Texas Department of State Health Services
Cancer Incidence Investigation Report of
Various Cancer Types Occurring
In Zip Codes 78384 & 78332 in
San Diego, Duval County, Texas
Over the Period 2001–2010

September 23, 2013

Background

Concern about a possible excess of cancer diagnoses in San Diego, TX, prompted the Texas Department of State Health Services (DSHS) to examine the occurrence of various cancers in zip codes 78384 in Duval County and 78332 in Jim Wells County, Texas. A local citizen contacted State Representative Ryan Guillen's office on July 9, 2013, alleging that drinking water from the San Diego Municipal Utility District (MUD) was contaminated and may be causing excess cancers among residents of the City of San Diego. On July 10, 2013, Representative Guillen referred the complaint to the Texas Commission on Environmental Quality (TCEQ), Office of Compliance and Enforcement (OCE) for response.

On July 11, 2013, TCEQ attempted, unsuccessfully, to contact the complainant and left a telephone message. The investigator then conducted a file review of all drinking water results for the San Diego MUD in the Drinking Water Watch (DWW) database from 2008 to the present. Contaminants reviewed included trihalomethanes, halo-acetic acids, coliform bacteria, inorganic compounds, pesticides, herbicides, volatile organic compounds (VOCs), lead, copper, and radionuclides. No exceedances of any maximum contaminant levels (MCLs) for primary standards were noted. However, among secondary standards, chloride and total dissolved solids (TDS) were slightly elevated at 347 mg/L and 1,160 mg/L, respectively. It was noted that the secondary standards do not pose any health risk.

On July 15, 2013, the TCEQ investigator again attempted to contact the complainant and left another telephone message. She also contacted Rudy Torres, General Manager for the San Diego MUD, who was unaware of any incident that may have contaminated the drinking water. Later that day the complainant contacted the investigator with his/her concern that the drinking water may be responsible for an alleged increased incidence of cancer in the area. The investigator discussed the results of the DWW data review and stated that there was no evidence from the historical water data to indicate an increased risk for cancer in the area. The investigator then referred the complaint to DSHS for assessing the incidence of cancer in the area.

On July 19, 2913, the TCEQ investigator contacted a TCEQ toxicologist who concurred that the matter should be referred to DSHS for further investigation. When informed that DSHS had not yet been involved but would be soon, the complainant declined to give a mailing address for any written report. A referral letter was to be sent to the Southwest Texas

Regional Manager, Cancer Registry Division of DSHS. This letter, dated August 29, 2013, was sent by certified mail and received at the TCR. It was then forwarded to the Health Assessment and Toxicology (HAT) Group on September 9, 2013, where it was physically received on September 16, 2013.

Data Source & Scope

Ideally, DSHS tries to identify a geographical unit such as a zip code or a census tract that would be most representative of the community and the immediate vicinity that is being evaluated. San Diego is a relatively small community with a 2010 census population of 4,488. It lies mostly in Duval County and has a zip code of 78384 which also covers a large area of Duval County 15-20 miles both northwest and southwest of San Diego. Consequently, this zip code may include a lot of cancer cases that have no geographical association with San Diego, *per se*. Zip code 78332, in Jim Wells County, lies immediately east of San Diego and includes the considerably larger city of Alice. The San Diego census tract (9501) also extends 15-20 miles north and south of the city. The neighboring census tract in Jim Wells County (9502) does not include Alice (which has several census tracts to itself) but extends completely around the city to include communities on the far side of that city.

Although neither zip code nor census tract analysis was considered optimal, for this investigation DSHS has elected to evaluate cancer incidence data over the 10-year period from 2001–2010 (the latest available 10-year period), for 48 leading cancer sites and for total cancers occurring in zip codes 78384 and 78332. DSHS obtains cancer incidence data from the Texas Cancer Registry (TCR), which tracks the numbers and types of new cancer cases diagnosed each year by age, race, sex, and place of residence within the State of Texas. Cancer incidence data are generally considered to be the best indicator of cancer occurrence, and these data for Texas currently meet national standards for timeliness and data quality. This report presents information on the general methods used to conduct this investigation and the results of the analysis.

Cancer Cluster Investigation Methodology

DSHS follows guidelines recommended by the Centers for Disease Control and Prevention (CDC) for investigating cancer clusters. If DSHS were to find significantly more cancer than expected, or if rare or unlikely cancers were to be found in unusual age groups, a number of factors would then be considered to determine whether a more in-depth study could potentially identify a likely cause. Very few CCIs in the United States proceed to this stage, and those that do almost invariably fail to identify a definitive cause for the apparent cluster.

According to the National Cancer Institute (NCI), a cancer cluster is a significantly greater-than-expected number of cancer cases occurring over a specified period of time among people who live or work in the same geographical area or workplace. *Cancer cluster investigations* (CCIs) only study the rates of occurrence of new cancer cases in a particular area over time and generally only use previously collected data available from the TCR. Consequently, they are only capable of answering the simple question, “Are there more cancer cases occurring in the area or population of concern than would be expected, based on

the size and demographic characteristics of that population?" It is important to note that CCIs cannot determine the likely cause of any of the cancers observed in the area of concern. Likewise, they cannot be used determine what common risk factors, specific contaminants, or exposure sources (if any) may have contributed to the observed cancer excesses (if any) in the area of concern.

Age, Race/Ethnicity, and Sex Adjustment:

Since population demographics (characteristics such as the age, race/ethnicity, and sex of those who are diagnosed with cancer) play such an important role as risk factors for many types of cancer, all of these factors must be taken into account in calculating the expected number of cancers for the area. The *expected* numbers are determined by applying the age, race/ethnicity, and sex-specific cancer incidence rates for the state to the age, race/ethnicity, and sex-specific population figures for the area of concern. Since this CCI covers the time period from 2001-2010, we have applied linear interpolation to the 2000 and 2010 Census population numbers to determine the most representative population total for the period studied. The total expected cancer cases for males and for females are then compared with the total *observed* new cancer cases diagnosed for males and for females living in the various areas under study.

Standardized Incidence Ratio:

The standardized incidence ratio (SIR) is calculated from the number of observed cases divided by the number of expected cases. When the SIR of a particular cancer is equal to 1.0, the number of observed cases is just equal to the expected number of cases, based on incidence rates in the state. When the SIR for a particular cancer is less than 1.0, there are fewer cases of that type of cancer in the area than would be expected. Conversely, an SIR greater than 1.0 indicates that there are more cases of a specific type of cancer in the area than would be expected. However, since increased or decreased rates of cancer can (and frequently do) occur by chance alone, statistical methods are used in the analysis to estimate the likelihood that the resultant SIR (whether it is greater than or less than 1.0) is due to chance. Further complicating the issue, there are many different combinations of numbers of observed and expected cases that produce the same SIR; some of these will be statistically significant, others will not (depending on the underlying numbers that generated the SIR). Consequently, the SIR alone does not tell the whole story, and it should be stated or quoted only in conjunction with its corresponding test for statistical significance (such as the 95% or 99% confidence interval).

Confidence Intervals:

In this CCI we have calculated the 99% confidence interval (CI) for each SIR. This interval defines the range of values in which we would expect the SIR to fall 99% of the time. If the upper end of the CI for a specific SIR is greater than 1.0 and the lower end is less than 1.0 (i.e., the CI "contains" or "straddles" 1.0), the SIR falls within the expected range of values, and minor (or even major) variations above or below 1.0 are considered to be *not statistically significant*. When both upper and lower ends of the CI are greater than 1.0, the SIR is said to be *significantly higher than expected* or *significantly elevated*, and when both are less than 1.0, the SIR is said to be *significantly lower than expected* or *significantly decreased*.

Confidence intervals are particularly important when trying to interpret SIRs that are based on a small number of observed cases (i.e., 1-5 cases). In these situations the SIRs may appear relatively large (i.e., 3-4 or even higher) or relatively small (i.e., 0.5 or less). However, the CIs for small numbers of observed cases are relatively wide, and even an apparently large (or small) SIR may well be not statistically significant. Wide confidence intervals (which are common when dealing with small populations, small numbers of cases, and short periods of time) reflect a greater uncertainty in the results. When the number of observed cases in the area of concern is large (10 or more cases, which happens with large populations, long time periods, and common types of cancer), the CI grows relatively narrow, and SIRs of 3-4 or even lower often turn out to be significantly higher than expected. Similarly, SIRs of 0.8–0.9 or higher combined with a narrow CI may turn out to be significantly lower than expected.

Investigation Results

Table 1 shows a list of the cancer sites that are included under the "Leading Cancer Sites" query (not in order of frequency). Tables 2–5 show the numbers of observed cases for males and females; numbers of "expected" cases; standardized incidence ratios (SIRs); and corresponding 99% CIs for the various types of cancer observed in the two zip codes covered in this investigation. Omission of a cancer site from one of these tables means that there were no cancer cases of that type reported over the 10-year time period and that the resulting SIR of 0.00 was not statistically significant.

In zip code 78384, over the period from January 1, 2001 to December 31, 2010, total cancers (all sites combined) (SIR=0.79; 99% CI= 0.63–0.97), prostate cancer (SIR=0.61; 99% CI= 0.36–0.96), and total leukemias (SIR=0.00; 99% CI= 0.00–0.95) among males were significantly lower than expected, and all other cancer subtypes were within the expected range (See Table 2). Among females in this zip code, total cancers were close to what would be expected (SIR=0.89; 99% CI= 0.71–1.10) and all cancer subtypes were also within the expected range (See Table 3).

In zip code 78332, over the period from January 1, 2001 to December 31, 2010, total cancers (all sites combined) in males were nearly exactly what would be expected (SIR=1.00; 99% CI= 0.89–1.11). Cancers of the liver and intrahepatic bile duct were significantly increased (SIR=1.69; 99% CI= 1.09–2.50), and cancers of the prostate were significantly decreased (SIR=0.79; 99% CI= 0.62–0.99) (See Table 4). Among females in the same zip code, total cancers were nearly exactly what would be expected (SIR=0.98; 99% CI= 0.87–1.09), and all other cancer subtypes were within the expected range (See Table 5).

Information on Cancer and Cancer Risk Factors

Overall, the occurrence of cancer is common, with approximately half of all men and one third of all women alive today predicted to develop some type of cancer in their lifetime.[2] In Texas, as in the rest of the United States, cancer is the second leading cause of death, claiming 22.8% of all deaths while heart disease (the leading cause) claims 28.5%.[3] Contrary to a common misconception, "cancer" is not a single disease, but many different diseases.

Different types of cancer are generally thought to have different causes, as evidenced by their diverse risk factors. Generally, if a person develops cancer, it is probably not due to one single factor but to a combination of factors that may include heredity; diet, tobacco use, and other lifestyle factors; infectious agents; chemical exposures; and radiation exposures. Although cancer clearly can impact individuals of all ages, it primarily is a disease of older persons with over one-half of cancer cases and over three-fourths of cancer deaths occurring in persons age 65 and older. Finally, it takes time for cancer to develop; a latency period of 10–40 years can go by between the exposure to a carcinogen and the development of a clinically diagnosable case of cancer.[4]

The chances of a person developing cancer as a result of exposure to an environmental contaminant are slight. Most experts agree that exposure to environmental pollution and occupational and industrial hazards account for fewer than 10% of cancer cases.[5] The Harvard Center for Cancer Prevention estimates 5% of cancer deaths are due to occupational factors, 2% to environmental pollution, and 2% to ionizing/ultraviolet radiation.[6] In contrast, the National Cancer Institute estimates that lifestyle factors such as tobacco use and diet cause 50 to 75 percent of cancer deaths.[7] Eating a healthy diet and refraining from tobacco use are the best ways to prevent many kinds of cancer. It is estimated that one-third of all cancer deaths in this country could be prevented by eliminating the use of tobacco products. Additionally, about 25 to 30 percent of the cases of several major cancers are thought to be associated with obesity and physical inactivity.[8]

Discussion

In this Cancer Incidence Investigation, the zip code most representative of San Diego would be 78384. For this zip code, all cancer cases combined and each cancer subtype were found to be within or below the expected range. Without being able to talk to the complainant, we don't know what observations may have given the impression that cancer incidence was elevated in the community, but that impression has not been borne out after careful analysis of the data.

Investigation Limitations:

Like other similar studies, this cancer cluster investigation has other limitations as well. The incidence data used for the analysis did not include cancer cases diagnosed in the years since 2010 (which have not all been completely entered into the TCR database). Also, cancer incidence data are based on residence at the time of diagnosis. It is possible that some residents who developed cancer no longer lived in the area at the time of diagnosis and thus were not included in the analyses. Offsetting this, is the possibility that some individuals may have recently moved into the area and then developed a cancer that could not be related to any local environmental factors. These cases are included in the investigation and could artificially inflate the numbers for the study area. Finally, this investigation involved a large number of comparisons (observed and expected pairs). In such cases, it is not uncommon to see one or more statistically significant results, simply as a result of chance alone.

Conclusions

The preponderance of evidence in this investigation does not support a conclusion that anything out of the ordinary is occurring in zip code 78384 or 78332 with respect to cancer incidence.

Recommendations

Based on the findings and the information discussed above, a more in-depth epidemiologic study of cancers in zip codes 78384 and 78332 is not recommended at this time.

Additional Information

For additional information about cancer, visit the "Resources" link on the DSHS Web site at http://www.dshs.state.tx.us/tcr/.

Questions or comments regarding this investigation may be directed to Richard A. Beauchamp, M.D., Senior Medical Toxicologist, Exposure Assessment, Surveillance, and Toxicology Group at 512-776-6434, email: Richard.Beauchamp@dshs.state.tx.us.

References

1. Guidelines for Investigating Clusters of Health Events, Centers for Disease Control and Prevention, MMWR 1990; 39 (RR-11): 1-16.

2. American Cancer Society Website: http://www.cancer.org/cancer/cancerbasics/what-is-cancer. Retrieved 06/10/13.

3. Cancer Statistics, 2005. CA, Cancer Journal for Clinicians. 2005: 55:10-30. Available online: http://onlinelibrary.wiley.com/doi/10.3322/canjclin.55.1.10/abstract. Retrieved 06/10/13.

4. National Cancer Institute Website: http://www.cancer.gov/cancertopics/factsheet/Risk/clusters. Retrieved 06/10/13.

5. Cancer: What Causes It, What Doesn't. Published by the American Cancer Society, 2003. Available at the American Cancer Society Website: http://acs.bookstore.ipgbook.com/cancer--what-causes-it--what-doesn-t-products-9780944235447.php?page_id=32&pid=ACN.

6. Harvard Reports on Cancer Prevention. Harvard Center for Cancer Prevention. Volume 1: Human Causes of Cancer. Harvard School of Public Health Website: http://www.health.harvard.edu/newsletters/Harvard_Mens_Health_Watch/2009/April/The-10-commandments-of-cancer-prevention.

7. Cancer Trends Progress Report – 2005 Update. National Cancer Institute Website: http://progressreport.cancer.gov/2005/doc.asp?pid=1&did=2005&mid=vcol&chid=21.

8. Cancer and the Environment. Published by the National Cancer Institute (NCI) and the National Institute on Environmental Health Sciences, 2003. http://www.niehs.nih.gov/health/materials/cancer_and_the_environment_508.pdf.

Table 1. List of 49 Leading Sites Analyzed in This Cancer Incidence Investigation

Site #	Cancer Site/Morphology	Site #	Cancer Site/Morphology
1	All Sites	26	Ovary
2	Oral Cavity and Pharynx	27	Vagina
3	Esophagus	28	Vulva
4	Stomach	29	Prostate
5	Small Intestine	30	Testis
6	Colon and Rectum	31	Penis
7	Anus, Anal Canal and Anorectum	32	Urinary Bladder
8	Liver and Intrahepatic Bile Duct	33	Kidney and Renal Pelvis
9	Gallbladder	34	Ureter
10	Pancreas	35	Eye and Orbit
11	Retroperitoneum	36	Brain and Other Nervous System
12	Peritoneum, Omentum and Mesentery	37	Thyroid
13	Respiratory System	38	Hodgkin Lymphoma
14	Nose, Nasal Cavity and Middle Ear	39	Non-Hodgkin Lymphoma
15	Larynx	40	Myeloma
16	Lung and Bronchus	41	Leukemia
17	Pleura	42	Acute Lymphocytic Leukemia
18	Trachea, Mediastinum & Other Respiratory Organs	43	Chronic Lymphocytic Leukemia
19	Bones and Joints	44	Acute Myeloid Leukemia
20	Soft Tissue Including Heart	45	Acute Monocytic Leukemia
21	Skin Excluding Basal and Squamous	46	Chronic Myeloid Leukemia
22	Melanoma of the Skin	47	Aleukemic, Subleukemic and NOS
23	Breast	48	Mesothelioma
24	Cervix Uteri	49	Kaposi Sarcoma
25	Corpus and Uterus, NOS		

Table 2. Numbers of Observed and Expected Male Cancer Cases, Standardized Incidence Ratios (SIRs), and 99% Confidence Intervals (CIs) for Leading Cancer Sites in Zip Code 78384, San Diego, TX, 2001–2010, Reference Population: Texas

	Males				
Site #	**Cancer Site/Morphology**	**Observed**	**Expected**	**SIR**	**99% CI**
1	**All Sites**	**142**	**180.22**	**0.79****	**0.63 - 0.97**
2	Oral Cavity and Pharynx	1	4.28	0.23	0.00 - 1.74
3	Esophagus	4	2.24	1.78	0.30 - 5.62
4	Stomach	1	5.62	0.18	0.00 - 1.32
6^	Colon and Rectum	22	20.59	1.07	0.57 - 1.81
7	Anus, Anal Canal and Anorectum	2	0.33	6.14	0.32 - 28.45
8	Liver and Intrahepatic Bile Duct	7	8.53	0.82	0.24 - 2.01
10	Pancreas	4	4.88	0.82	0.14 - 2.58
13	Respiratory System	23	25.26	0.91	0.50 - 1.52
15	Larynx	8	2.58	3.10	0.99 - 7.19
16	Lung and Bronchus	15	22.23	0.67	0.31 - 1.27
20	Soft Tissue Including Heart	3	1.36	2.20	0.25 - 8.06
21	Skin Excluding Basal and Squamous	1	2.89	0.35	0.00 - 2.57
22	Melanoma of the Skin	1	2.52	0.40	0.00 - 2.95
29	**Prostate**	**29**	**47.74**	**0.61****	**0.36 - 0.96**
31	Penis	1	0.71	1.41	0.01 - 10.49
32	Urinary Bladder	5	7.57	0.66	0.14 - 1.87
33	Kidney and Renal Pelvis	8	9.84	0.81	0.26 - 1.89
36	Brain and Other Nervous System	5	2.63	1.90	0.41 - 5.37
37	Thyroid	2	1.75	1.15	0.06 - 5.31
39	Non-Hodgkin Lymphoma	5	8.00	0.63	0.13 - 1.77
40	Myeloma	3	2.99	1.00	0.11 - 3.67
41	**Leukemia**	**0**	**5.58**	**0.00****	**0.00 - 0.95**
48	Mesothelioma	3	0.51	5.94	0.67 - 21.74

*Significantly higher than expected at the p< 0.01 level.
**Significantly lower than expected at the p< 0.01 level.
^ Skipped Site #s means that there were no reported cancers of that type and the result was not statistically significant.

Table 3. Numbers of Observed and Expected Female Cancer Cases, Standardized Incidence Ratios (SIRs), and 99% Confidence Intervals (CIs) for Leading Cancer Sites in Zip Code 78384, San Diego, TX, 2001–2010, Reference Population: Texas

	Females				
Site #	**Cancer Site/Morphology**	**Observed**	**Expected**	**SIR**	**99% CI**
1	All Sites	146	164.43	0.89	0.71 - 1.10
2	Oral Cavity and Pharynx	1	1.86	0.54	0.00 - 3.99
4^	Stomach	3	4.37	0.69	0.08 - 2.51
5	Small Intestine	1	0.88	1.14	0.01 - 8.48
6	Colon and Rectum	11	16.58	0.66	0.26 - 1.37
7	Anus, Anal Canal and Anorectum	1	0.51	1.97	0.01 - 14.65
8	Liver and Intrahepatic Bile Duct	2	4.35	0.46	0.02 - 2.13
9	Gallbladder	3	1.53	1.96	0.22 - 7.17
10	Pancreas	10	5.32	1.88	0.70 - 4.02
13	Respiratory System	11	15.72	0.70	0.27 - 1.45
16	Lung and Bronchus	11	15.07	0.73	0.29 - 1.51
19	Bones and Joints	1	0.39	2.56	0.01 - 19.05
20	Soft Tissue Including Heart	2	1.19	1.68	0.09 - 7.77
21	Skin Excluding Basal and Squamous	1	2.25	0.44	0.00 - 3.30
22	Melanoma of the Skin	1	1.91	0.52	0.00 - 3.89
23	Breast	43	42.25	1.02	0.66 - 1.49
24	Cervix Uteri	8	5.32	1.50	0.48 - 3.49
25	Corpus and Uterus, NOS	8	8.46	0.95	0.30 - 2.19
26	Ovary	6	5.53	1.09	0.28 - 2.83
28	Vulva	1	0.89	1.12	0.01 - 8.31
32	Urinary Bladder	2	2.57	0.78	0.04 - 3.61
33	Kidney and Renal Pelvis	7	7.00	1.00	0.29 - 2.45
37	Thyroid	6	5.93	1.01	0.26 - 2.64
38	Hodgkin Lymphoma	1	0.91	1.10	0.01 - 8.16
39	Non-Hodgkin Lymphoma	4	7.85	0.51	0.09 - 1.60
40	Myeloma	2	2.63	0.76	0.04 - 3.53
41	Leukemia	6	4.55	1.32	0.34 - 3.44
42	Acute Lymphocytic Leukemia	2	0.93	2.16	0.11 - 10.02
44	Acute Myeloid Leukemia	2	1.21	1.65	0.09 - 7.63
47	Aleukemic, Subleukemic and NOS	2	0.31	6.52	0.34 - 30.23

*Significantly higher than expected at the p< 0.01 level.
**Significantly lower than expected at the p< 0.01 level.
^ Skipped Site #s means that there were no reported cancers of that type and the result was not statistically significant.

Table 4. Numbers of Observed and Expected Male Cancer Cases, Standardized Incidence Ratios (SIRs), and 99% Confidence Intervals (CIs) for Leading Cancer Sites in Zip Code 78332, San Diego, TX, 2001–2010, Reference Population: Texas

	Males				
Site #	**Cancer Site/Morphology**	**Observed**	**Expected**	**SIR**	**99% CI**
1	All Sites	590	592.06	1.00	0.89 - 1.11
2	Oral Cavity and Pharynx	17	15.34	1.11	0.54 - 2.01
3	Esophagus	9	7.62	1.18	0.41 - 2.62
4	Stomach	17	15.77	1.08	0.52 - 1.95
5	Small Intestine	2	2.55	0.78	0.04 - 3.64
6	Colon and Rectum	70	65.53	1.07	0.77 - 1.44
8^	**Liver and Intrahepatic Bile Duct**	**41**	**24.21**	**1.69***	**1.09 - 2.50**
10	Pancreas	11	15.39	0.71	0.28 - 1.48
13	Respiratory System	88	87.61	1.00	0.75 - 1.31
14	Nose, Nasal Cavity and Middle Ear	3	0.99	3.03	0.34 - 11.10
15	Larynx	8	8.33	0.96	0.31 - 2.23
16	Lung and Bronchus	76	77.86	0.98	0.71 - 1.30
18	Trachea, Mediastinum & Other Respiratory Organs	1	0.39	2.53	0.01 - 18.82
19	Bones and Joints	2	1.55	1.29	0.07 - 5.98
20	Soft Tissue Including Heart	4	4.37	0.91	0.15 - 2.88
21	Skin Excluding Basal and Squamous	13	13.53	0.96	0.41 - 1.88
22	Melanoma of the Skin	13	12.13	1.07	0.46 - 2.10
29	**Prostate**	**124**	**157.12**	**0.79****	**0.62 - 0.99**
30	Testis	9	6.31	1.43	0.50 - 3.17
31	Penis	2	1.98	1.01	0.05 - 4.69
32	Urinary Bladder	29	27.51	1.05	0.62 - 1.67
33	Kidney and Renal Pelvis	32	30.92	1.03	0.62 - 1.61
35	Eye and Orbit	3	0.89	3.38	0.38 - 12.35
36	Brain and Other Nervous System	9	8.97	1.00	0.35 - 2.23
37	Thyroid	4	5.76	0.69	0.12 - 2.19
38	Hodgkin Lymphoma	3	3.62	0.83	0.09 - 3.03
39	Non-Hodgkin Lymphoma	29	25.91	1.12	0.66 - 1.77
40	Myeloma	10	9.34	1.07	0.40 - 2.29
41	Leukemia	12	19.20	0.62	0.26 - 1.26
42	Acute Lymphocytic Leukemia	4	3.64	1.10	0.18 - 3.46
43	Chronic Lymphocytic Leukemia	3	5.25	0.57	0.06 - 2.09
44	Acute Myeloid Leukemia	4	4.86	0.82	0.14 - 2.59
48	Mesothelioma	2	1.74	1.15	0.06 - 5.34
49	Kaposi Sarcoma	2	1.45	1.38	0.07 - 6.42

*Significantly higher than expected at the p< 0.01 level.
**Significantly lower than expected at the p< 0.01 level.
^ Skipped Site #s means that there were no reported cancers of that type and the result was not statistically significant.

Table 5. Numbers of Observed and Expected Female Cancer Cases, Standardized Incidence Ratios (SIRs), and 99% Confidence Intervals (CIs) for Leading Cancer Sites in Zip Code 78332, San Diego, TX, 2001–2010, Reference Population: Texas

	Females				
Site #	**Cancer Site/Morphology**	**Observed**	**Expected**	**SIR**	**99% CI**
1	All Sites	534	546.12	0.98	0.87 - 1.09
2	Oral Cavity and Pharynx	5	6.57	0.76	0.16 - 2.15
3	Esophagus	3	2.18	1.37	0.15 - 5.03
4	Stomach	16	11.75	1.36	0.64 - 2.51
5	Small Intestine	1	2.69	0.37	0.00 - 2.76
6	Colon and Rectum	63	53.52	1.18	0.83 - 1.62
7	Anus, Anal Canal and Anorectum	1	1.79	0.56	0.00 - 4.14
8	Liver and Intrahepatic Bile Duct	12	11.21	1.07	0.44 - 2.15
9	Gallbladder	4	4.06	0.98	0.17 - 3.10
10	Pancreas	20	15.67	1.28	0.66 - 2.21
13^	Respiratory System	56	56.33	0.99	0.69 - 1.39
14	Nose, Nasal Cavity and Middle Ear	1	0.69	1.46	0.01 - 10.82
16	Lung and Bronchus	55	54.08	1.02	0.70 - 1.43
19	Bones and Joints	2	1.34	1.49	0.08 - 6.92
20	Soft Tissue Including Heart	5	3.89	1.28	0.28 - 3.64
21	Skin Excluding Basal and Squamous	9	9.68	0.93	0.32 - 2.07
22	Melanoma of the Skin	8	8.55	0.94	0.30 - 2.17
23	Breast	147	149.84	0.98	0.79 - 1.21
24	Cervix Uteri	15	17.47	0.86	0.39 - 1.61
25	Corpus and Uterus, NOS	36	28.99	1.24	0.77 - 1.88
26	Ovary	16	18.25	0.88	0.41 - 1.62
27	Vagina	2	1.25	1.60	0.08 - 7.43
28	Vulva	3	2.73	1.10	0.12 - 4.02
32	Urinary Bladder	8	8.66	0.92	0.30 - 2.14
33	Kidney and Renal Pelvis	17	21.70	0.78	0.38 - 1.42
36	Brain and Other Nervous System	7	7.87	0.89	0.26 - 2.18
37	Thyroid	17	20.76	0.82	0.40 - 1.48
38	Hodgkin Lymphoma	4	3.03	1.32	0.22 - 4.15
39	Non-Hodgkin Lymphoma	22	24.92	0.88	0.47 - 1.49
40	Myeloma	4	8.04	0.50	0.08 - 1.57
41	Leukemia	11	15.56	0.71	0.28 - 1.46
42	Acute Lymphocytic Leukemia	1	3.10	0.32	0.00 - 2.40
43	Chronic Lymphocytic Leukemia	2	3.94	0.51	0.03 - 2.35
44	Acute Myeloid Leukemia	3	4.14	0.72	0.08 - 2.65
46	Chronic Myeloid Leukemia	4	2.06	1.94	0.33 - 6.12
47	Aleukemic, Subleukemic and NOS	1	1.00	1.00	0.00 - 7.39

*Significantly higher than expected at the p< 0.01 level.
**Significantly lower than expected at the p< 0.01 level.
^ Skipped Site #s means that there were no reported cancers of that type and the result was not statistically significant.