

Flower Mound Investigation Summary

March, 2010

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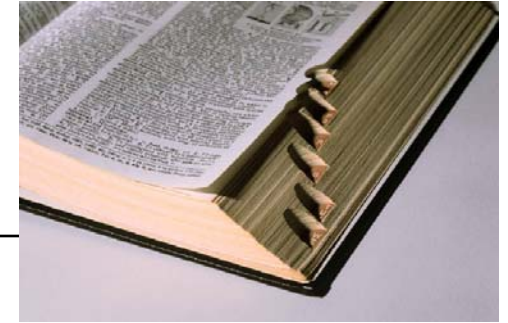
Texas Department of State Health Services

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Definition of a “Cluster”



- **What Webster says:**
“a number of persons, animals, or things gathered or situated close together”
- **What epidemiologists mean:**
“a greater than expected number of cancer cases or deaths that occur in a group of people in a specific geographic area over a specific period of time”
- **What everyone else is usually thinking:**
“There’s way too much cancer in my neighborhood/school/town”



How Does the DSHS and TCR Try to Address Cancer Cluster Concerns?

- Collaborative activity shared with Environ. & Injury Epidemiology and Toxicology Unit
- Conduct investigations of suspected cancer clusters
- Work with other federal/state agencies and local government
- Provide data to researchers for occupational and other studies

Cancer Cluster Investigation Protocol

STAGE 1. Initial Contact

Purpose: Collect information from person or group reporting possible cancer cluster



STAGE 2. Assessment

Purpose: To determine whether a) an excess has actually occurred and b) whether the excess can be linked etiologically to some exposure

Stage 2a. Preliminary Evaluation

Purpose: To provide an estimate of the statistical likelihood that an important excess has occurred

Stage 2b. Exposure Evaluation

Purpose: To identify a biologically plausible environmental exposure(s) and assess probable exposure pathways(s)

Meets Criteria

YES



NO

Summary report distributed. May recommend additional follow-up as more data becomes available.

STAGE 3. Major Feasibility Study

Purpose: To determine the feasibility of performing an epidemiologic study linking the health event and a putative exposure



STAGE 4. Etiologic Investigation

Purpose: To perform an etiologic investigation of a potential disease-exposure relationship

What Question Can a Cancer Cluster Investigation Answer?

- Whether there are more cases than expected in a given area over a specified time.
- It is not designed to establish that exposure X causes Y cancer.





Cluster Analysis Methods

- Number of observed cases compared to what would be "expected"
 - Based on state cancer rates
- Takes into consideration the race, sex, and ages of the population
- A 99% confidence interval is used for statistical significance
 - Takes into account the likelihood that the result occurred by chance.



Why Confidence Intervals Matter

- Confidence intervals take into account the variability in the number of observed and expected cases
- Provides a range in which we think the “true” estimate (observed/expected) exists
 - Standardized incidence ratio (SIR)



Small Numbers

- Example 1
 - 4 observed cases
 - 2 expected cases
 - Standardized Incidence Ratio (SIR)=2
- Example 2 – change by 1
 - 5 observed cases
 - 1 expected cases
 - SIR=5
- Confidence interval will be wide because there is a big change in SIR with small changes in cases (example 0.2 – 7.0)

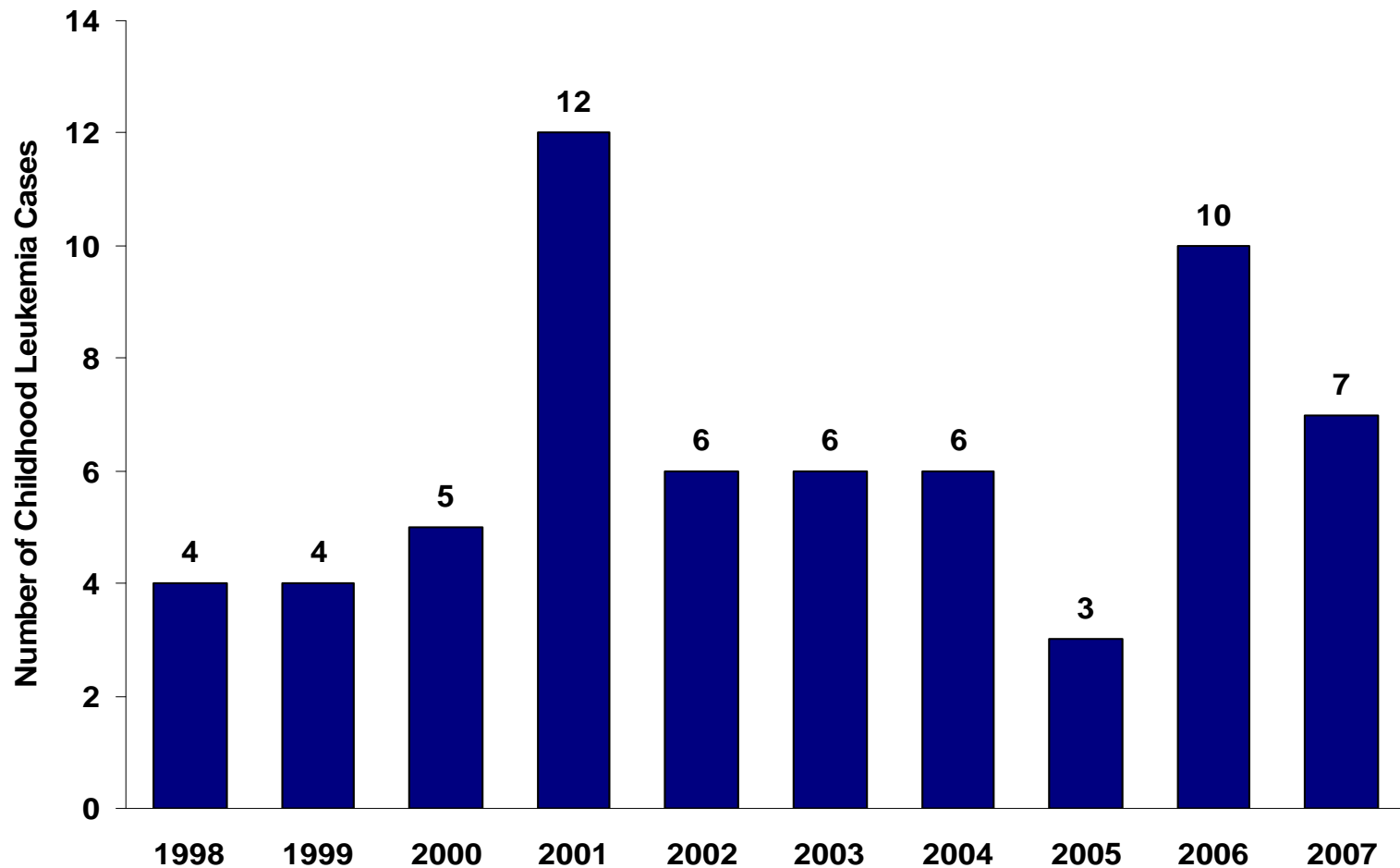


Large(r) Numbers

- Example 3
 - 200 observed cases
 - 150 expected cases
 - $SIR=1.3$
- Example 4 – change by 25
 - 225 observed cases
 - 125 expected cases
 - $SIR=1.8$
- Confidence interval won't be as wide because bigger changes in cases doesn't result in as much change in SIR (example 1.0 – 2.0).



Newly Diagnosed Childhood Leukemia (0-19 Years) in Denton County, 1998-2007





Limitations of Cancer Cluster Investigations

- Cancer generally takes a long time to develop.
 - Among adults, ten or more years often pass between environmental exposures or the existence of other risk factors and detectable cancer.
 - Change of residence



Limitations

- Inadequate control of confounding factors (e.g. diet, tobacco, etc.)
- Cancer clusters can occur by chance and may not necessarily be due to any common or identifiable cause
- Small populations
 - Less precision
 - Behaviors can “cluster”



When Cancer Cases are More Likely to Represent a Cancer Cluster

- A large number of cases of one type of cancer, rather than several different types
- A rare type of cancer, rather than common types
- A number of a specific type of cancer in age groups not usually affected by that type of cancer

*These situations are likely to indicate a common source or mechanism of carcinogenesis, which is the process by which cancer develops.



Planned Investigations for Flower Mound, Texas, Zip Codes: 75028/75022

- For 1998-2007
 - Childhood leukemia (all subtypes)
 - Leukemia (all subtypes and ages)
 - Non-Hodgkin's lymphoma (all ages)
- Will evaluate other cancer types that are brought to our attention
- Will update investigation as new data become available



Actual Investigation for Flower Mound, Texas, Zip Codes: 75028/75022

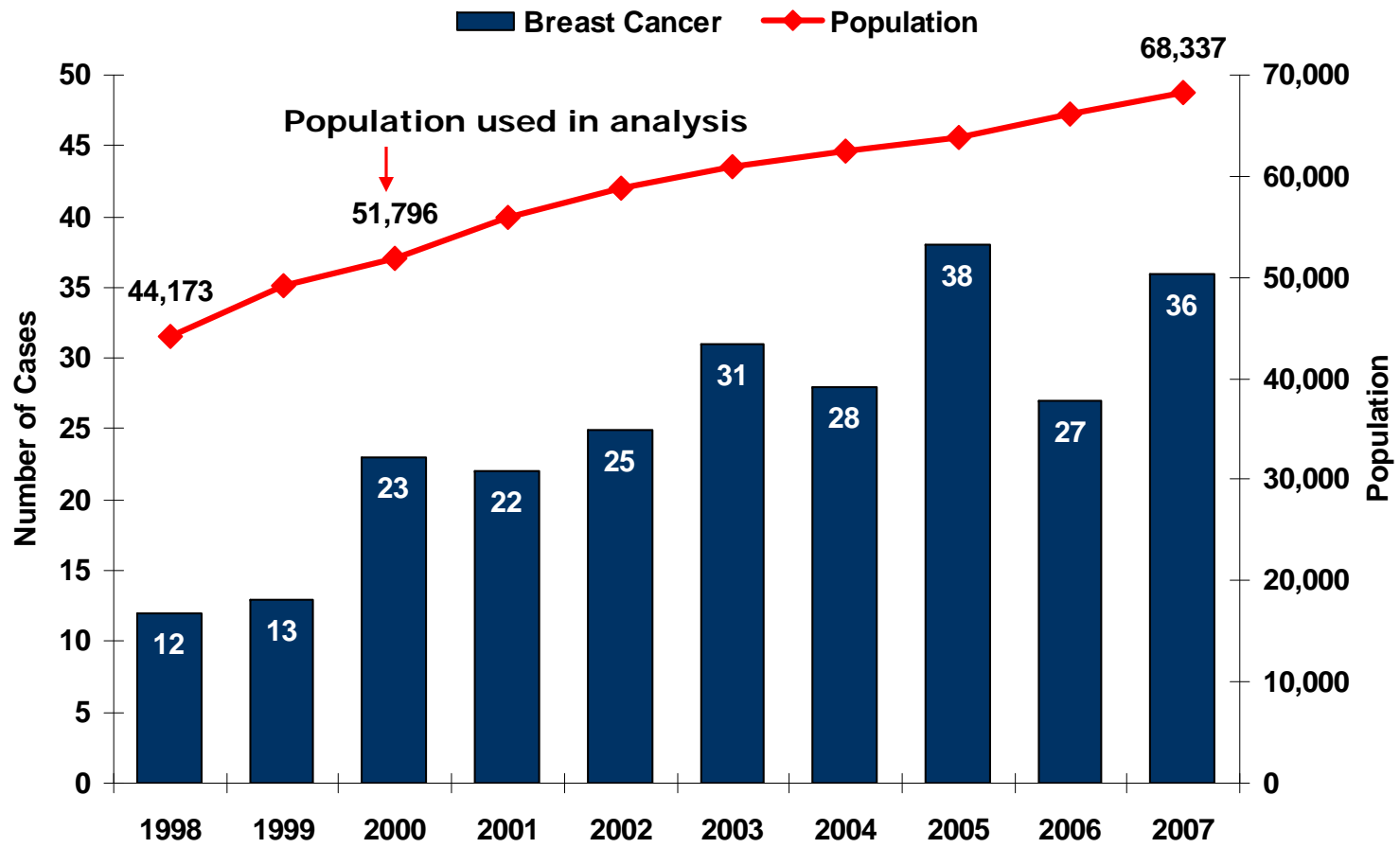
- For 1998-2007
 - Childhood leukemia (all subtypes)
 - Leukemia (all subtypes and ages)
 - Non-Hodgkin's lymphoma (all ages)
 - Female Breast
 - Childhood brain/CNS
- Will update investigation as new data become available



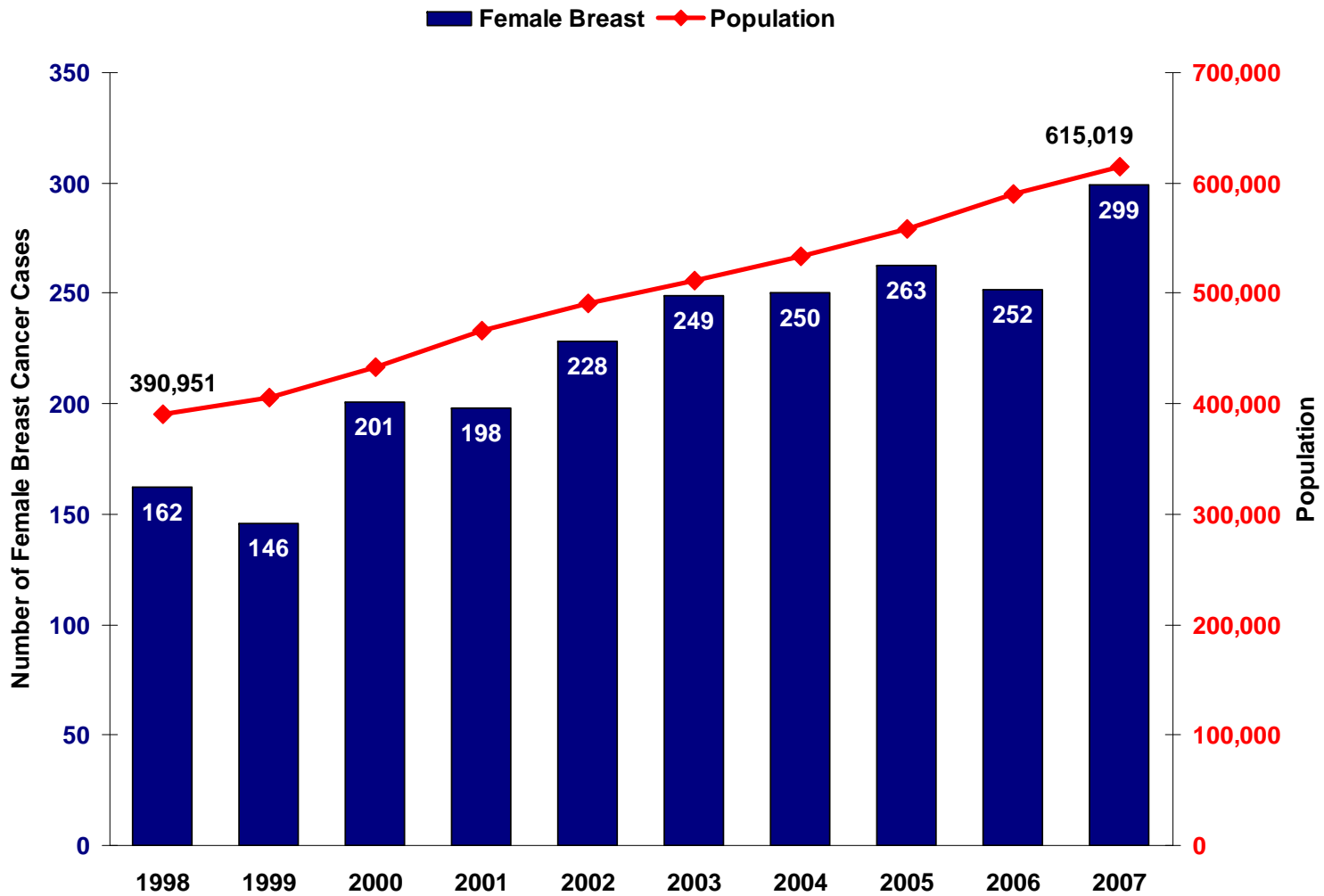
Results: 1998-2007

- All cancer types except for breast cancer fell within the expected range.
- We feel the breast cancer result can likely be attributed to the limitations of the data and the likelihood that women get mammograms more often than women in Texas overall.

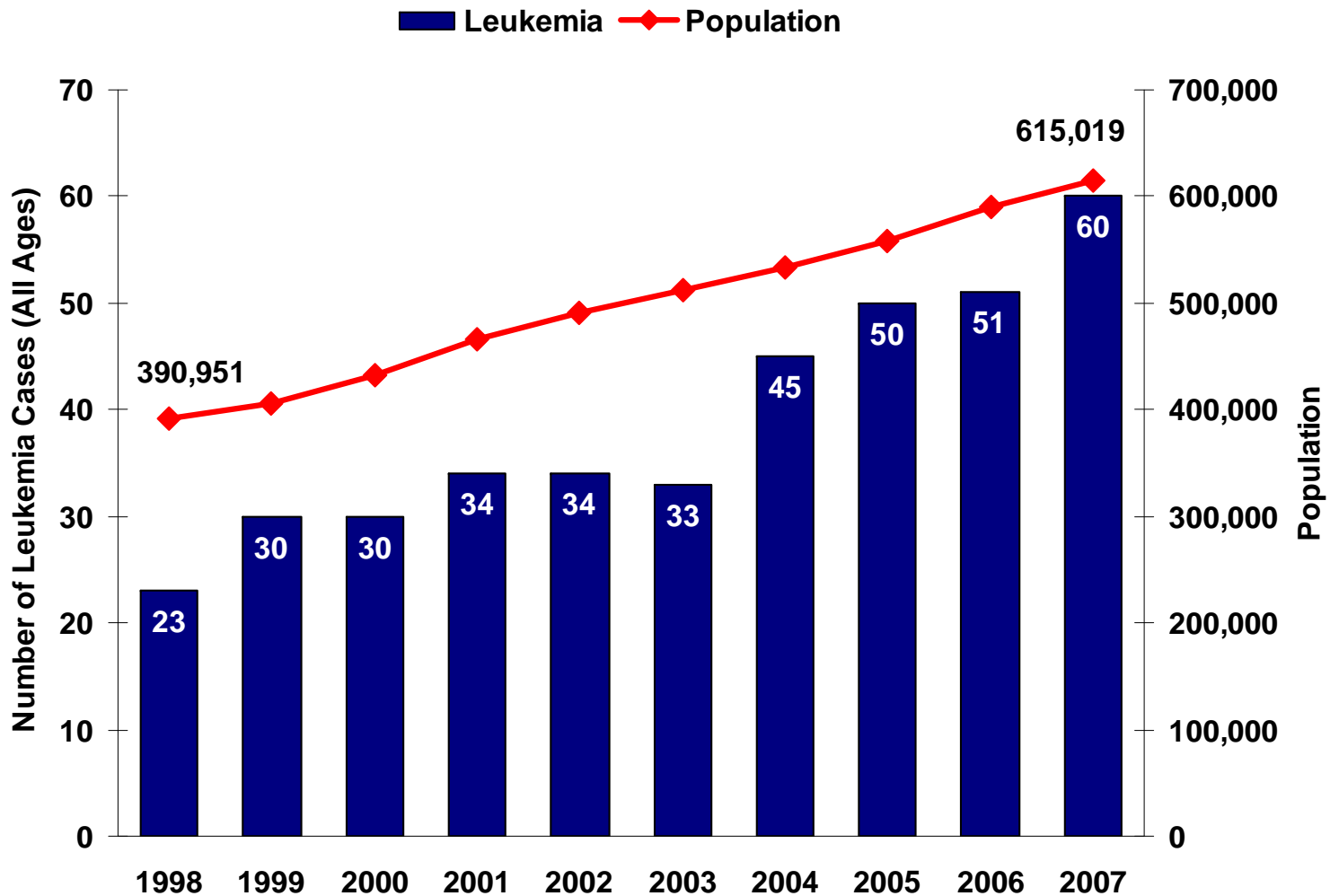
Newly Diagnosed Female Breast Cancer Cases and Population Increases in Flower Mound, Texas, 1998-2007



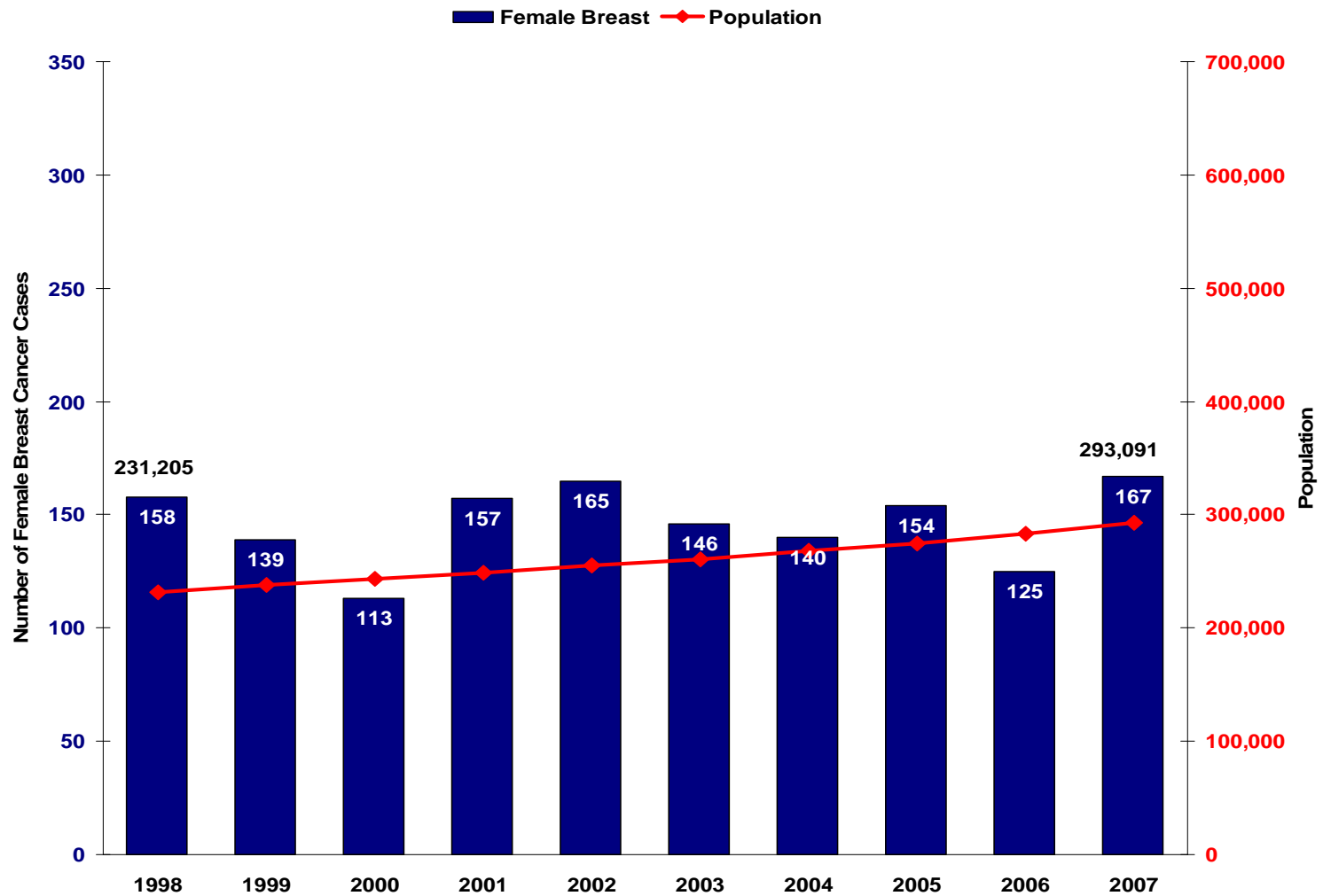
Female Breast Cancer and Population Increases in Denton County, 1998-2007



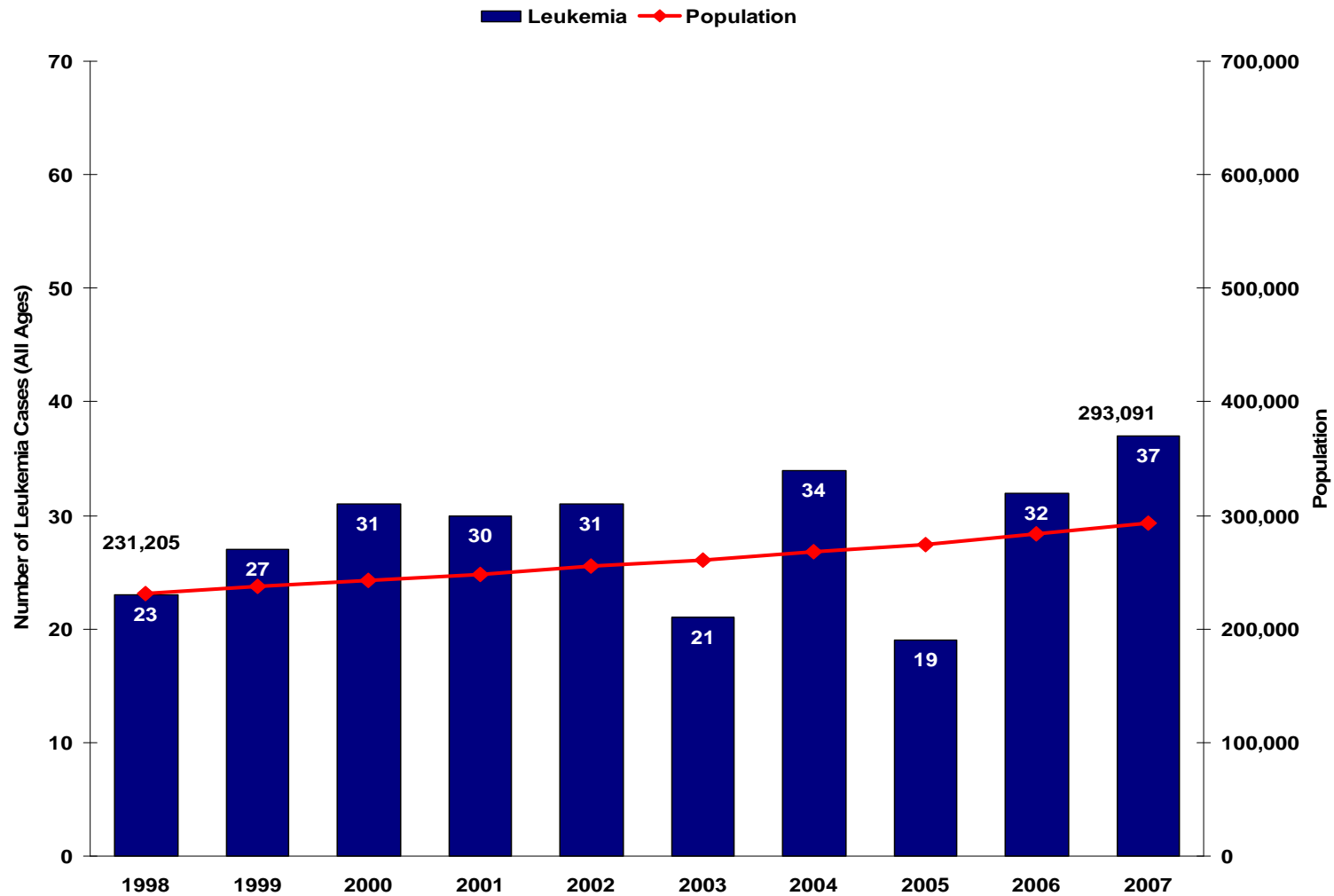
Overall Leukemia (All Ages and Subtypes) and Population Increases in Denton County 1998-2007



Female Breast Cancer and Population Increases in Brazoria County, 1998-2007




Overall Leukemia (All Ages and Subtypes) and Population Increases in Brazoria County 1998-2007





Planned Investigations for Flower Mound, Texas, Zip Codes: 75028/75022

- For 2008-Present
 - Working to medically confirm the number and type of childhood cancers reported
 - Gathering information from the community
 - Determining if the patient is in our system
 - Working with health care providers to collect missing information as needed
 - Will be compared to previous years of complete data



Actual Investigation for Flower Mound, Texas, Zip Codes: 75028/75022

- For 2008-Present
 - Worked to medically confirm the number and type of childhood cancers reported
- For 2007-2009
 - Compared average annual number of cases to 1998-2007



Important Notes

- Needed to include 2007 data to comply with patient confidentiality protections (3 years of data at zip code level)
- Data are preliminary and not yet complete
- Averages do not take into account the differences in population size between the 2 time periods
 - Bigger populations = more cases



Why Can't 2008-Present Data Be Used in the Cancer Cluster Analysis?

- Complete statewide data are required to estimate the number of expected cases
 - It is not sufficient to only have complete data for a particular community
- The TCR receives approximately 250,000 reports of cancer each year for over 100,000 newly diagnosed cancers.
 - It takes a substantial amount of time to make sure the data are complete and accurate.



Results: 2007-2009

- Average annual number of childhood cancers remained essentially unchanged
- Average annual number of cases of overall leukemia, non-Hodgkin's lymphoma and breast cancer were somewhat higher compared to 1998-2007



Next Steps

- Will continue to monitor the number of cases (all cancer types).
- Will annually update the investigation as new data become available.



For more information on cancer in Texas
or to make a data request, please contact:

Cancer Epidemiology and Surveillance
Texas Department of State Health Services
1100 W. 49th Street
Austin, Texas 78756
(512) 458-7523 –or- (800) 252-8059
Cancerdata@dshs.state.tx.us

Visit us on the Web:
<http://www.dshs.state.tx.us/tcr>

Questions for Me or About This Presentation

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- 512-458-7111 ext. 3603

Thank you

