast invasive			142	127			25	27
Cervix			13	7			2	3
Uterus			37	30			2	5
Ovary			10	14			1	2
Prostate	120	101			22	25		
Testis	3	4			0	0		
Bladder	29	31	6	12	3	2	3	1

Table 6 (CONT.): Observed and Expected Numbers of Cancer Cases by Site and Sex

Residents of ZIP Code 60805, Illinois, 2005-2014

	White				Black			
	Males		Females		Males		Females	
Kidney	28	17	10	12	0	3	2	3
Nervous System	10	6	7	5	1	1	2	1
Hodgkin Lymphomas	2	2	1	2	1	1	2	1
Non-Hodgkin Lymphomas	25	20	14	19	6	2	5	2
Myelomas	4	6	5	5	4	2	0	2
Leukemia	5	13	11	11	3	2	3	2
All Other Sites	36	43	40	56	5	7	11	10
Thyroid	4	5	13	16	0	0	0	2
All Sites	483*	413	487	452	73	74	90	90

SOURCE: Illinois State Cancer Registry, November 2016.

[a] Expected numbers are based on the age- and sex-specific incidence rates in persons in an area of Illinois with a similar population density and race distribution as the study area.

[b] Numbers do not add to total due to rounding.

* Differences between the observed and expected numbers of cases was significant at $p < .01$

Table 7: Observed and Expected Numbers of Cancer Cases by Site and Sex Residents of ZIP Code 60453, Illinois, 2005-2014								
	White				Black			
	Males		Females		Males		Females	
Cancer Site Group	Obs.	Exp.[a]	Obs.	Exp.[a]	Obs.	Exp.[a]	Obs.	Exp.[a]
Oral Cavity	43	49	28	25	3	2	0	1
Esophagus	25	25	6	9	1	1	0	1
Stomach	43	34	26	26	1	2	5	2
Colorectal	178	164	198	176	11	7	18	10
Liver	32	32	16	14	0	2	0	1
Pancreas	48	47	61	56	3	2	4	3
Lung and Bronchus	268*	218	294*	243	19	10	15	12
Bone	5	3	3	2	0	0	0	0
Melanomas	68	63	56	47	0	0	0	0
Breast invasive			452	471			40*	24
Cervix			19	24			2	2
Uterus			141	113			10	5
Ovary			57	51			2	2
Prostate	398	383			29	21		
Testis	19	14			1	0		
Bladder	122	121	41	49	2	2	2	1

Table 7 (CONT.): Observed and Expected Numbers of Cancer Cases by Site and Sex

Residents of ZIP Code 60453, Illinois, 2005-2014

	White				Black			
	Males		Females		Males		Females	
Kidney	51	62	56	46	4	3	3	2
Nervous System	20	21	23	19	2	0	3	1
Hodgkin Lymphomas	10	8	7	7	0	0	0	0
Non-Hodgkin Lymphomas	82	73	55	73	5	2	3	2
Myelomas	19	21	16	20	0	1	3	2
Leukemia	51	50	39	43	2	1	2	2
All Other Sites	140	160	152*	211	10	6	7	9
Thyroid	15	19	28*	55	0	0	1	2
All Sites	1,655	1,550	1,775	1,723	93*	62	120*	83

SOURCE: Illinois State Cancer Registry, November 2016.

[a] Expected numbers are based on the age- and sex-specific incidence rates in persons in an area of Illinois with a similar population density and race distribution as the study area.

[b] Numbers do not add to total due to rounding.

* Differences between the observed and expected numbers of cases was significant at $p < .01$

APPENDIX A

SEER Site Groups for Primary Site Based on ICD-O-3/WHO 2008 Definition*^

Site Group	ICD-O-3 Site	ICD-O-3 Histology (Type)	Recode
Oral Cavity and Pharynx			
Lip	C000-C009	excluding 9050-9055, 9140, 9590-9992	20010
Tongue	C019-C029		20020
Salivary Gland	C079-C089		20030
Floor of Mouth	C040-C049		20040
Gum and Other Mouth	C030-C039, C050-C059, C060-C069		20050
Nasopharynx	C110-C119		20060
Tonsil	C090-C099		20070
Oropharynx	C100-C109		20080
Hypopharynx	C129, C130-C139		20090
Other Oral Cavity and Pharynx	C140, C142-C148		20100
Digestive System			
Esophagus	C150-C159	excluding 9050-9055, 9140, 9590-9992	21010
Stomach	C160-C169		21020
Small Intestine	C170-C179		21030
Colon and Rectum			
Colon Excluding Rectum			
Cecum	C180	excluding 9050-9055, 9140, 9590-9992	21041
Appendix	C181		21042
Ascending Colon	C182		21043
Hepatic Flexure	C183		21044
Transverse Colon	C184		21045
Splenic Flexure	C185		21046
Descending Colon	C186		21047
Sigmoid Colon	C187		21048
Large Intestine, NOS	C188-C189, C260		21049
Rectum and Rectosigmoid Junction			
Rectosigmoid Junction	C199	excluding 9050-9055, 9140, 9590-9992	21051
Rectum	C209		21052
Anus, Anal Canal and Anorectum	C210-C212, C218		21060
Liver and Intrahepatic Bile Duct			

Site Group	ICD-O-3 Site	ICD-O-3 Histology (Type)	Recode
Liver	C220	excluding 9050-9055, 9140, 9590-9992	21071
Intrahepatic Bile Duct	C221		21072
Gallbladder	C239		21080
Other Biliary	C240-C249		21090
Pancreas	C250-C259		21100
Retroperitoneum	C480		21110
Peritoneum, Omentum and Mesentery	C481-C482		21120
Other Digestive Organs	C268-C269, C488		21130
Respiratory System			
Nose, Nasal Cavity and Middle Ear	C300-C301, C310-C319	excluding 9050-9055, 9140, 9590-9992	22010
Larynx	C320-C329		22020
Lung and Bronchus	C340-C349		22030
Pleura	C384		22050
Trachea, Mediastinum and Other Respiratory Organs	C339, C381-C383, C388, C390, C398, C399		22060
Bones and Joints	**C400-C419**	**excluding 9050-9055, 9140, 9590-9992**	**23000**
Soft Tissue Including Heart	**C380, C470-C479, C490-C499**	**excluding 9050-9055, 9140, 9590-9992**	**24000**
Skin Excluding Basal and Squamous			
Melanoma of the Skin	C440-C449	8720-8790	25010
Other Non-Epithelial Skin	C440-C449	excluding 8000-8005, 8010-8046, 8050-8084, 8090-8110, 8720-8790, 9050-9055, 9140, 9590-9992	25020
Breast	**C500-C509**	**excluding 9050-9055, 9140, 9590-9992**	**26000**
Female Genital System			
Cervix Uteri	C530-C539	excluding 9050-9055, 9140, 9590-9992	27010
Corpus and Uterus, NOS			
Corpus Uteri	C540-C549	excluding 9050-9055, 9140, 9590-9992	27020
Uterus, NOS	C559		27030
Ovary	C569		27040
Vagina	C529		27050
Vulva	C510-C519		27060
Other Female Genital Organs	C570-C589		27070
Male Genital System			
Prostate	C619	excluding 9050-9055, 9140, 9590-9992	28010
Testis	C620-C629		28020
Penis	C600-C609		28030
Other Male Genital Organs	C630-C639		28040

Site Group	ICD-O-3 Site	ICD-O-3 Histology (Type)	Recode
Urinary System			
Urinary Bladder	C670-C679	excluding 9050-9055, 9140, 9590-9992	29010
Kidney and Renal Pelvis	C649, C659		29020
Ureter	C669		29030
Other Urinary Organs	C680-C689		29040
Eye and Orbit	**C690-C699**	**excluding 9050-9055, 9140, 9590-9992**	**30000**
Site Group	**ICD-O-3 Site**	**ICD-O-3 Histology (Type)**	**Recode**
Brain and Other Nervous System			
Brain	C710-C719	excluding 9050-9055, 9140, 9530-9539, 9590-9992	31010
Cranial Nerves Other Nervous System	C710-C719	9530-9539	31040
	C700-C709, C720-C729	excluding 9050-9055, 9140, 9590-9992	
Endocrine System			
Thyroid	C739	excluding 9050-9055, 9140, 9590-9992	32010
Other Endocrine Including Thymus	C379, C740-C749, C750-C759		32020
Lymphoma			
Hodgkin Lymphoma			
Hodgkin - Nodal	C024, C098-C099, C111, C142, C379, C422, C770-C779	9650-9667	33011
Hodgkin - Extranodal	All other sites		33012
Non-Hodgkin Lymphoma			
NHL - Nodal	C024, C098,C099, C111,C142, C379,C422, C770-C779	9590-9597, 9670-9671, 9673, 9675, 9678-9680, 9684, 9687-9691, 9695, 9698-9702, 9705, 9708-9709, 9712, 9714-9719, 9724-9729, 9735, 9737-9738, 9811-9818, 9823, 9827, 9837	33041
NHL - Extranodal	All sites except C024, C098-C099, C111, C142, C379, C422, C770-C779	9590-9597, 9670-9671, 9673, 9675, 9678-9680, 9684, 9687-9691, 9695, 9698-9702, 9705, 9708-9709, 9712, 9714-9719, 9724-9729, 9735, 9737-9738	33042
	All sites except C024, C098-C099, C111, C142, C379, C420-C422, C424, C770-C779	9811-9818, 9823, 9827, 9837	
Myeloma		**9731-9732, 9734**	**34000**
Leukemia			
Lymphocytic Leukemia			
Acute Lymphocytic Leukemia		9826, 9835-9836	35011
	C420, C421, C424	9811-9818, 9837	
Chronic Lymphocytic Leukemia	C420, C421, C424	9823	35012

Site Group	ICD-O-3 Site	ICD-O-3 Histology (Type)	Recode
Other Lymphocytic Leukemia		9820, 9832-9834, 9940	35013
Myeloid and Monocytic Leukemia			
Acute Myeloid Leukemia		9840, 9861, 9865-9867, 9869, 9871-9874, 9895-9897, 9898, 9910-9911, 9920	35021
Acute Monocytic Leukemia		9891	35031
Site Group	**ICD-O-3 Site**	**ICD-O-3 Histology (Type)**	**Recode**
Chronic Myeloid Leukemia		9863, 9875-9876, 9945-9946	35022
Other Myeloid/Monocytic Leukemia		9860, 9930	35023
Other Leukemia			
Other Acute Leukemia		9801, 9805-9809, 9931	35041
Aleukemic, Subleukemic and NOS		9733, 9742, 9800, 9831, 9870, 9948, 9963-9964	35043
	C420, C421, C424	9827	
Mesothelioma		**9050-9055**	**36010**
Kaposi Sarcoma		**9140**	**36020**
Miscellaneous		**9740-9741, 9750-9769, 9950, 9960-9962, 9965-9967, 9970-9971, 9975, 9980, 9982-9987, 9989, 9991-9992**	**37000**
	C760-C768, C809	**excluding 9050-9055, 9140, 9590-9992**	
	C420-C424		
	C770-C779		
Invalid	**Site or histology code not within valid range or site code not found in this table.**		**99999**

* This table was updated for Hematopoietic codes based on *WHO Classification of Tumours of Haematopoietic and Lymphoid Tissues (2008)*.
^ Subject to change based on evolving ICD-O-3 coding rules.

APPENDIX B

Site/Histology Recode Based on International Classification of Childhood Cancer, third Edition (ICCC-3) Based on ICD-O-3 / WHO 2008*^

Main Classification Table

Site Group	ICD-O-3 Site	ICD-O-3 Histology (Type)	ICD-O-3 Behavior	Extended Classification	Main Classification
I Leukemias, Myeloproliferative Diseases, and Myelodysplastic Diseases					
(a) Lymphoid Leukemias					
(a.1) Precursor Cell Leukemias	C000-C809	9835-9836	3	001	011
	C420-C421, C424	9811-9818, 9837			
(a.2) Mature B-cell Leukemias	C000-C809	9826, 9832-9833, 9940	3	002	011
	C420-C421, C424	9823			
(a.3) Mature T-cell and NK Cell Leukemias	C000-C809	9831, 9834, 9948	3	003	011
	C420-C421, C424	9827			
(a.4) Lymphoid Leukemia, NOS	C000-C809	9820	3	004	011
(b) Acute Myeloid Leukemias	C000-C809	9840, 9861, 9865-9867, 9869-9874, 9891, 9895-9898, 9910-9911, 9920, 9931	3	005	012
(c) Chronic Myeloproliferative Diseases	C000-C809	9863, 9875-9876, 9950, 9960-9964	3	006	013
(d) Myelodysplastic Syndrome and Other Myeloproliferative Diseases	C000-C809	9945-9946, 9975, 9980, 9982-9987, 9989, 9991-9992	3	007	014
(e) Unspecified and Other Specified Leukemias	C000-C809	9800-9801, 9805-9809, 9860, 9930, 9965-9967, 9971	3	008	015
II Lymphomas and Reticuloendothelial Neoplasms					
(a) Hodgkin Lymphomas	C000-C809	9650-9655, 9659, 9661-9665, 9667	3	009	021
(b) Non-Hodgkin Lymphomas (except Burkitt Lymphoma)	C000-C809	9727-9729	3	010	022
(b.1) Precursor Cell Lymphomas	C000-C419, C422-C423, C425-C809	9811-9818, 9837			

Site Group	ICD-O-3 Site	ICD-O-3 Histology (Type)	ICD-O-3 Behavior	Extended Classification	Main Classification
(b.2) Mature B-cell Lymphomas (except Burkitt Lymphoma)	C000-C809	9597, 9670-9671, 9673, 9675, 9678-9680, 9684, 9688-9691, 9695, 9698-9699, 9712, 9731-9735, 9737-9738, 9761-9762, 9764-9766, 9769, 9970	3	011	022
	C000-C419, C422-C423, C425-C809	9823			
(b.3) Mature T-cell and NK-Cell Lymphomas	C000-C809	9700-9702, 9705, 9708-9709, 9714, 9716-9719, 9724-9726, 9767-9768	3	012	022
	C000-C419, C422-C423, C425-C809	9827			
(b.4) Non-Hodgkin Lymphomas, NOS	C000-C809	9591, 9760	3	013	022
(c) Burkitt Lymphoma	C000-C809	9687	3	014	023
(d) Miscellaneous Lymphoreticular Neoplasms	C000-C809	9740-9742, 9750-9759	3	015	024
(e) Unspecified Lymphomas	C000-C809	9590, 9596	3	016	025
III CNS and Miscellaneous Intracranial and Intraspinal Neoplasms					
(a) Ependymomas and Choroid Plexus Tumor					
(a.1) Ependymomas	C000-C809	9383, 9391-9394	0,1,3	017	031
(a.2) Choroid Plexus Tumor	C000-C809	9390	0,1,3	018	031
(b) Astrocytomas	C723	9380	0,1,3	019	032
	C000-C809	9384, 9400-9411, 9420-9424, 9440-9442	0,1,3	019	032
(c) Intracranial and Intraspinal Embryonal Tumors					
(c.1) Medulloblastomas	C000-C809	9470-9472, 9474, 9480	0,1,3	020	033
(c.2) PNET	C000-C809	9473	0,1,3	021	033
(c.3) Medulloepithelioma	C700-C729	9501-9504	0,1,3	022	033
(c.4) Atypical Teratoid/Rhabdoid Tumor	C000-C809	9508	0,1,3	023	033

Site Group	ICD-O-3 Site	ICD-O-3 Histology (Type)	ICD-O-3 Behavior	Extended Classification	Main Classification
(d) Other Gliomas					
(d.1) Oligodendrogliomas	C000-C809	9450, 9451, 9460	0,1,3	024	034
(d.2) Mixed and Unspecified Gliomas	C700-C722, C724-C729, C751, C753	9380	0,1,3	025	034
	C000-C809	9382	0,1,3	025	034
(d.3) Neuroepithelial Glial Tumors of Uncertain Origin	C000-C809	9381, 9430, 9444	0,1,3	026	034
(e) Other Specified Intracranial and Intraspinal Neoplasms					
(e.1) Pituitary Adenomas and Carcinomas	C000-C809	8270-8281, 8300	0,1,3	027	035
(e.2) Tumors of the Sellar Region (Craniopharyngiomas)	C000-C809	9350-9352, 9582	0,1,3	028	035
(e.3) Pineal Parenchymal Tumors	C000-C809	9360-9362	0,1,3	029	035
(e.4) Neuronal and Mixed Neuronal-glial Tumors	C000-C809	9412-9413, 9492, 9493, 9505-9507	0,1,3	030	035
(e.5) Meningiomas	C000-C809	9530-9539	0,1,3	031	035
(f) Unspecified Intracranial and Intraspinal Neoplasms	C700-C729, C751-C753	8000-8005	0,1,3	032	036
IV Neuroblastoma and Other Peripheral Nervous Cell Tumors					
(a) Neuroblastoma and Ganglioneuroblastoma	C000-C809	9490, 9500	3	033	041
(b) Other peripheral Nervous Cell Tumors	C000-C809	8680-8683, 8690-8693, 8700, 9520-9523	3	034	042
	C000-C699, C739-C768, C809	9501-9504	3	034	042
V Retinoblastoma	**C000-C809**	**9510-9514**	**3**	**035**	**050**
VI Renal tumors					
(a) Nephroblastoma and Other Nonepithelial Renal Tumors					
(a.1) Nephroblastoma	C000-C809	8959, 8960	3	036	061
(a.2) Rhabdoid Renal Tumor	C649	8963	3	037	061
(a.3) Kidney Sarcomas	C000-C809	8964-8967	3	038	061
(a.4) pPNET of Kidney	C649	9364	3	039	061

Site Group	ICD-O-3 Site	ICD-O-3 Histology (Type)	ICD-O-3 Behavior	Extended Classification	Main Classification
(b) Renal Carcinomas	C649	8010-8041, 8050-8075, 8082, 8120-8122, 8130-8141, 8143, 8155, 8190-8201, 8210-8211, 8221-8231, 8240-8241, 8244-8246, 8260-8263, 8290, 8310, 8320, 8323, 8401, 8430, 8440, 8480-8490, 8504, 8510, 8550, 8560-8576	3	040	062
	C000-C809	8311-8312, 8316-8319, 8361	3	040	062
(c) Unspecified Malignant Renal Tumors	C649	8000-8005	3	041	063
VII Hepatic Tumors					
(a) Hepatoblastoma	C000-C809	8970	3	042	071
(b) Hepatic Carcinomas	C220, C221	8010-8041, 8050-8075, 8082, 8120-8122, 8140-8141, 8143, 8155, 8190-8201, 8210-8211, 8230, 8231, 8240-8241, 8244-8246, 8260-8264, 8310, 8320, 8323, 8401, 8430, 8440, 8480-8490, 8504, 8510, 8550, 8560-8576	3	043	072
	C000-C809	8160-8180	3	043	072
(c) Unspecified Malignant Hepatic Tumors	C220-C221	8000-8005	3	044	073
VIII Malignant Bone Tumors					
(a) Osteosarcomas	C400-C419, C760-C768, C809	9180-9187, 9191-9195, 9200	3	045	081
(b) Chondrosarcomas	C400-C419, C760-C768, C809	9210, 9220, 9240	3	046	082
	C000-C809	9221, 9230, 9241-9243	3	046	082
(c) Ewing Tumor and Related Sarcomas of Bone					
(c.1) Ewing Tumor and Askin Tumor of Bone	C400-C419, C760-C768, C809	9260	3	047	083
	C400-C419	9365	3	047	083

Site Group	ICD-O-3 Site	ICD-O-3 Histology (Type)	ICD-O-3 Behavior	Extended Classification	Main Classification
(c.2) pPNET of Bone	C400-C419	9363-9364	3	048	083
(d) Other Specified Malignant Bone Tumors					
(d.1) Malignant Fibrous Neoplasms of Bone	C400-C419	8810-8811, 8823, 8830	3	049	084
	C000-C809	8812, 9262	3	049	084
(d.2) Malignant Chordomas	C000-C809	9370-9372	3	050	084
(d.3) Odontogenic Malignant Tumors	C000-C809	9270-9275, 9280-9282, 9290, 9300-9302, 9310-9312, 9320-9322, 9330, 9340-9342	3	051	084
(d.4) Miscellaneous Malignant Bone Tumors	C000-C809	9250, 9261	3	052	084
(e) Unspecified Malignant Bone Tumors	C400-C419	8000-8005, 8800-8801, 8803-8805	3	053	085
IX Soft Tissue and Other Extraosseous Sarcomas					
(a) Rhabdomyosarcomas	C000-C809	8900-8905, 8910, 8912, 8920, 8991	3	054	091
(b) Fibrosarcomas, Peripheral Nerve Sheath Tumors, and Other Fibrous Neoplasms					
(b.1) Fibroblastic and Myofibroblastic Tumors	C000-C399, C440-C768, C809	8810-8811, 8813-8815, 8821, 8823, 8834-8835	3	055	092
	C000-C809	8820, 8822, 8824-8827, 9150, 9160	3	055	092
(b.2) Nerve Sheath Tumors	C000-C809	9540-9571	3	056	092
(b.3) Other Fibromatous Neoplasms	C000-C809	9491, 9580	3	057	092
(c) Kaposi Sarcoma	C000-C809	9140	3	058	093
(d) Other Specified Soft Tissue Sarcomas					
(d.1) Ewing Tumor and Askin Tumor of Soft Tissue	C000-C399, C470-C759	9260	3	059	094
	C000-C399, C470-C639, C659-C768, C809	9365	3	059	094
(d.2) pPNET of Soft Tissue	C000-C399, C470-C639, C659-C699, C739-C768, C809	9364	3	060	094

Site Group	ICD-O-3 Site	ICD-O-3 Histology (Type)	ICD-O-3 Behavior	Extended Classification	Main Classification
(d.3) Extrarenal Rhabdoid Tumor	C000-C639, C659-C699, C739-C768, C809	8963	3	061	094
(d.4) Liposarcomas	C000-C809	8850-8858, 8860-8862, 8870, 8880-8881	3	062	094
(d.5) Fibrohistiocytic Tumors	C000-C399, C440-C768, C809	8830	3	063	094
	C000-C809	8831-8833, 8836, 9251-9252	3	063	094
(d.6) Leiomyosarcomas	C000-C809	8890-8898	3	064	094
(d.7) Synovial Sarcomas	C000-C809	9040-9044	3	065	094
(d.8) Blood Vessel Tumors	C000-C809	9120-9125, 9130-9133, 9135-9136, 9141-9142, 9161, 9170-9175	3	066	094
(d.9) Osseous and Chondromatous Neoplasms of Soft Tissue	C490-C499	9180, 9210, 9220, 9240	3	067	094
	C000-C809	9231	3	067	094
(d.10) Alveolar Soft Parts Sarcoma	C000-C809	9581	3	068	094
(d.11) Miscellaneous Soft Tissue Sarcomas	C000-C809	8587, 8710-8713, 8806, 8840-8842, 8921, 8982, 8990, 9373	3	069	094
(e) Unspecified Soft Tissue Sarcomas	C000-C399, C440-C768, C809	8800-8805	3	070	095
X Germ Cell Tumors, Trophoblastic Tumors, and Neoplasms of Gonads					
(a) Intracranial and Intraspinal Germ Cell Tumors					
(a.1) Intracranial and Intraspinal Germinomas	C700-C729, C751-C753	9060-9065	0,1,3	071	101
(a.2) Intracranial and Intraspinal Teratomas	C700-C729, C751-C753	9080-9084	0,1,3	072	101
(a.3) Intracranial and Intraspinal Embryonal Carcinomas	C700-C729, C751-C753	9070, 9072	0,1,3	073	101
(a.4) Intracranial and Intraspinal Yolk Sac Tumor	C700-C729, C751-C753	9071	0,1,3	074	101

Site Group	ICD-O-3 Site	ICD-O-3 Histology (Type)	ICD-O-3 Behavior	Extended Classification	Main Classification
(a.5) Intracranial and Intraspinal Choriocarcinoma	C700-C729, C751-C753	9100	0,1,3	075	101
(a.6) Intracranial and Intraspinal Tumors of Mixed Forms	C700-C729, C751-C753	9085, 9101	0,1,3	076	101
(b) Malignant Extracranial and Extragonadal Germ Cell Tumors					
(b.1) Malignant Germinomas of Extracranial and Extragonadal Sites	C000-C559, C570-C619, C630-C699, C739-C750, C754-C768, C809	9060-9065	3	077	102
(b.2) Malignant Teratomas of Extracranial and Extragonadal Sites	C000-C559, C570-C619, C630-C699, C739-C750, C754-C768, C809	9080-9084	3	078	102
(b.3) Embryonal Carcinomas of Extracranial and Extragonadal Sites	C000-C559, C570-C619, C630-C699, C739-C750, C754-C768, C809	9070, 9072	3	079	102
(b.4) Yolk Sac Tumor of Extracranial and Extragonadal Sites	C000-C559, C570-C619, C630-C699, C739-C750, C754-C768, C809	9071	3	080	102
(b.5) Choriocarcinomas of Extracranial and Extragonadal Sites	C000-C559, C570-C619, C630-C699, C739-C750, C754-C768, C809	9100, 9103, 9104	3	081	102
(b.6) Other and Unspecified Malignant Mixed Germ Cell Tumors of Extracranial and Extragonadal Sites	C000-C559, C570-C619, C630-C699, C739-C750, C754-C768, C809	9085, 9101-9102, 9105	3	082	102
(c) Malignant Gonadal Germ Cell Tumors					
(c.1) Malignant Gonadal Germinomas	C569, C620-C629	9060-9065	3	083	103

Site Group	ICD-O-3 Site	ICD-O-3 Histology (Type)	ICD-O-3 Behavior	Extended Classification	Main Classification
(c.2) Malignant Gonadal Teratomas	C569, C620-C629	9080-9084, 9090-9091	3	084	103
(c.3) Gonadal Embryonal Carcinomas	C569, C620-C629	9070, 9072	3	085	103
(c.4) Gonadal Yolk Sac Tumor	C569, C620-C629	9071	3	086	103
(c.5) Gonadal Choriocarcinoma	C569, C620-C629	9100	3	087	103
(c.6) Malignant Gonadal Tumors of Mixed Forms	C569, C620-C629	9085, 9101	3	088	103
(c.7) Malignant Gonadal Gonadoblastoma	C569, C620-C629	9073	3	089	103
(d) Gonadal Carcinomas	C569, C620-C629	8010-8041, 8050-8075, 8082, 8120-8122, 8130-8141, 8143, 8190-8201, 8210-8211, 8221-8241, 8244-8246, 8260-8263, 8290, 8310, 8313, 8320, 8323, 8380-8384, 8430, 8440, 8480-8490, 8504, 8510, 8550, 8560-8573, 9000, 9014, 9015	3	090	104
	C000-C809	8441-8444, 8450-8451, 8460-8473	3	090	104
(e) Other and Unspecified Malignant Gonadal Tumors	C000-C809	8590-8671	3	091	105
	C569, C620-C629	8000-8005	3	091	105
XI Other Malignant Epithelial Neoplasms and Malignant Melanomas					
(a) Adrenocortical Carcinomas	C000-C809	8370-8375	3	092	111
(b) Thyroid Carcinomas	C739	8010-8041, 8050-8075, 8082, 8120-8122, 8130-8141, 8190, 8200-8201, 8211, 8230, 8231, 8244-8246, 8260-8263, 8290, 8310, 8320, 8323, 8430, 8440, 8480-8481, 8510, 8560-8573	3	093	112
	C000-C809	8330-8337, 8340-8347, 8350	3	093	112

Site Group	ICD-O-3 Site	ICD-O-3 Histology (Type)	ICD-O-3 Behavior	Extended Classification	Main Classification
(c) Nasopharyngeal Carcinomas	C110-C119	8010-8041, 8050-8075, 8082-8083, 8120-8122, 8130-8141, 8190, 8200-8201, 8211, 8230-8231, 8244-8246, 8260-8263, 8290, 8310, 8320, 8323, 8430, 8440, 8480-8481, 8500-8576	3	094	113
(d) Malignant Melanomas	C000-C809	8720-8780, 8790	3	095	114
(e) Skin Carcinomas	C440-C449	8010-8041, 8050-8075, 8078, 8082, 8090-8110, 8140, 8143, 8147, 8190, 8200, 8240, 8246-8247, 8260, 8310, 8320, 8323, 8390-8420, 8430, 8480, 8542, 8560, 8570-8573, 8940, 8941	3	096	115
(f) Other and Unspecified Carcinomas					
(f.1) Carcinomas of Salivary Glands	C079-C089	8010-8084, 8120-8157, 8190-8264, 8290, 8310, 8313-8315, 8320-8325, 8360, 8380-8384, 8430-8440, 8452-8454, 8480-8586, 8588-8589, 8940-8941, 8983, 9000, 9010-9016, 9020, 9030	3	097	116
(f.2) Carcinomas of Colon and Rectum	C180, C182-C189, C199, C209, C210-C218	8010-8084, 8120-8157, 8190-8264, 8290, 8310, 8313-8315, 8320-8325, 8360, 8380-8384, 8430-8440, 8452-8454, 8480-8586, 8588-8589, 8940-8941, 8983, 9000, 9010-9016, 9020, 9030	3	098	116

Site Group	ICD-O-3 Site	ICD-O-3 Histology (Type)	ICD-O-3 Behavior	Extended Classification	Main Classification
(f.3) Carcinomas of Appendix	C181	8010-8084, 8120-8157, 8190-8264, 8290, 8310, 8313-8315, 8320-8325, 8360, 8380-8384, 8430-8440, 8452-8454, 8480-8586, 8588-8589, 8940-8941, 8983, 9000, 9010-9016, 9020, 9030	3	099	116
(f.4) Carcinomas of Lung	C340-C349	8010-8084, 8120-8157, 8190-8264, 8290, 8310, 8313-8315, 8320-8325, 8360, 8380-8384, 8430-8440, 8452-8454, 8480-8586, 8588-8589, 8940-8941, 8983, 9000, 9010-9016, 9020, 9030	3	100	116
(f.5) Carcinomas of Thymus	C379	8010-8084, 8120-8157, 8190-8264, 8290, 8310, 8313-8315, 8320-8325, 8360, 8380-8384, 8430-8440, 8452-8454, 8480-8586, 8588-8589, 8940-8941, 8983, 9000, 9010-9016, 9020, 9030	3	101	116
(f.6) Carcinomas of Breast	C500-C509	8010-8084, 8120-8157, 8190-8264, 8290, 8310, 8313-8315, 8320-8325, 8360, 8380-8384, 8430-8440, 8452-8454, 8480-8586, 8588-8589, 8940-8941, 8983, 9000, 9010-9016, 9020, 9030	3	102	116

Site Group	ICD-O-3 Site	ICD-O-3 Histology (Type)	ICD-O-3 Behavior	Extended Classification	Main Classification
(f.7) Carcinomas of Cervix Uteri	C530-C539	8010-8084, 8120-8157, 8190-8264, 8290, 8310, 8313-8315, 8320-8325, 8360, 8380-8384, 8430-8440, 8452-8454, 8480-8586, 8588-8589, 8940-8941, 8983, 9000, 9010-9016, 9020, 9030	3	103	116
(f.8) Carcinomas of Bladder	C670-C679	8010-8084, 8120-8157, 8190-8264, 8290, 8310, 8313-8315, 8320-8325, 8360, 8380-8384, 8430-8440, 8452-8454, 8480-8586, 8588-8589, 8940-8941, 8983, 9000, 9010-9016, 9020, 9030	3	104	116
(f.9) Carcinomas of Eye	C690-C699	8010-8084, 8120-8157, 8190-8264, 8290, 8310, 8313-8315, 8320-8325, 8360, 8380-8384, 8430-8440, 8452-8454, 8480-8586, 8588-8589, 8940-8941, 8983, 9000, 9010-9016, 9020, 9030	3	105	116
(f.10) Carcinomas of Other Specified Sites	C000-069, C090-C109, C129-C179, C239-C339, C380-C399, C480-C488, C510-C529, C540-C549, C559, C570-C619, C630-C639, C659-C669, C680-C689, C700-C729, C750-C759	8010-8084, 8120-8157, 8190-8264, 8290, 8310, 8313-8315, 8320-8325, 8360, 8380-8384, 8430-8440, 8452-8454, 8480-8586, 8588-8589, 8940-8941, 8983, 9000, 9010-9016, 9020, 9030	3	106	116

Site Group	ICD-O-3 Site	ICD-O-3 Histology (Type)	ICD-O-3 Behavior	Extended Classification	Main Classification
(f.11) Carcinomas of Unspecified Site	C760-C768, C809	8010-8084, 8120-8157, 8190-8264, 8290, 8310, 8313-8315, 8320-8325, 8360, 8380-8384, 8430-8440, 8452-8454, 8480-8586, 8588-8589, 8940-8941, 8983, 9000, 9010-9016, 9020, 9030	3	107	116
XII Other and Unspecified Malignant Neoplasms					
(a) Other Specified Malignant Tumors					
(a.1) Gastrointestinal Stromal Tumor	C000-C809	8936	3	108	121
(a.2) Pancreatoblastoma	C000-C809	8971	3	109	121
(a.3) Pulmonary Blastoma and Pleuropulmonary Blastoma	C000-C809	8972, 8973	3	110	121
(a.4) Other Complex Mixed and Stromal Neoplasms	C000-C809	8930-8935, 8950-8951, 8974-8981	3	111	121
(a.5) Mesothelioma	C000-C809	9050-9055	3	112	121
(a.6) Other Specified Malignant Tumors	C000-C809	9110	3	113	121
	C000-C399, C470-C759	9363	3	113	121
Site Group	**ICD-O-3 Site**	**ICD-O-3 Histology (Type)**	**ICD-O-3 Behavior**	**Extended Classification**	**Main Classification**
(b) Other Unspecified Malignant Tumors	C000-C218, C239-C399, C420-C559, C570-C619, C630-C639, C659-C699, C739-C750, C754-809	8000-8005	3	114	122

* This table was updated for Hematopoietic codes based on *WHO Classification of Tumours of Haematopoietic and Lymphoid Tissues (2008)*.

^ Subject to change based on evolving ICD-O-3 coding rules.