
Cancer in Carlsbad, California 1996 – 2008

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Overview

- ▶ About the California Cancer Registry
- ▶ Cancer Concern Analysis Methods
- ▶ Carlsbad Cancer Concern Analysis
- ▶ Results
- ▶ Discussion
- ▶ Summary
- ▶ Next Steps

Cancer in California

- ▶ >2 of 5 Californians will develop a cancer during their lifetime
- ▶ >1 of 5 Californians will die from cancer
- ▶ >1 million Californians alive today have a history of cancer diagnosis

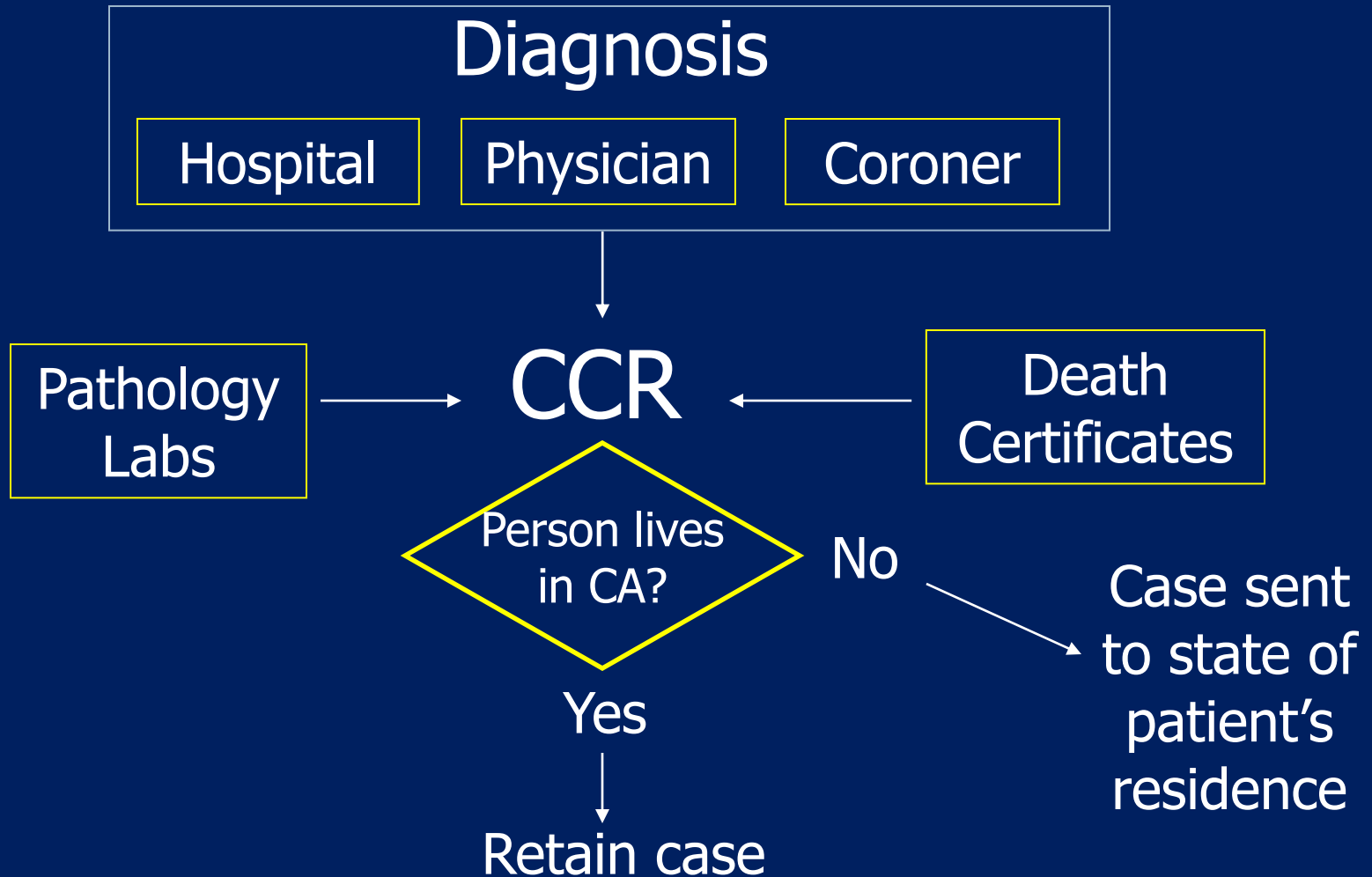
California Cancer Registry (CCR)

- ▶ CA's statewide population-based cancer registry
- ▶ Established by CA Legislature in 1985
 - ▶ Statewide reporting since January 1, 1988
 - ▶ Medical facilities and physicians must report cancer cases to CCR within 6 months
- ▶ >3 million cases collected
- ▶ >160,000 new cases added each year

CCR Mission

- ▶ **To serve the public by**
 - ▶ **Collecting statewide data**
 - ▶ **Conducting surveillance and research into the causes, controls, and cures of cancer**
 - ▶ **Communicating results to the public**

CCR Case Reporting & Processing



Why are CCR Data 18 Months Behind?

- ▶ Most cases reported to CCR within 12 months of diagnosis
 - ▶ Do not publish data until $\geq 95\%$ cases reported
 - ▶ Complete case information may not be available until 6 months after diagnosis

Why are CCR Data 18 Months Behind?

- ▶ Last 10% of cases hardest to complete
 - ▶ Many cancer patients now diagnosed and treated in doctors' offices and never admitted to hospital
 - ▶ More effort required to find these cases
- ▶ Strict quality control procedures needed to produce complete and accurate data
- ▶ Data usually ready within 18 months

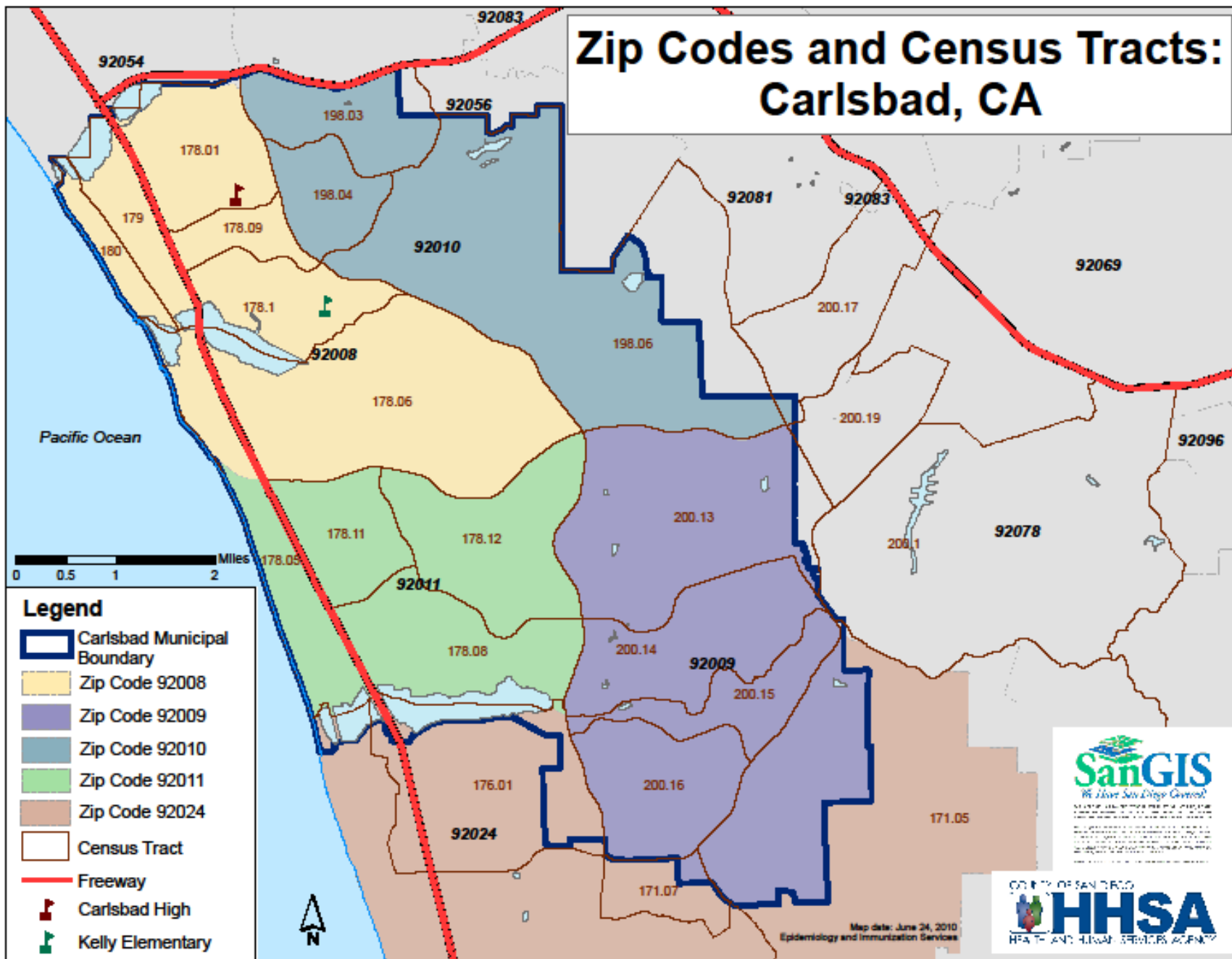
CCR Cancer Concern Analysis Methods

- ▶ Define Geographic Area
- ▶ Review Observed Cases
 - ▶ Population, Years Included, Cancer Types
- ▶ Determine Number of Expected Cases
 - ▶ California statewide cancer rates
 - ▶ Population data for geographic area
- ▶ Compared Observed and Expected Numbers
- ▶ Communicate Results

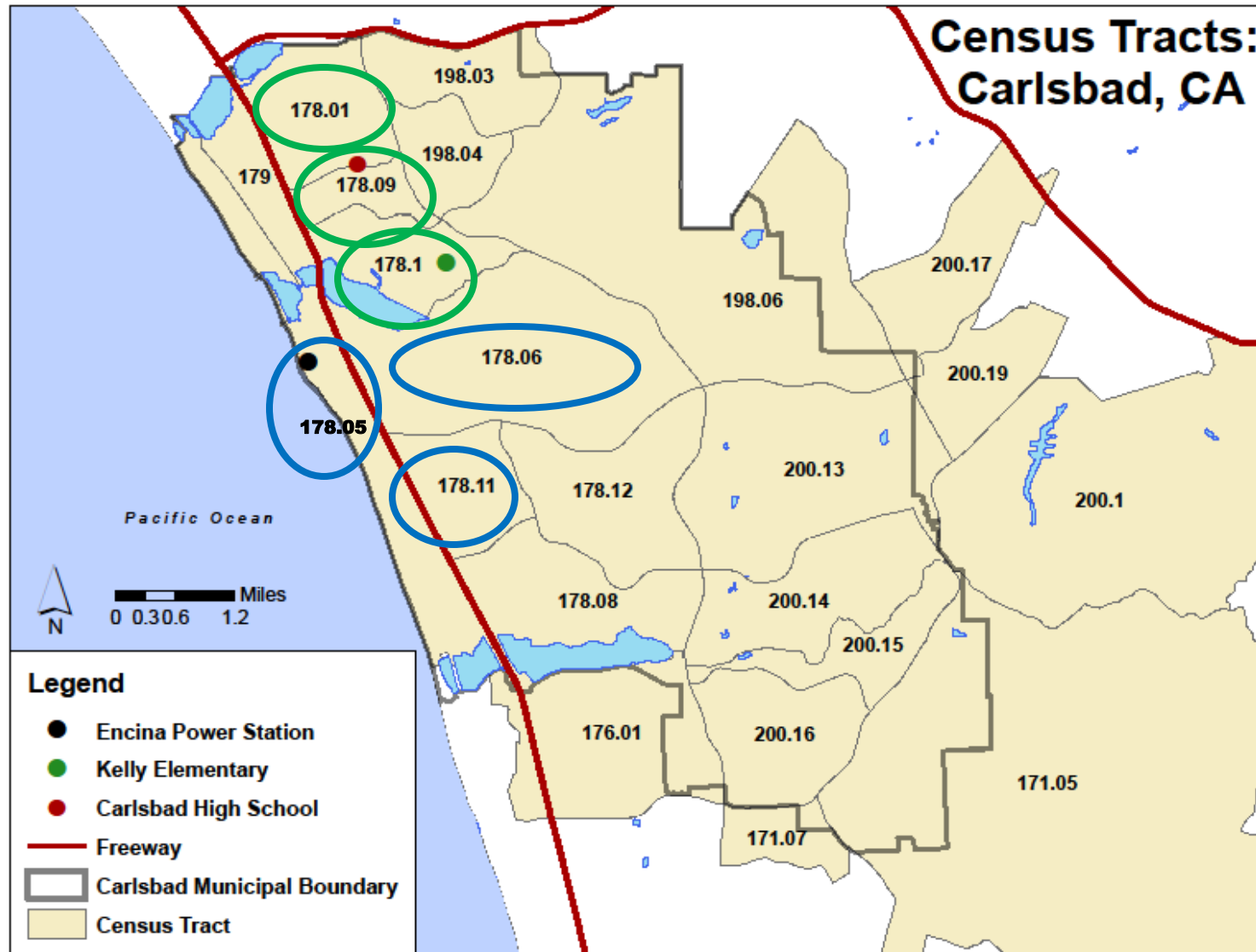
Carlsbad Cancer Concern

- ▶ Community concerned about number of cancers in areas near
 - ▶ Encina Power Station
 - ▶ Census Tracts (CTs) 178.05, 178.06, 178.11
 - ▶ Kelly Elementary and Carlsbad High Schools
 - ▶ CTs 178.01, 178.09, 178.10
- ▶ Concern about pesticides and heavy metals in soil from former farmland

Zip Codes and Census Tracts: Carlsbad, CA



Map of Carlsbad Census Tracts



CCR Analysis for Carlsbad

- ▶ **All new cancer cases from 1996-2008**
 - ▶ Separate analyses for each of
 - ▶ 3 CTs near schools of concern
 - ▶ 3 CTs near Encina Power Station
 - ▶ Combined analysis for
 - ▶ 23 CTs covering all of Carlsbad
- ▶ **Comparison data**
 - ▶ Census 2000 population data for 1996-2004
 - ▶ San Diego County population estimates for 2005-2008
 - ▶ California statewide cancer rates

Cancer Sites Reported in CCR Analysis (requested by SD County)

- ▶ All Cancer Sites Combined
- ▶ Brain and Central Nervous System (CNS)
- ▶ Female Breast
- ▶ Colorectal
- ▶ Acute Lymphocytic Leukemia (ALL)
- ▶ Acute Myeloid Leukemia (AML)
- ▶ Non-Hodgkin Lymphoma (NHL)
- ▶ Lung and bronchus
- ▶ Prostate
- ▶ Soft Tissue (Sarcomas)
- ▶ Malignant Melanoma of the Skin

Other Cancer Sites Reviewed in CCR Analysis

- ▶ Bladder
- ▶ Cervix
- ▶ Esophagus
- ▶ Hodgkin Lymphoma
- ▶ Kaposi Sarcoma
- ▶ Kidney
- ▶ Larynx
- ▶ Leukemia (all types)
- ▶ Chronic Lymphocytic Leukemia
- ▶ Chronic Myeloid Leukemia
- ▶ Liver
- ▶ Myeloma
- ▶ Oral Cavity and Pharynx
- ▶ Pancreas
- ▶ Stomach
- ▶ Testis
- ▶ Thyroid
- ▶ Uterus

CCR Analysis Methods

Are the number of cases observed more than what would be expected for a group of similar size, race/ethnicity mix, and age structure?

CCR Analysis Methods

- ▶ Compare observed number of cases to expected number for similar groups
 - ▶ Observed = # new cases reported in CTs from 1996 to 2008
 - ▶ Expected = Average # new cases in the CTs based on rates for all of California
- ▶ 99% Confidence Intervals
 - ▶ Range of numbers consistent with average
 - ▶ Is difference statistically significant - higher or lower than expected?

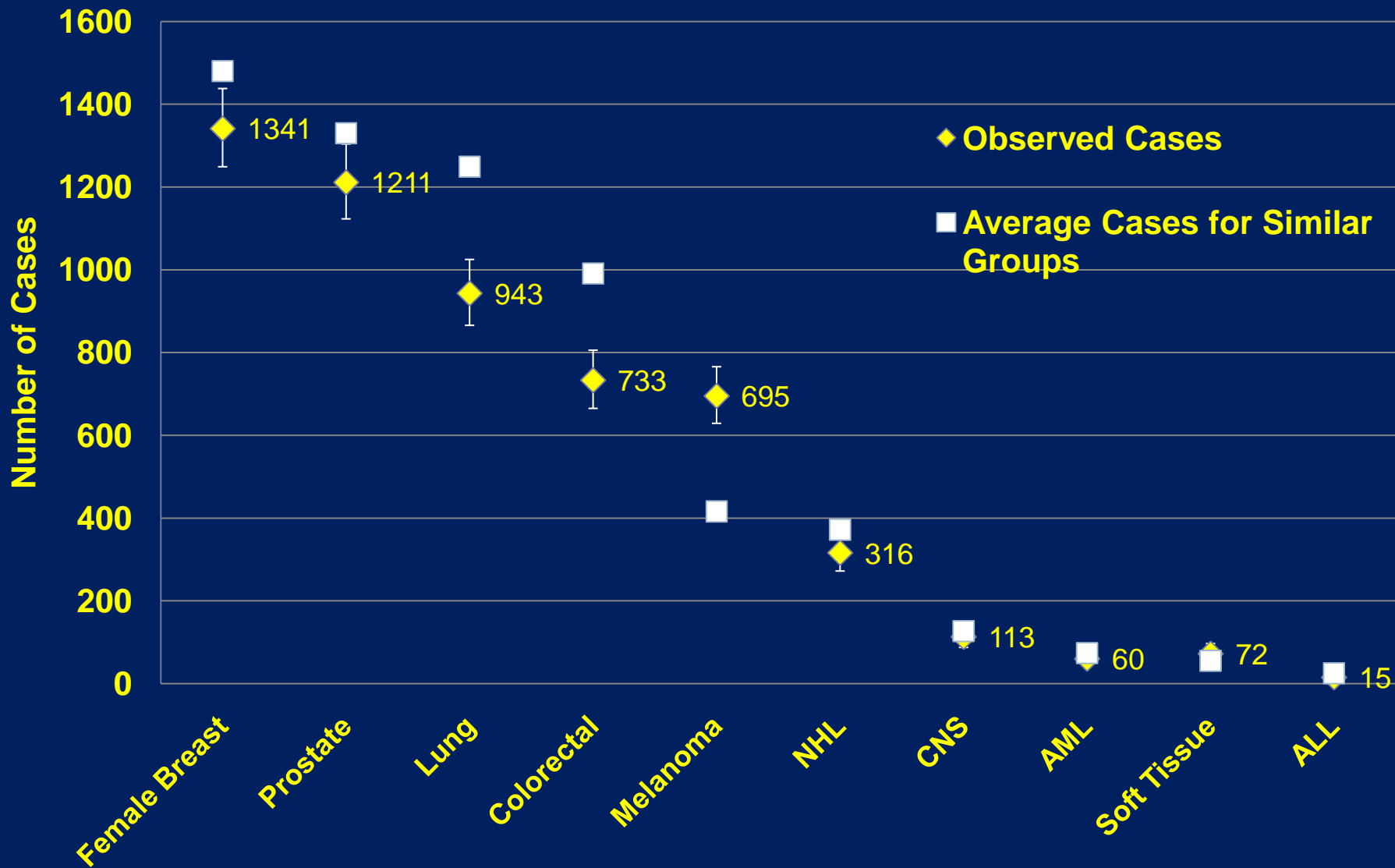
Case Verification for Carlsbad Community Survey

- ▶ For each case
 - ▶ Review all information submitted
 - ▶ Search for case in CCR database
- ▶ For cases not found, document why
 - ▶ No name given
 - ▶ Diagnosed before 1988 (when CCR began)
 - ▶ Diagnosed late 2009/early 2010 (not yet reported)
- ▶ Count each case only once
 - ▶ Some people on community list > one time

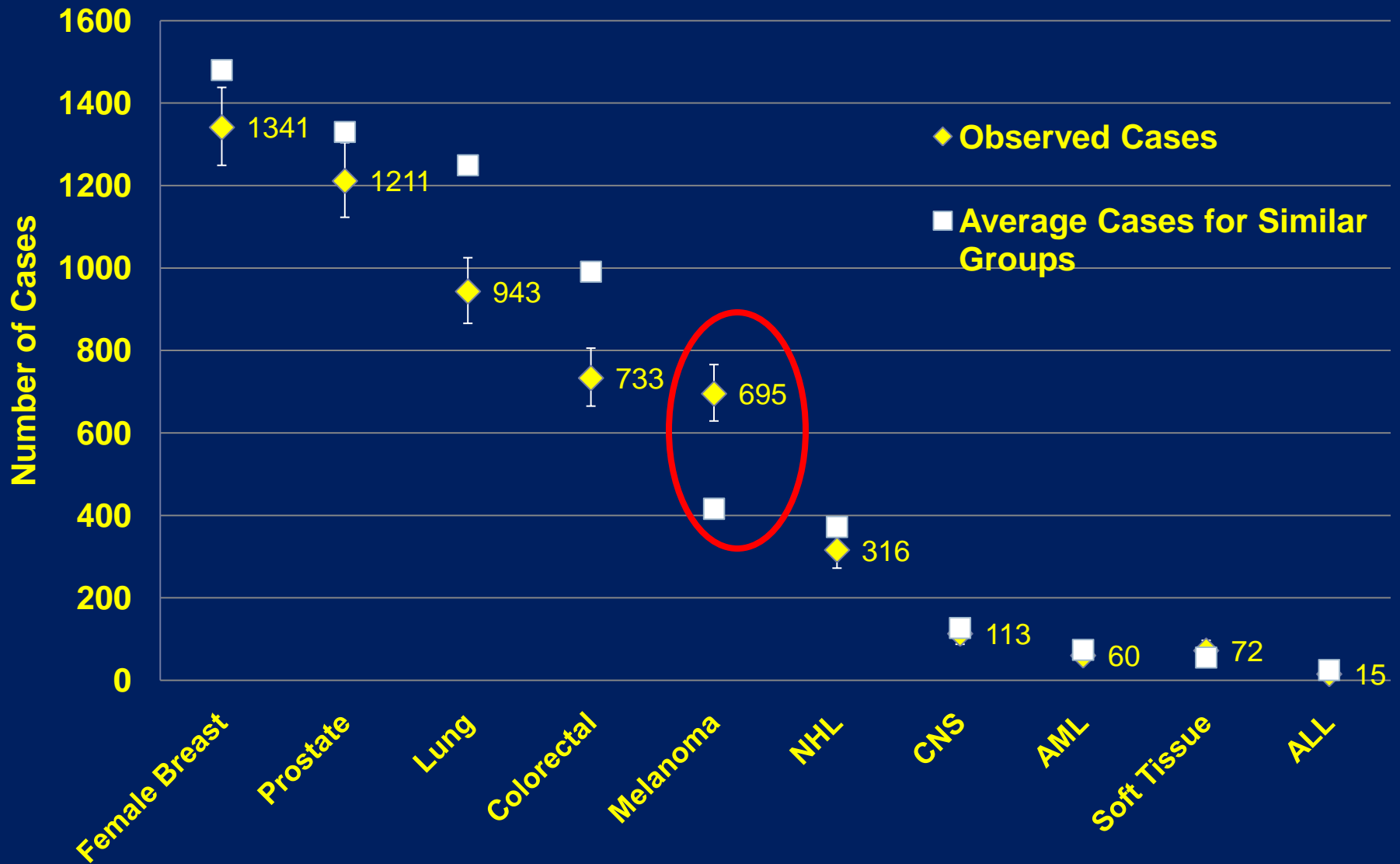
Results

- ▶ Charts show number of observed cases and average number expected for similar groups
- ▶ **CCR must protect patient confidentiality**
 - ▶ Do not show specific CTs for cancers with <5 cases
 - ▶ CTs numbered 1 to 6 so can show number of cases
 - ▶ CTs presented in random order for these cancers
 - ▶ Cannot provide maps of case locations

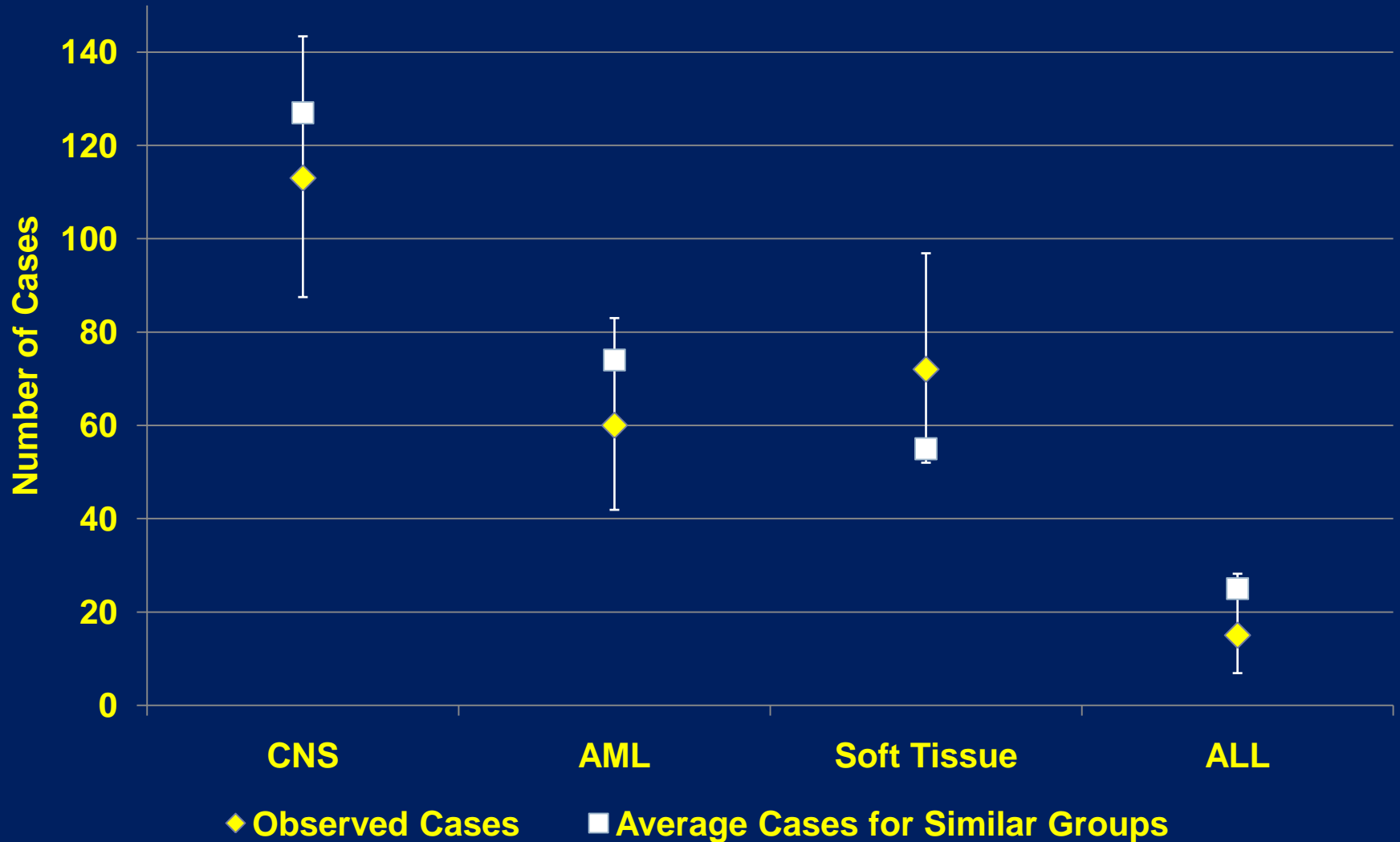
New Cancer Cases by Cancer Site, 23 Carlsbad Census Tracts, 1996-2008



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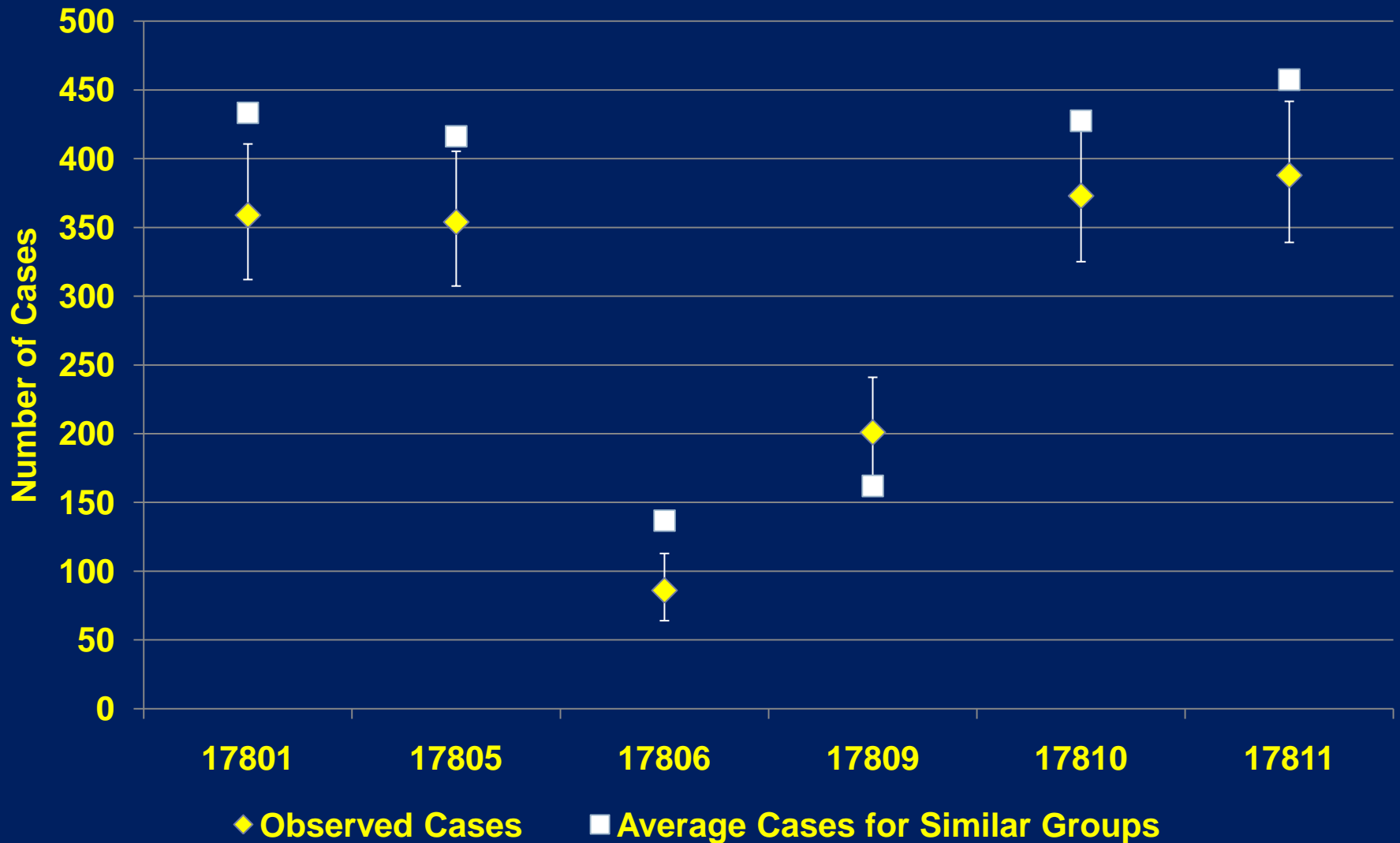
New Cancer Cases by Cancer Site, 23 Carlsbad Census Tracts, 1996-2008



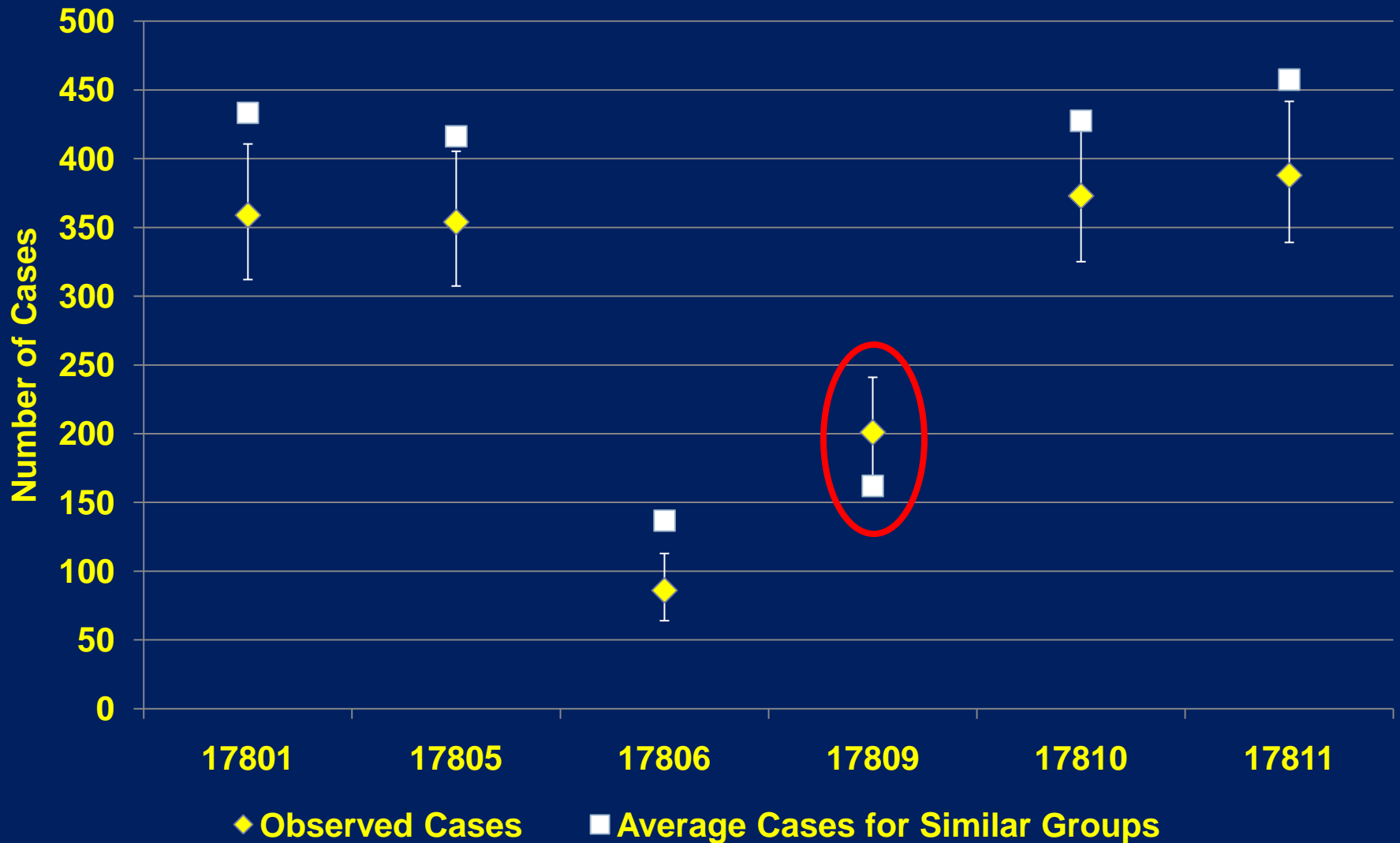
New Cancer Cases by Cancer Site and Age, 23 Carlsbad Census Tracts, 1996-2008

Cancer Type and Age Group	Number of Observed Cases	Average Cases for Similar Groups	Range of Cases Consistent with Average	
			Smallest	Largest
Acute Lymphocytic Leukemia				
0-14 Years	9	13	3	20
15-19 Years	<5	2	0	9
Acute Myeloid Leukemia				
0-14 Years	<5	2	0	9
15-19 Years	<5	0	0	5
Non-Hodgkin Lymphoma				
0-14 Years	<5	3	0	9
15-19 Years	<5	2	0	7

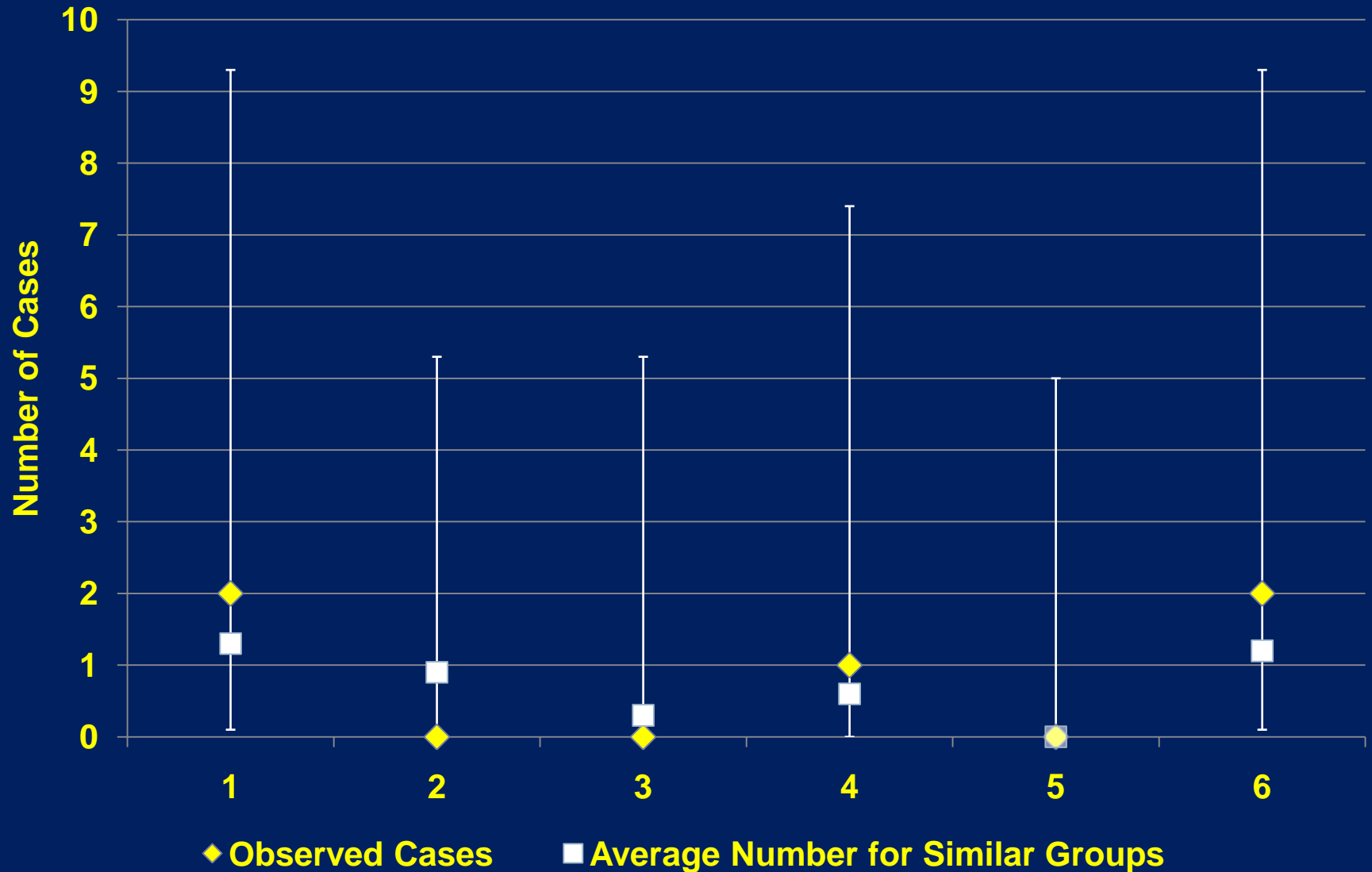
New Cancer Cases by CT, All Sites Combined, 1996-2008



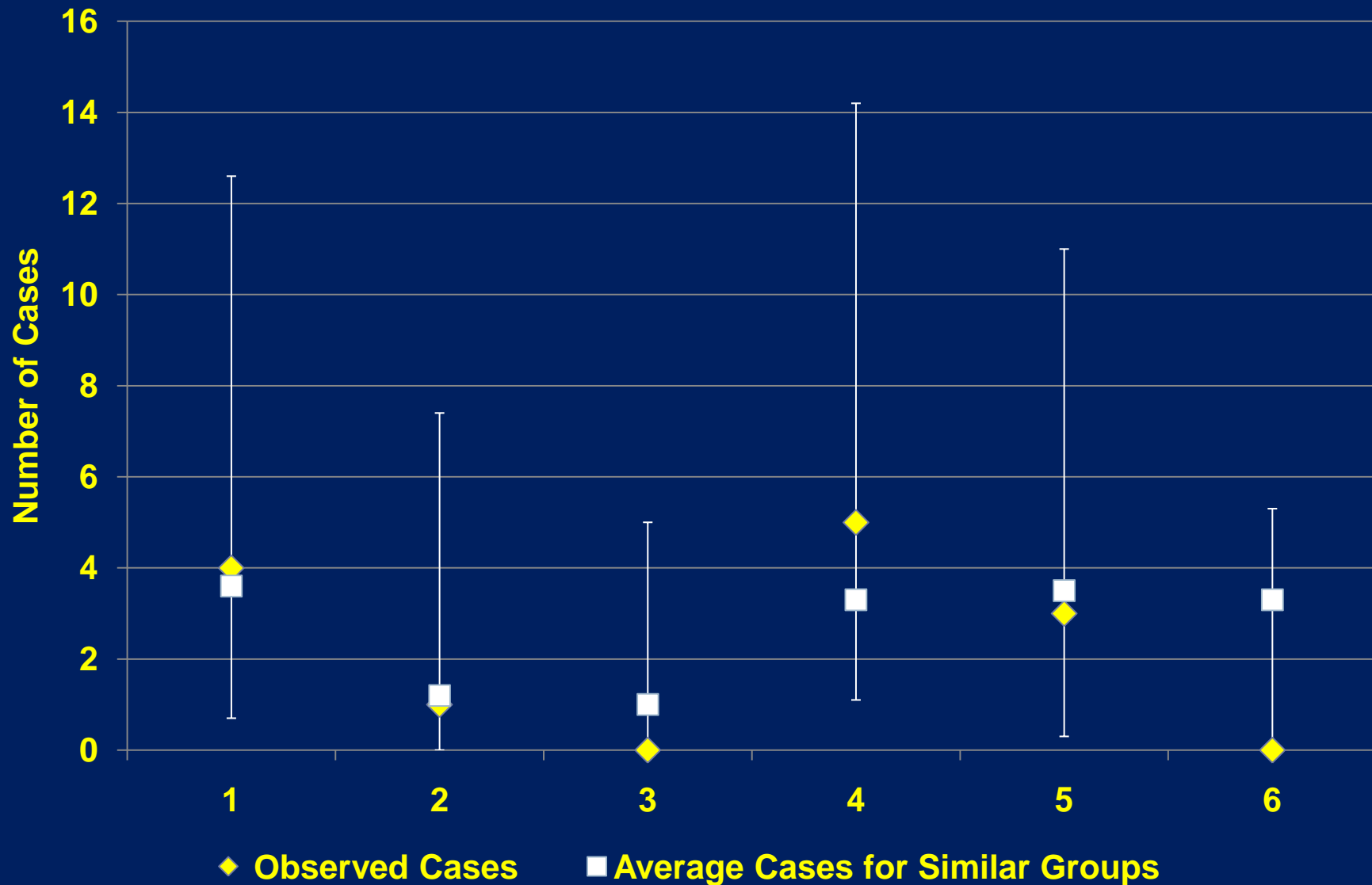
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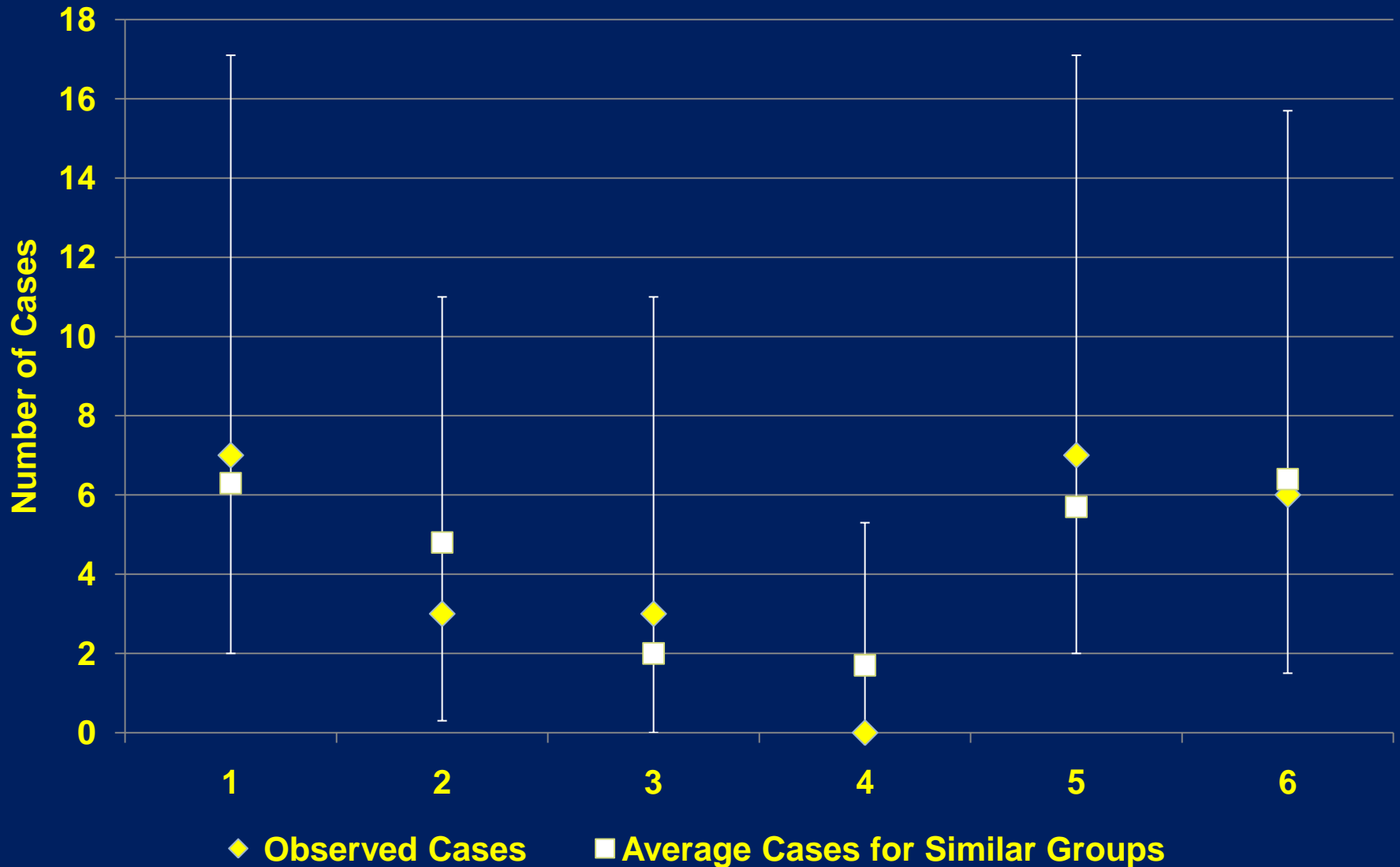
New Acute Lymphocytic Leukemia (ALL) Cases by Census Tract, Carlsbad, California, 1996-2008



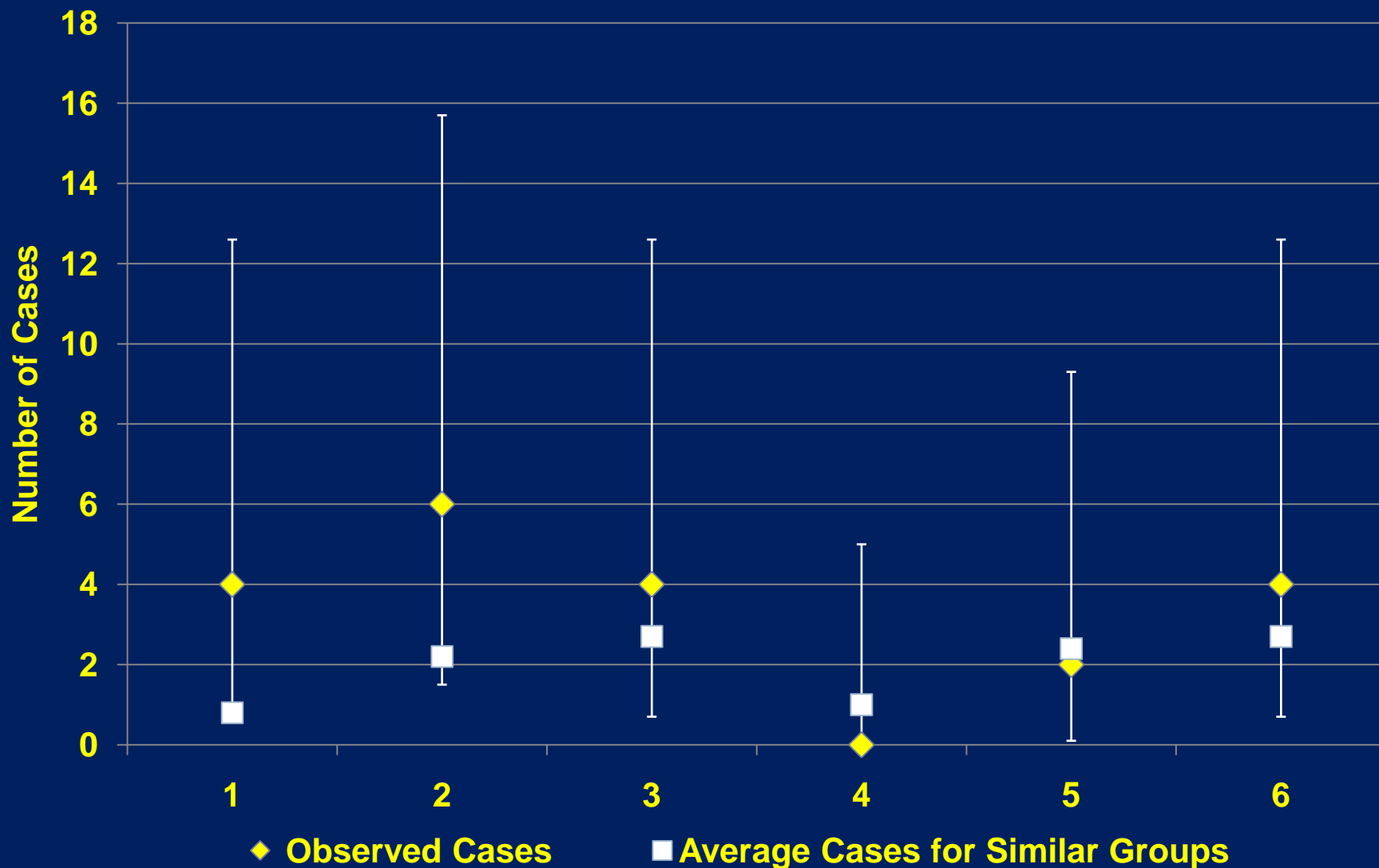
New Acute Myeloid Leukemia (AML) Cases by Census Tract, Carlsbad, California, 1996-2008



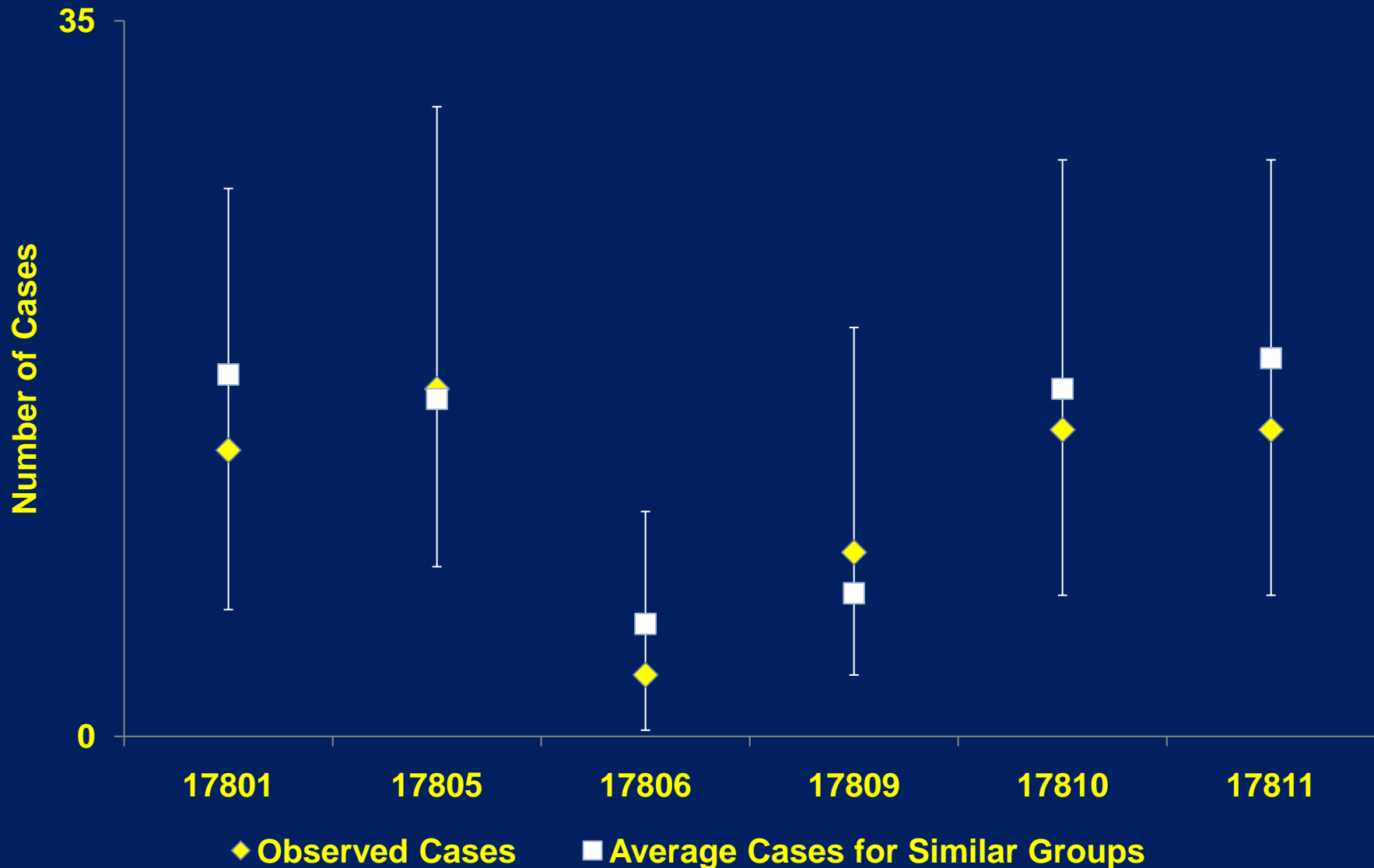
New Brain and Central Nervous System Cancer Cases by Census Tract, Carlsbad, California, 1996-2008



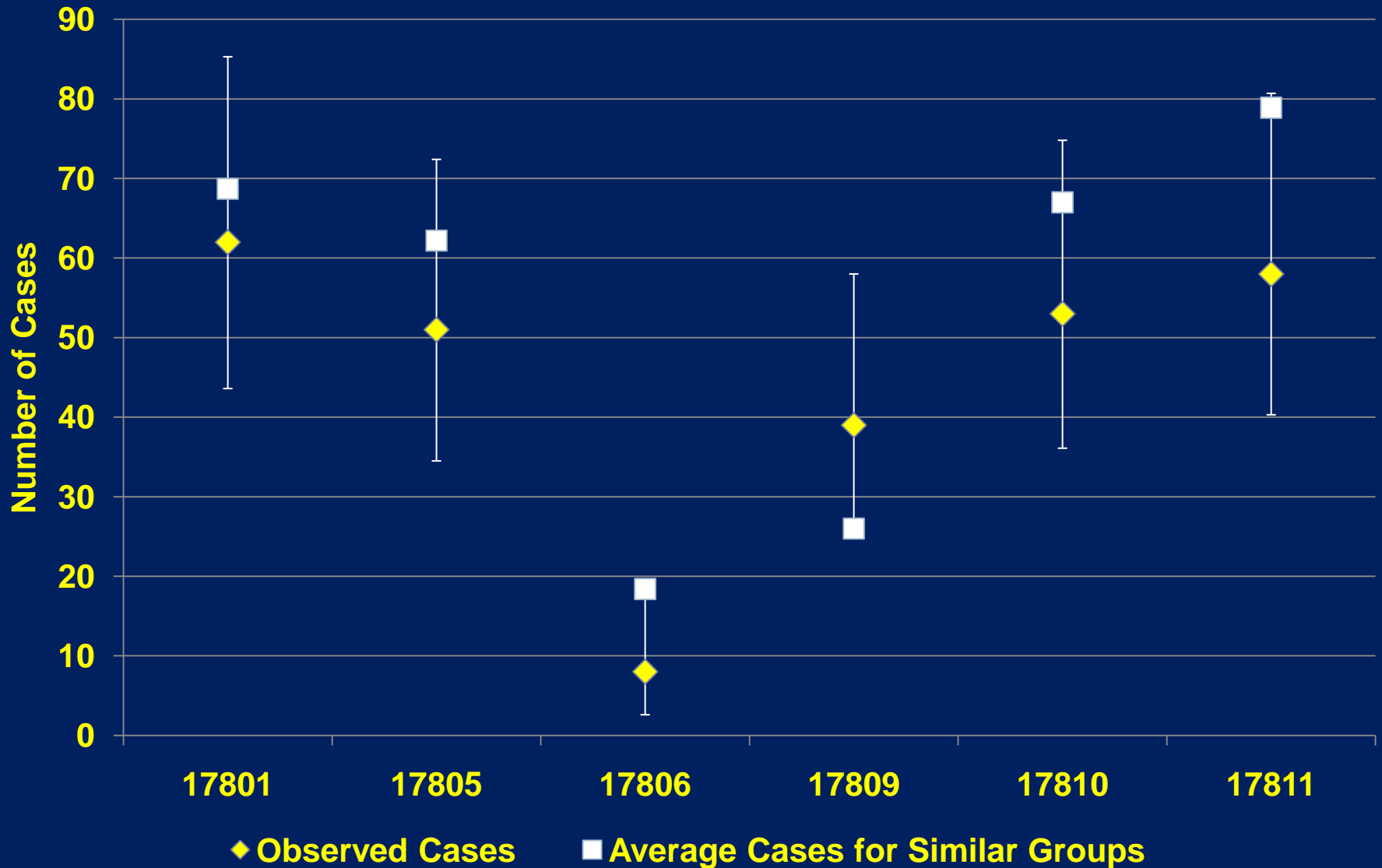
New Soft Tissue (Sarcoma) Cancer Cases by Census Tract, Carlsbad, California, 1996-2008



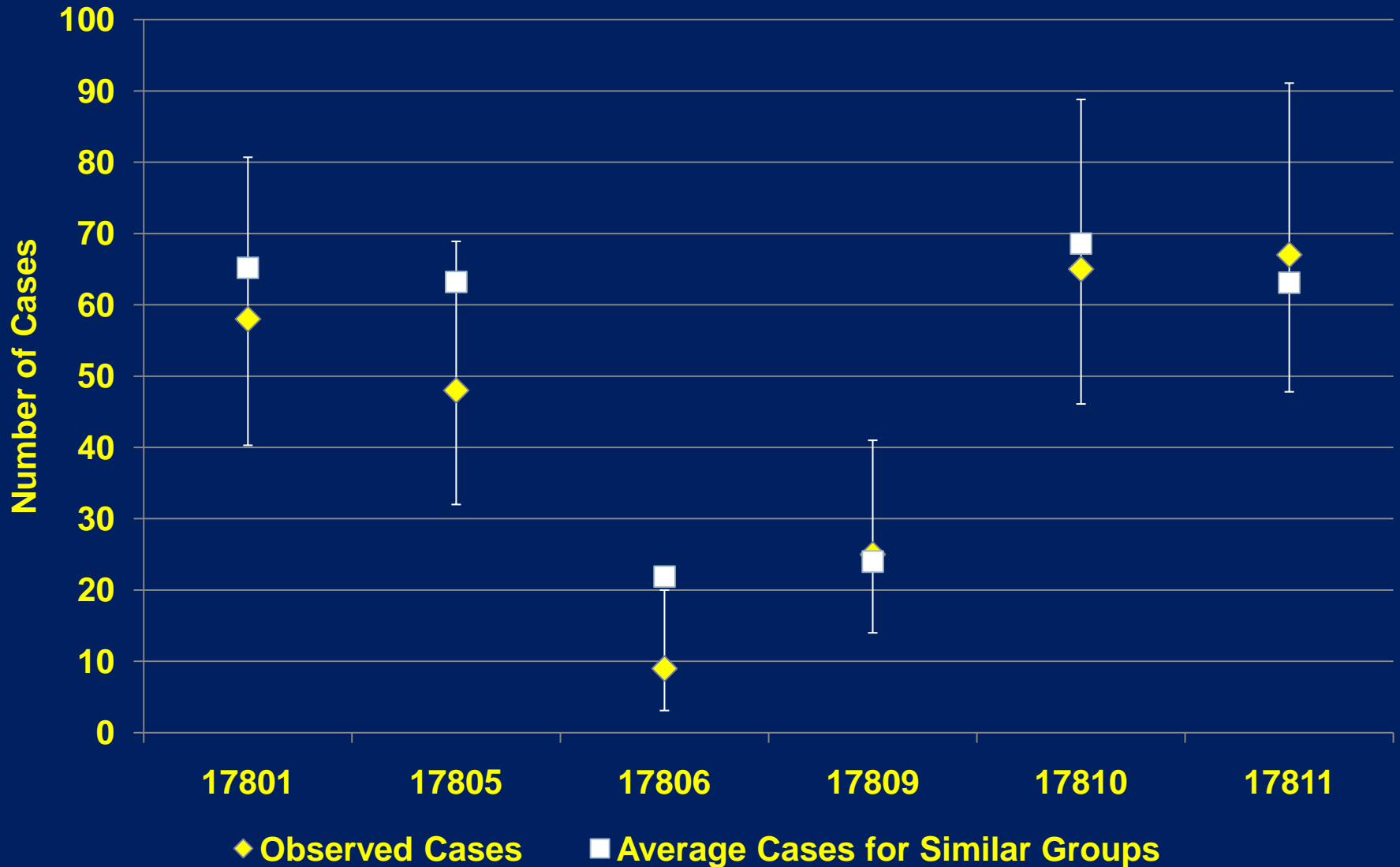
New Non-Hodgkin Lymphoma (NHL) Cases by Census Tract, Carlsbad, California, 1996-2008



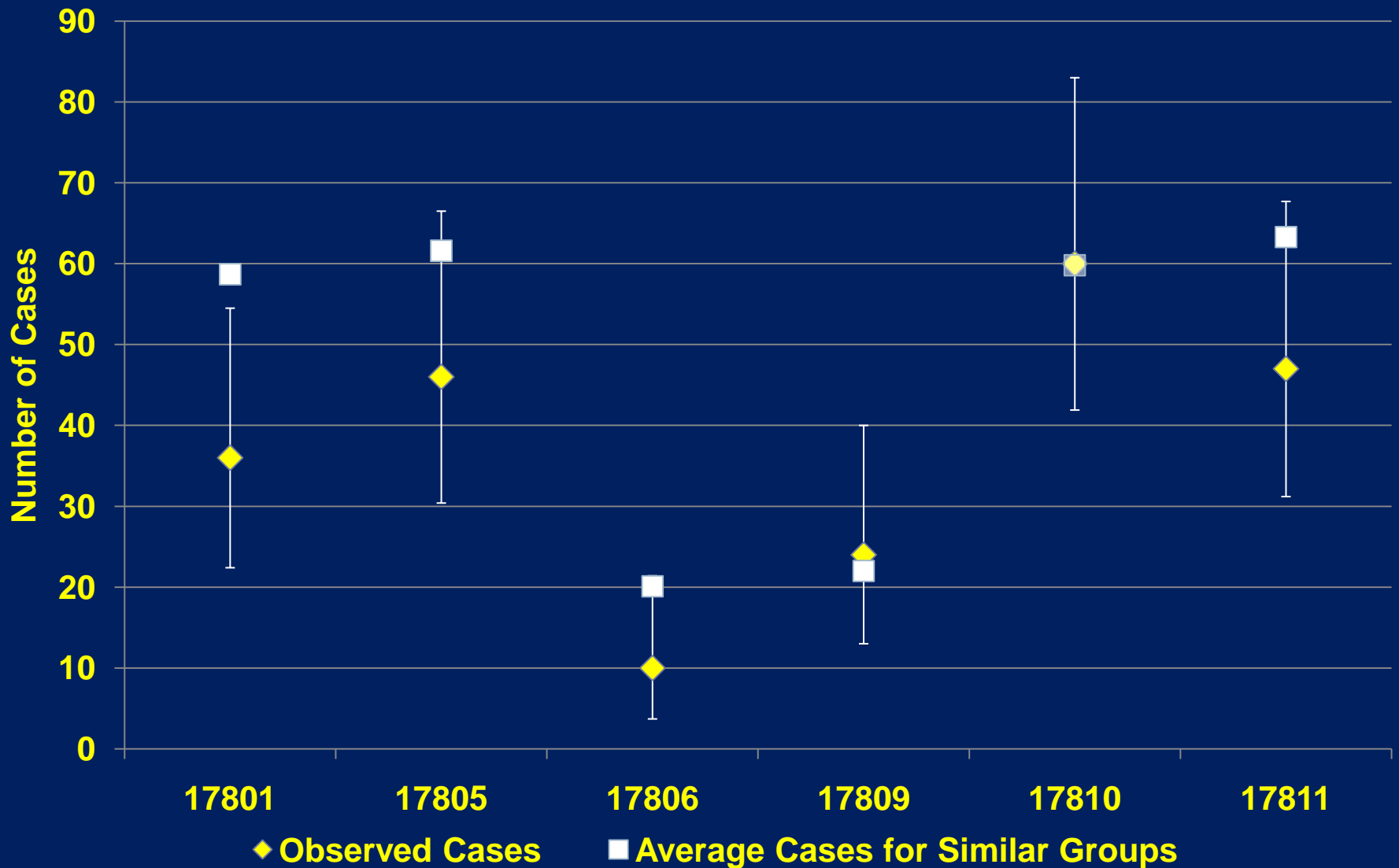
New Female Breast Cancer Cases by Census Tract, Carlsbad, California, 1996-2008



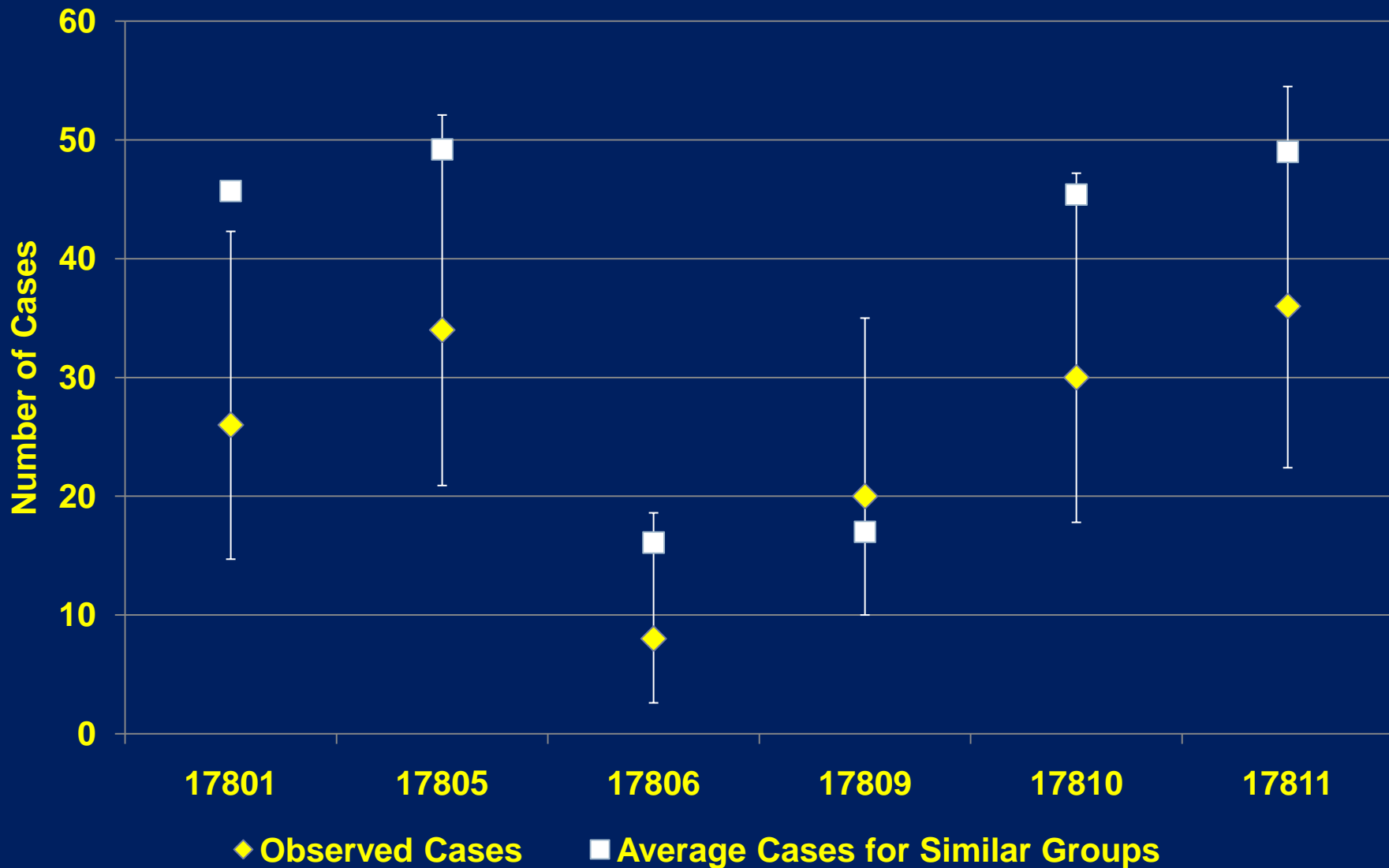
New Prostate Cancer Cases by Census Tract, Carlsbad, California, 1996-2008



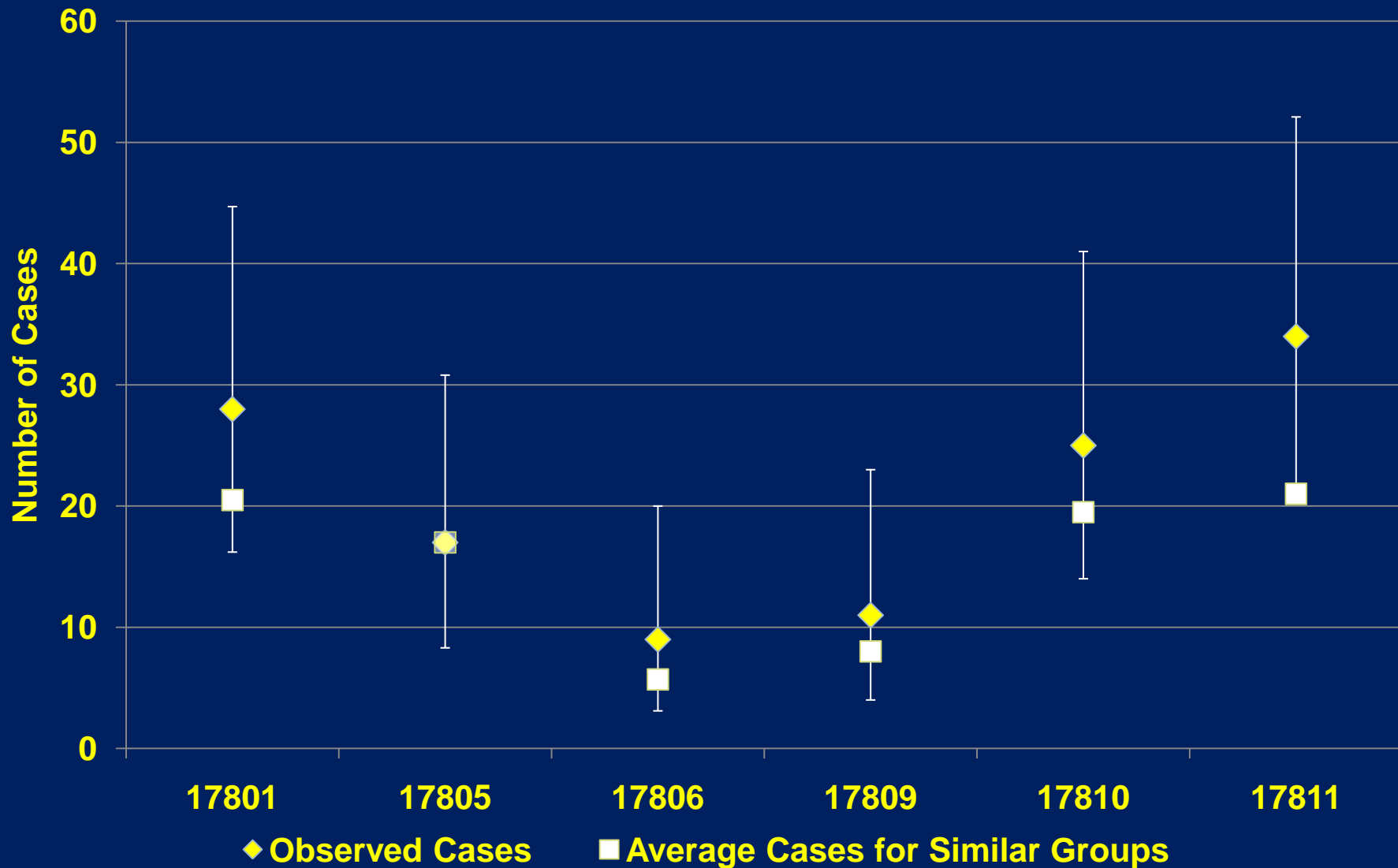
New Lung Cancer Cases by Census Tract, Carlsbad, California, 1996-2008



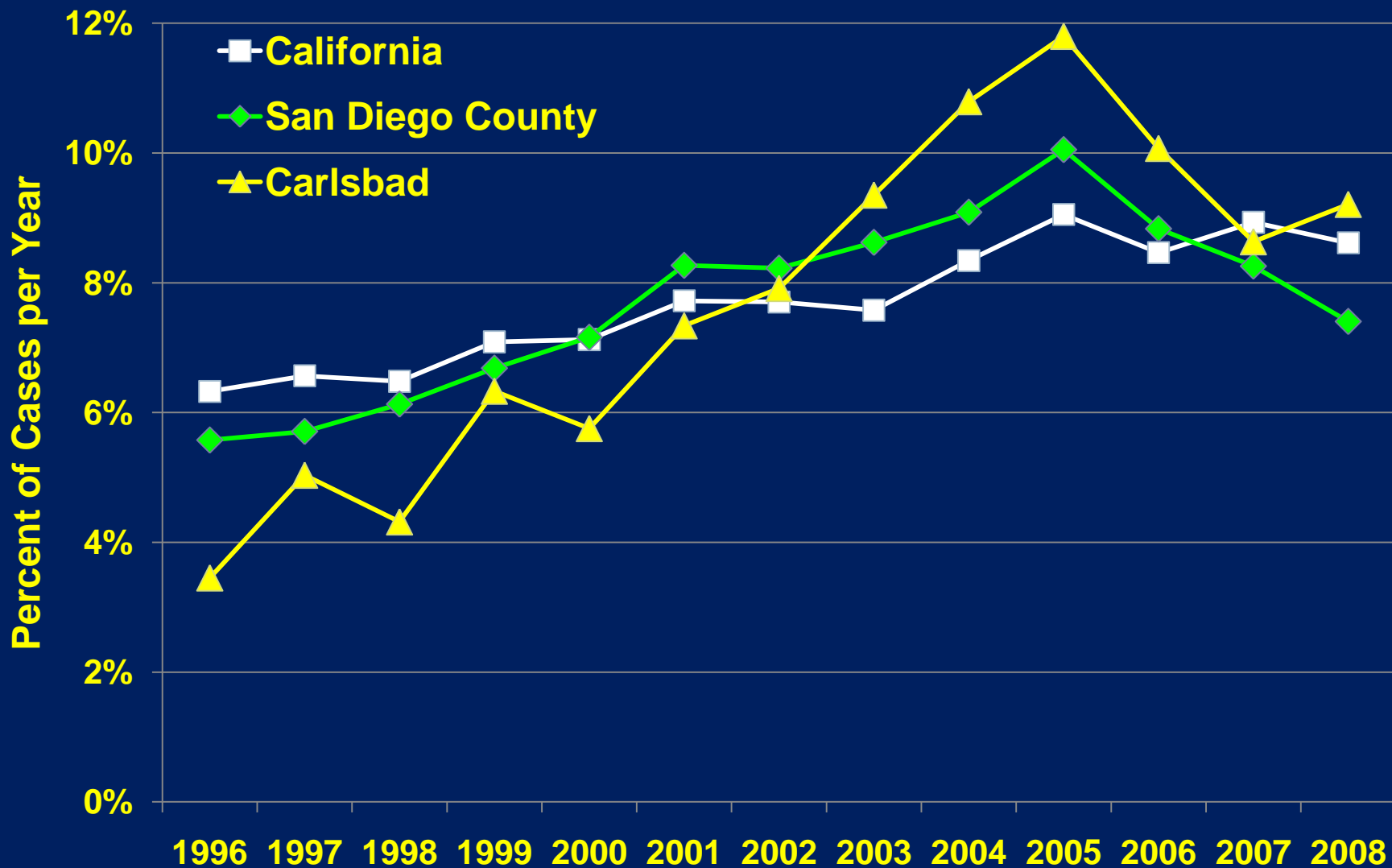
New Colorectal Cancer Cases by Census Tract, Carlsbad, California, 1996-2008



New Malignant Melanoma of the Skin Cases by Census Tract, Carlsbad, California, 1996-2008



New Malignant Melanoma Cases by Year, CA, SD County and Carlsbad, 1996-2008



Carlsbad Cancer Cases in CCR Database, 1996-2008

Census Tract	Number of Observed Cases
All 23 Carlsbad CTs	8090
17801	359
17805	354
17806	86
17809	201
17810	373
17811	388

Verification of Cases Collected by Carlsbad Community Survey, May 2010

Cases	Number
Total Number Reported on Survey	323
Number of Unique Cases	253
Verified in CCR Database	94
Not verified in CCR Database	159

Reasons that Cases Were Not Verified in CCR Database

Case	Number	Percent
Incomplete information (i.e., no name)	126	79%
Not a case of cancer	19	12%
Case diagnosed in 2009 or 2010	9	6%
Not a CA resident at diagnosis	3	2%
Case diagnosed before 1988	2	1%
Total	159	100%

Cancers Reported on Community Survey

- ▶ Brain
- ▶ Breast
- ▶ Female Genital System
- ▶ Kidney
- ▶ Larynx
- ▶ Leukemia
- ▶ Liposarcoma
- ▶ Liver
- ▶ Lung
- ▶ Lymphoma
- ▶ Melanoma
- ▶ Mesothelioma
- ▶ Neuroblastoma
- ▶ Osteosarcoma
- ▶ Pancreas
- ▶ Rhabdomyosarcoma
- ▶ Small Intestine
- ▶ Soft Tissue (Sarcoma)
- ▶ Stomach
- ▶ Thyroid

Summary of Results

- ▶ More melanoma cases than expected in Carlsbad during 1996-2008
- ▶ Increase in melanoma cases is consistent with San Diego County, CA and US trends
- ▶ #1 risk factor for melanoma = sun exposure

Summary of Results

- ▶ Slight cancer excess in CT 178.09
 - ▶ Among women aged 20 years and older only
 - ▶ No specific cancer, only for all sites combined
 - ▶ Does not represent a true cluster
- ▶ No other cancer sites with more cases than expected
 - ▶ No cancer excesses among children

Typical Characteristics of a Cancer Cluster

- ▶ Rare cancers
- ▶ High frequency of rare cancers
- ▶ Single type of cancer or a few related types of cancers
- ▶ Cancers in odd age groups
- ▶ Pre-cancer health issues related to same organs where cancers develop

Next Steps for CCR

- ▶ **Written Report with data will be completed**
- ▶ **Report will be sent to**
 - ▶ **San Diego County**
 - ▶ **CDPH Environmental Health Investigations Branch**
- ▶ **Update analysis when 2009 CCR data complete**

School-Based Cancer Concern

- ▶ To determine if a cancer excess exists at a school
 - ▶ First look at surrounding community to see if there is a cancer excess
 - ▶ To determine if teachers and staff or students are experiencing an excess
 - ▶ Must have information for all employees or students who ever worked at or attended school
 - ▶ Match against cancer registry database
 - ▶ Determine if number of cases observed is in excess of what is expected for a similar group

Additional Information

- ▶ San Diego County Cancer Concern website:
www.sdcounty.ca.gov/hhsa/programs/phs/cancer_concerns_in_carlsbad
- ▶ California Cancer Registry website:
www.ccrca.org