

**ATTACHMENT 2
PRESENTATIONS**

Annotated bibliography of select reports regarding bedrock and DNAPL in OU1 Area

Preliminary Report Chemical Leak Project (Guitierrez-Palmenberg, Inc., 1983)

- Initial geologic evaluations started at the map scale using the Geologic Map of the Tempe Quadrangle
- Surface geophysical surveys (using electrical resistivity methods) were employed prior to subsurface drilling to identify subsurface conditions in the OU1 Area
- Initial well installation activities included exploratory borings and both alluvial and bedrock wells. Bedrock wells were installed using continuous coring for lithologic identification and evaluation of degree and orientation of fractures in bedrock
- Down-hole geophysical logging and pneumatic packer testing were conducted in bedrock wells to obtain geologic and hydraulic properties of the bedrock.
- Initial subsurface structures mapped using borehole data and rock outcrops in Papago Park
- Initial aquifer testing conducted
- Bedrock trough (associated with the now identified bedrock ridge) identified as having an impact on plume migration

Stratigraphic Borings Report (Dames & Moore, 1985)

- Subsurface cross-sections and preliminary structural geology analysis based on borehole data

Draft Source Verification Report (Dames & Moore, 1986)

- Results of source verification investigations

Remedial Investigation Report and Feasibility Study Report (Dames & Moore, 1987)

- Presence of free phase solvents (also known as Dense Non-aqueous Phase Liquids or “DNAPLs”) was recognized and an initial evaluation of two-phased liquid permeability performed
- Analysis of DNAPL chemistry
- Laboratory analysis of adsorption of DNAPL onto aquifer materials
- Additional well installation activities included both alluvial and bedrock wells. Bedrock wells were installed using both rotary and continuous coring for lithologic identification and evaluation of degree and orientation of fractures in bedrock
- Down-hole geophysical logging
- Additional aquifer testing including packer test, slug test and pumping test
- Evaluation of remedial alternatives for on-site and off-site groundwater remedial approaches and technologies

Report: Review of Bedrock Issues (Dames & Moore, March 14, 1990)

- Preliminary evaluation of issues related to bedrock, groundwater contamination in bedrock and recovery of contaminated water from bedrock.

Bedrock Data Report (Dames & Moore, February 8, 1991)

- Comprehensive compilation and re-analysis of bedrock specific data in the OU1 area to provide additional support for evaluation of remedial alternatives proposed in 1987 RI/FS.
- Re-affirmed conclusions regarding bedrock remedy in FS.

Groundwater Remedial Alternatives Analysis, Motorola 52nd Street OU1, Phoenix, Arizona. (GeoTrans, Inc., September 30, 2005); and Addendum to Groundwater Remedial Alternatives Analysis, Evaluation of Technical Impracticability of Groundwater Restoration at the Motorola 52nd Street OU1, Phoenix, Arizona (GeoTrans, Inc., December 2005)

- State of the Science evaluation of source zone remediation technologies, approaches and outcomes
- Evaluation of potential modifications to OU1 remedy and enhanced source zone remediation efforts

Well Completion Report DM614, DM615 and DM314 (Clear Creek Associates, 2009)

- Lithologic logs, geophysical logs, optical televiewer analysis of corehole lithology and fractures
- Aquifer testing of source area extraction well

Bedrock Pilot Study Preliminary Findings Report (Clear Creek Associates, 2010)

- Step and Constant rate aquifer testing results
- Low-flow flowmeter and cross-borehole flow meter testing results to identify fracture flow and fracture interconnectivity
- Bedrock extraction system operations results

Bedrock Pilot Study Operations Report (Clear Creek Associates, 2011)

- Bedrock extraction system evaluation

Annual OU1 Effectiveness Reports (Dames & Moore [1993-99], Clear Creek Associates [2000-2014])

- Evaluation of effectiveness of OU1 groundwater remedy on meeting objective of hydraulic containment and effect on alluvial and bedrock water quality over time

SELECT REFERENCES – DNAPL EVALUATION AND REMEDIATION

- Cohen, Robert M., Mercer, James W. 1993. DNAPL Site Evaluation. Produced for US Environmental Protection Agency Robert S. Kerr Environmental Research Laboratory. EPA/600/R-93/022. C.K. Smoley Books, CRC Press.
- EPA. 1992. Estimating Potential for Occurrence of DNAPL at Superfund Sites. OSWER Publication 9355.4-07FS. EPA Office of Solid Waste and Emergency Response.
- EPA. 1993a. Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration. OSWER Directive 9234.2-25. EPA Office of Solid Waste and Emergency Response.
- EPA. 1993b. Evaluation of the Likelihood of DNAPL Presence at NPL Sites. OSWER Publication 9355.4-13. EPA 540R-93-0743. EPA Office of Solid Waste and Emergency Response.
- EPA. 1996. Presumptive Response Strategies and Ex-Situ Treatment Technologies for Contaminated Ground Water at CERCLA Sites. OSWER Directive 9283.1-12. EPA 540/R-96/023. EPA Office of Solid Waste and Emergency Response.
- EPA. 2003. The DNAPL Remediation Challenge: Is There a Case for Source Depletion. EPA/600/R-03/143. National Risk Management Research Laboratory.
- Huling, Scott G., Weaver, James W. 1991. Ground Water Issue – Dense Nonaqueous Phase Liquids. EPA/540/4-91-002. EPA Office of Solid Waste and Emergency Response.
- National Research Council. 1994. Alternatives for Groundwater Cleanup. The National Academies Press.
- National Research Council. 2005. Contaminants in the Subsurface – Source Zone Assessment and Remediation. The National Academies Press.
- National Research Council. 2013. Alternatives for Managing Complex Contaminated Groundwater Sites. The National Academies Press.
- Pankow, James F., Cherry, John A. 1996. Dense Chlorinated Solvents and other DNAPLs in Groundwater. Waterloo Press.
- Sale, T. Newell, C., Stroo, H., Hinchee, R., Johnson, P. 2008. Frequently Asked Questions Regarding Management of Chlorinated Solvents in Soil and Groundwater. Department of Defense Environmental Security Technology Certification Program (ESTCP).

ADHS Updates

October 30, 2014



Health and Wellness for all Arizonans

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Environmental Toxicology Program

- Funded by the Agency for Toxic Substances and Disease Registry
- Determine whether exposure to substances might cause harm to a community
- Recommend actions that can safeguard residents' health
- Educate communities about hazardous chemicals and substances



Health Consultations

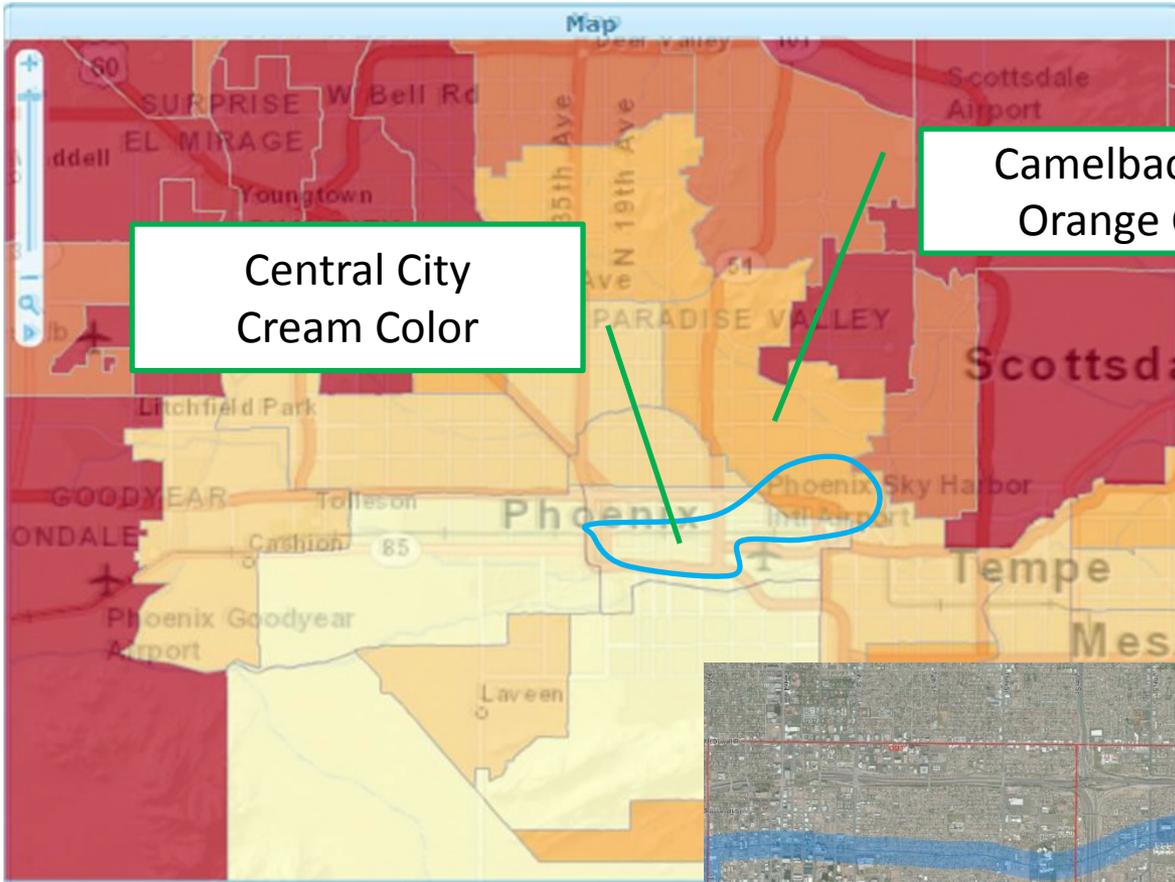
- Streamlined assessment using risk assessment principles
- Purpose: To evaluate the available information to determine whether people are exposed to substances at high enough levels for long enough periods of time to cause harm
- Provide recommendations to agencies and communities on ways to reduce exposure or protect their health

M52 Health Consultation

- Reviewing vapor intrusion data from OU1
 - Are people exposed to VOCs in their homes at high enough levels for long enough periods of time to cause harm?
- Draft underway
 - Nearly ready for review process
- Will review additional VI data for OU2 when available

Cancer Review

- April: discussed limitations of cancer reviews
- Received feedback that the CIG does not find the cancer review beneficial
- ADHS paused work on the cancer review
 - Uncertainty due to low numbers
 - Geography: plume vs. CHAAS (Community Health Analysis Areas)

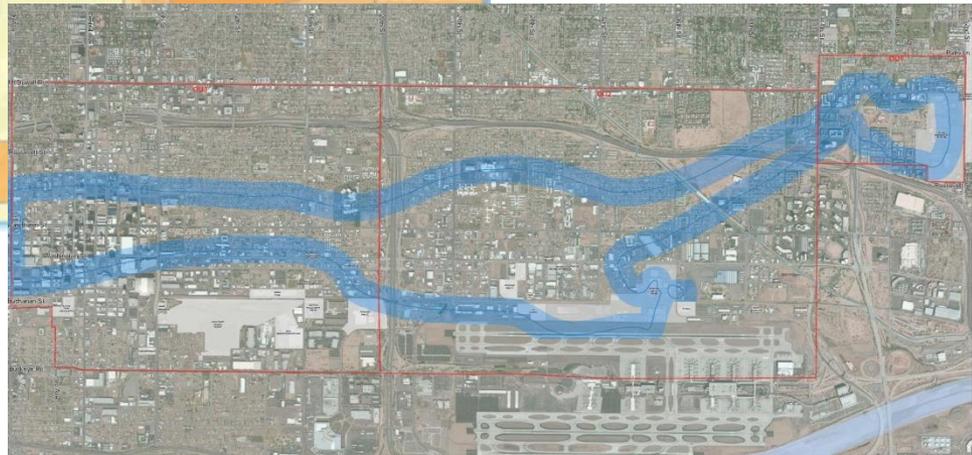


Central City
Cream Color

Camelback East
Orange Color

CHAAS

- Camelback East
- Central City



Birth Defects Review

- Limitations
- Should we continue?
 - Is there public health value in conducting a birth defects review given the limitations that exist?

Arizona Department of Health Services Arizona Cancer Registry April 3, 2014



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ARIZONA CANCER REGISTRY

- Overview
- Operations (Who, What, When)
- Reporting Issues / Data Issues
- Quality Assurance Activities
- Cancer Registry Organizations
- Cancer Registry Data Uses

Arizona Cancer Registry

Operations Section

- *Vacant, Section Manager*
- *Rosie Caballero, Linda Rossi, Vu Truong,*
- Data Processing, Quality Control, Editing, Tracking, Data Collection
- Hospitals, Clinics, Physicians, Pathology Laboratories, OOS data

Quality Assurance Section

- *Daniel Garcia, Section Manager*
- QA Studies, Audits, Death Clearance

Training Section

- *Teri Johnson, Section Manager*
- Training – internal/external, Documentation of internal policies, User manuals/documentation

Data Section

- *Chris Newton, Epidemiologist*
- Data analysis, report writing, cancer concerns

Senior Program Analyst

- *Keith Laubham*
- Enhance electronic reporting capabilities, enhance data (i.e. linkages)

History of Data Collection

- Collecting information on cancer cases since 1981
- Mandating reporting legislation in 1988
- Rules became effective 1992
- Complete reporting first accomplished
 - In 1995
 - At least 95% of cases that are available to ADHS

Legislative Mandate A.R.S. § 36-133

- Legislative mandate to....create a central statewide chronic disease surveillance system
- The purpose...collect, manage, and analyze information on the incidence and survival of persons diagnosed with cancer in Arizona

Goals

- To collect complete and accurate information of cancer incidence and monitor incidence patterns.
- To identify regions of this state that need intervention programs or epidemiologic research, detection and prevention
- To identify population subgroups at high risk for cancer

Goals

- To improve and maintain high standards in the quality of information gathered relating to the detection, diagnosis, and treatment of persons diagnosed with cancer
- To perform epidemiologic studies, and to provide biostatistic and epidemiologic information to the medical community

Funding

- State General Appropriation
- Centers for Disease Control and Prevention
 - National Program of Cancer Registries Cooperative Agreement (5U58DP003858)
 - Enhancement funds

Who Reports?

- Major Sources of Cases
 - Hospitals
 - Clinics
 - Physicians
- Other Sources of Cases
 - Pathology Laboratories
 - Out-of-state Data Exchange Agreements
 - Vital Records

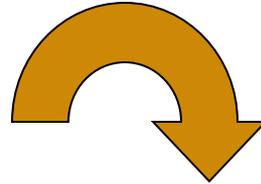
IHS & Federal Reporting Sources

- New Mexico Tumor Registry (NMTR)
 - 3-way agreement with NMTR and IHS
 - NMTR travels to Arizona for data collection
- Federal facilities
 - Military
 - VA

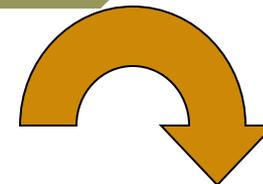
Flow of Information

Hospital ► State ► National

Health care providers record patient information and diagnosis. Hospital-based cancer registrar abstracts patient information into uniform data sets.



Patient data are aggregated on a state level. The state performs additional quality control procedures and conducts analysis.



National data are only as good as state and local data

Data are de-identified and aggregated and then sent to national registries. (CDC NPCR, NCI SEER or NAACCR)

Registries

- **Hospital Cancer Registry**

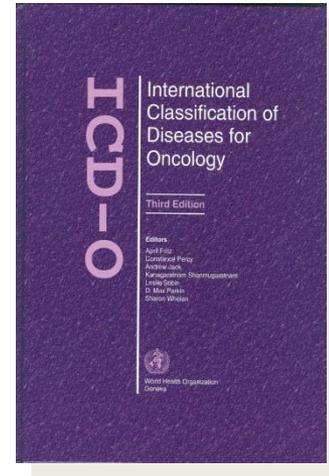
- The data are used to improve patient care by assessing patterns of care and outcomes relative to national norms.

- **State Cancer Registry**

- Track the incidence and mortality of cancer within the population at risk or the state's population.
- State registry data focuses on public health rather than individual patients.

What is reportable?

- Malignant neoplasms:
 - solid or hematopoietic
 - carcinoma in situ
- Benign tumors of the central nervous system
- Exceptions:
 - Skin cancers (basal cell/squamous cell)
 - Carcinoma in situ of the cervix



What Type of Information is Reported?

- Hospitals
 - Full Case Report - Text and coded data
 - Follow-up – Annual follow-up is required for each reported case in order to obtain vital & disease status
- Clinics/Physicians
 - Abbreviated Case Report

Cancer Registries collect a wide range of cancer-related information - including demographics and other cancer-related Information

- **Demographic**
 - Age, Sex, Race/Ethnicity, Residence, Occupation
- **Diagnosis and prognosis indicators**
 - Site, Histology, Behavior, Size, Lymph Node, Stage (extension)
 - For some sites immunohistochemistry - molecular studies of lymph nodes
- **Treatment patterns**
 - Surgery, Chemo, Radiation, Hormone, Immunotherapy
- **Outcomes**
 - Cancer recurrence, vital status, cause of death
 - Survival rates

When is the Case Reported?

- Hospitals
 - 180 days from the date of discharge
- Cancer Clinics
 - 90 days of diagnosis or treatment
- Physicians
 - Within 30 days

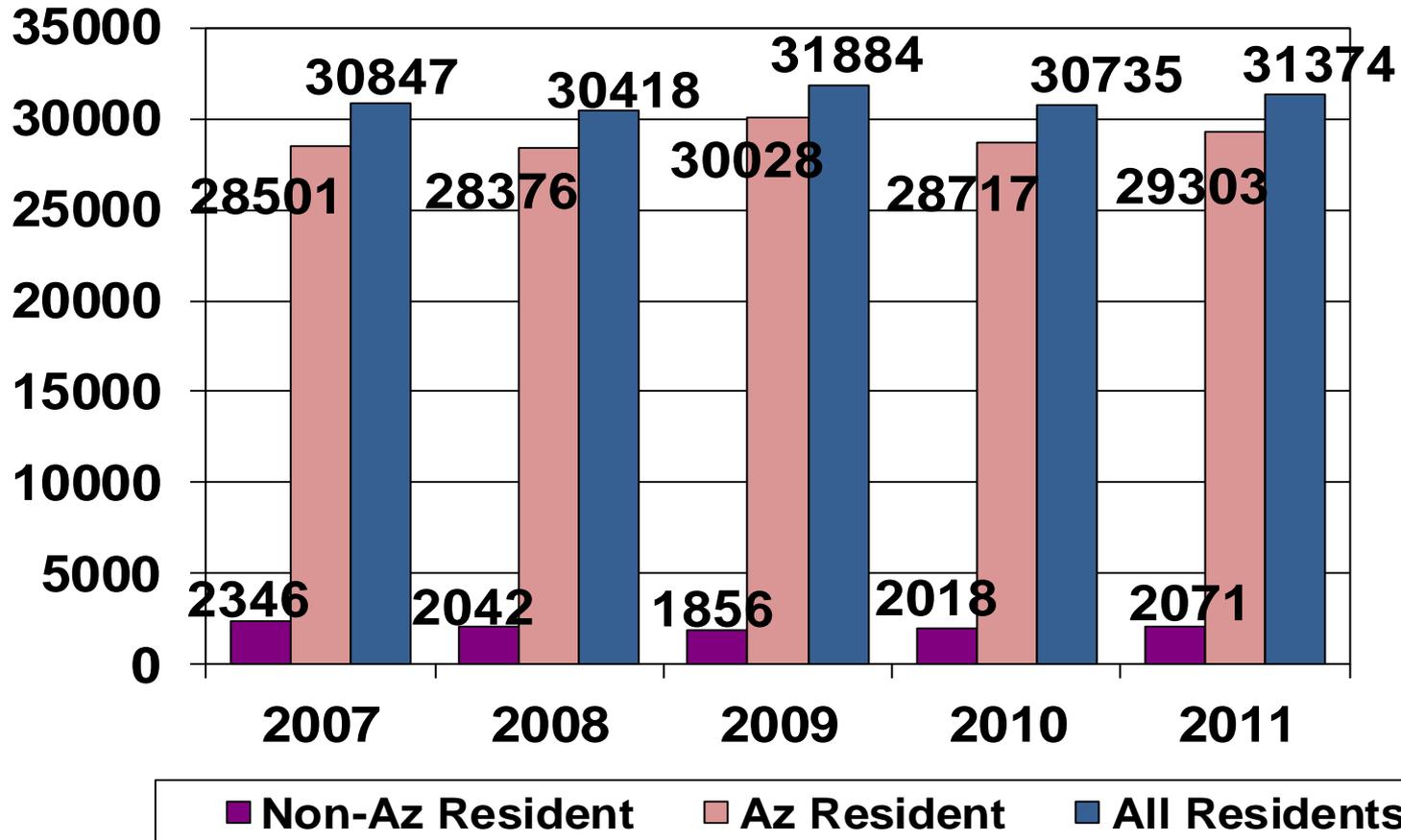
Reporting Issues

- Timeliness/Completeness
- Physician/Pathology lab
- Unique Arizona Population
 - Winter Visitors
 - Native American population
 - Hispanic population
- Geography of the State
 - 15 Counties



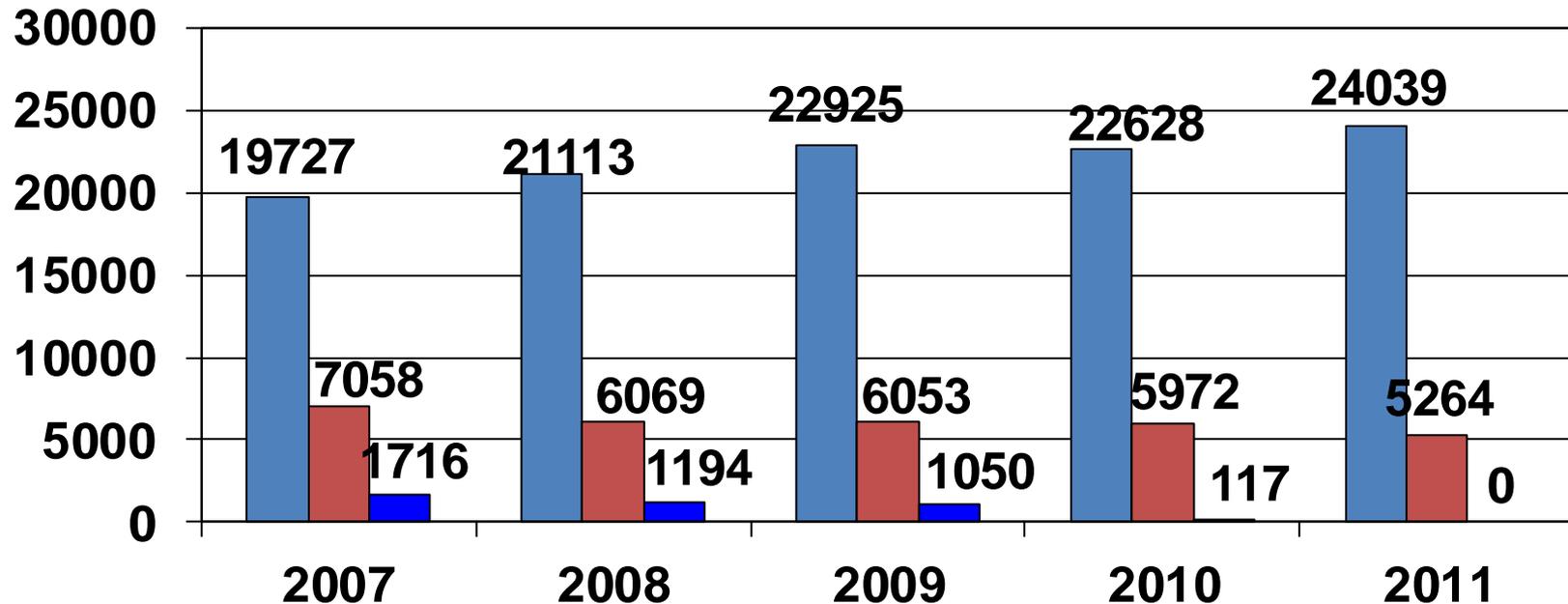
Cancer Cases 2006-2010

(Invasive and In Situ Cancers)



Timeliness/Completeness (AZ Resident, Invasive & In Situ Cancers)

(As of 10/2013)



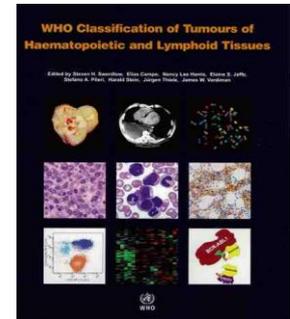
■ Reported within 1yr ■ Reported within 2yrs ■ Reported after 2yrs

Data Issues

- **New reportable diseases**

- Effective with 2001 cases
 - New terms considered malignant
 - Example: Myelodysplastic syndrome
 - Terms considered malignant now borderline
 - Example: Ovary
- Changes in 2010

- Hematopoietic and Lymphoid Neoplasms
 - Medical Advances- Immunophenotyping, molecular and genetic testing
 - New, more specific histology terms
 - New reportability conditions and transformations

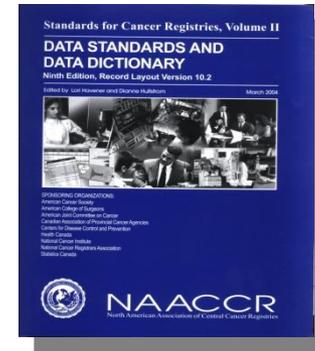


- **Changes in rules over time**

- Effective with 2007 cases
 - Multiple Primary and Histology Coding Rules
 - New rules to determine the number of reportable primaries
 - New rules to determine histology coding

Quality Assurance Activities

- Coding Handbook
 - National Standards
- Visual review of cases
- Edits (Immediate entry/batch editing)
- Newsletter
- Reabstracting Studies
- Case Ascertainment Audits
- Training Workshops
- Outside Audits
- Data Submissions to National Partners
- Certification

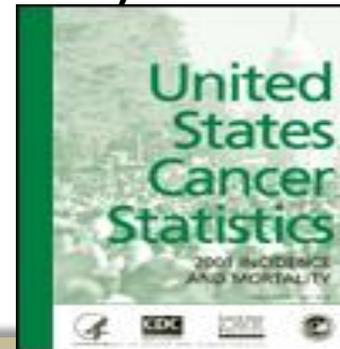


2009 CDC Audit of the
Arizona Cancer Registry
Data Completeness and
Quality Audits
Case Completeness = 95.6
Data Accuracy Rate = 95.29

National Program of Cancer Registries

Centers for Disease Control and Prevention

- To provide funds to enhance registries
- To implement new registries
- To develop model legislation and regulations
- To set standards for completeness, timeliness, and quality
- To provide training
- Cancer Surveillance System (NPCR-CSS)

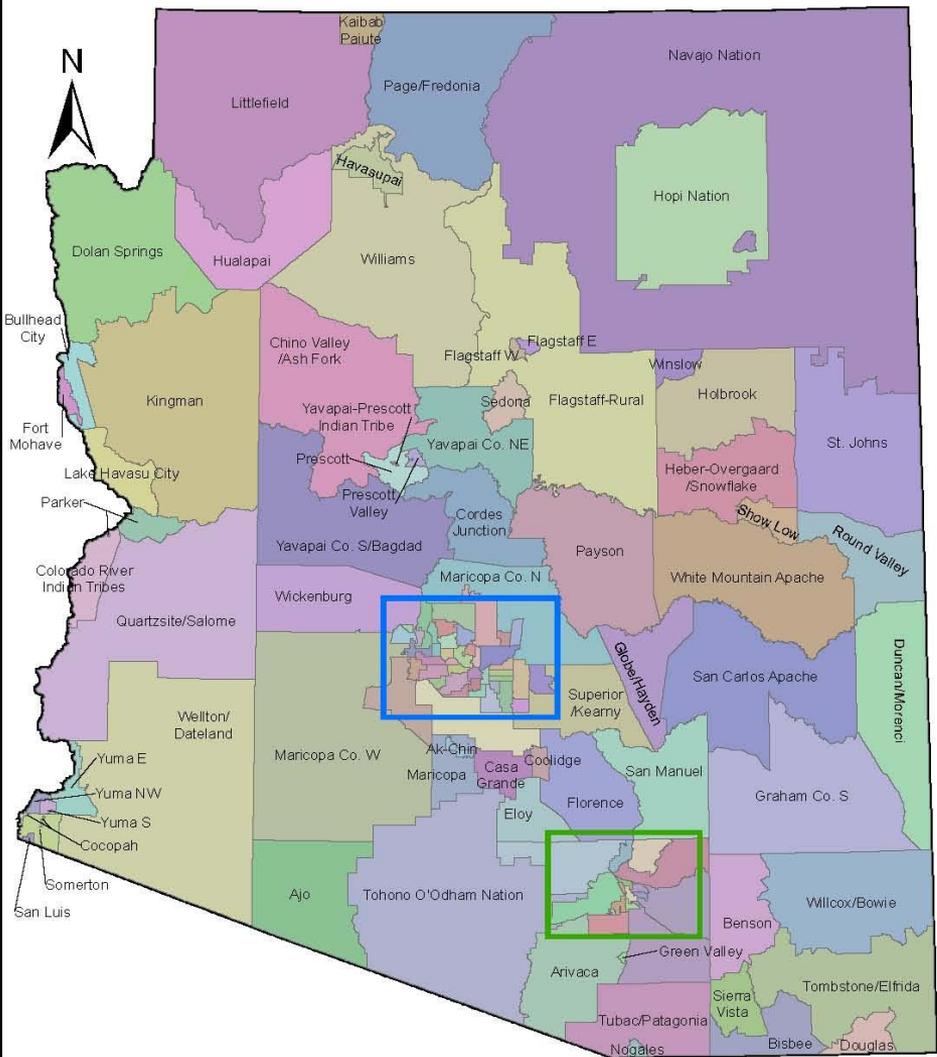


Data Use Examples

Community Health Analysis Areas

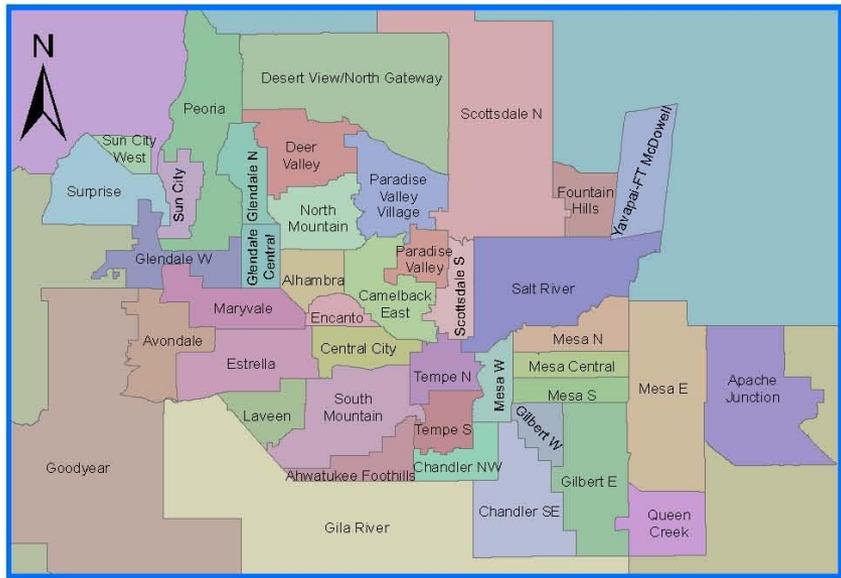
- Created to facilitate epidemiological analysis of populations at the community level
- Help pinpoint populations that may need further investigation
 - AZ counties too large geographically and too few in number (15)
 - Zip codes adequate for mail delivery
- CHAA's (Community Health Analysis Areas)
 - 126 geographic units in Arizona
 - Primary Care Areas to begin defining boundaries
 - 2000 US Census Block Groups to estimate population denominators

Community Health Analysis Areas

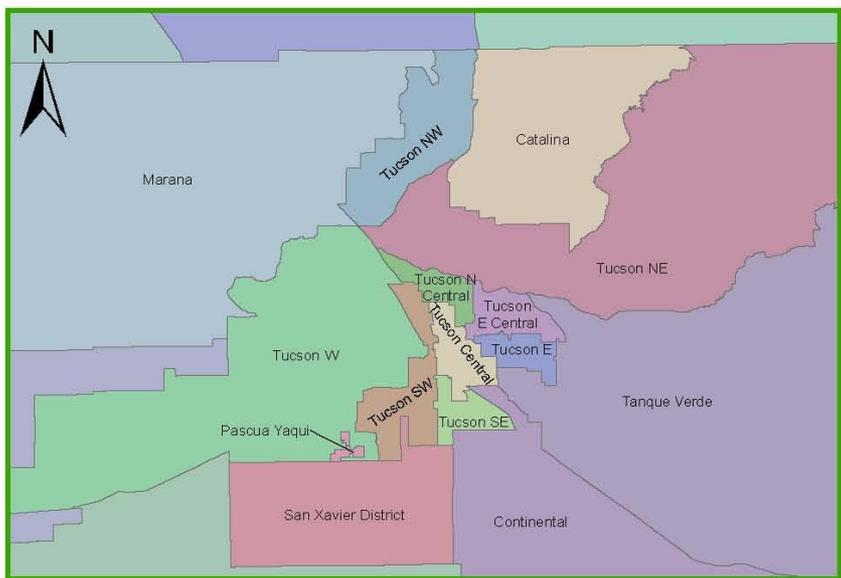


June 2005

Metro Phoenix

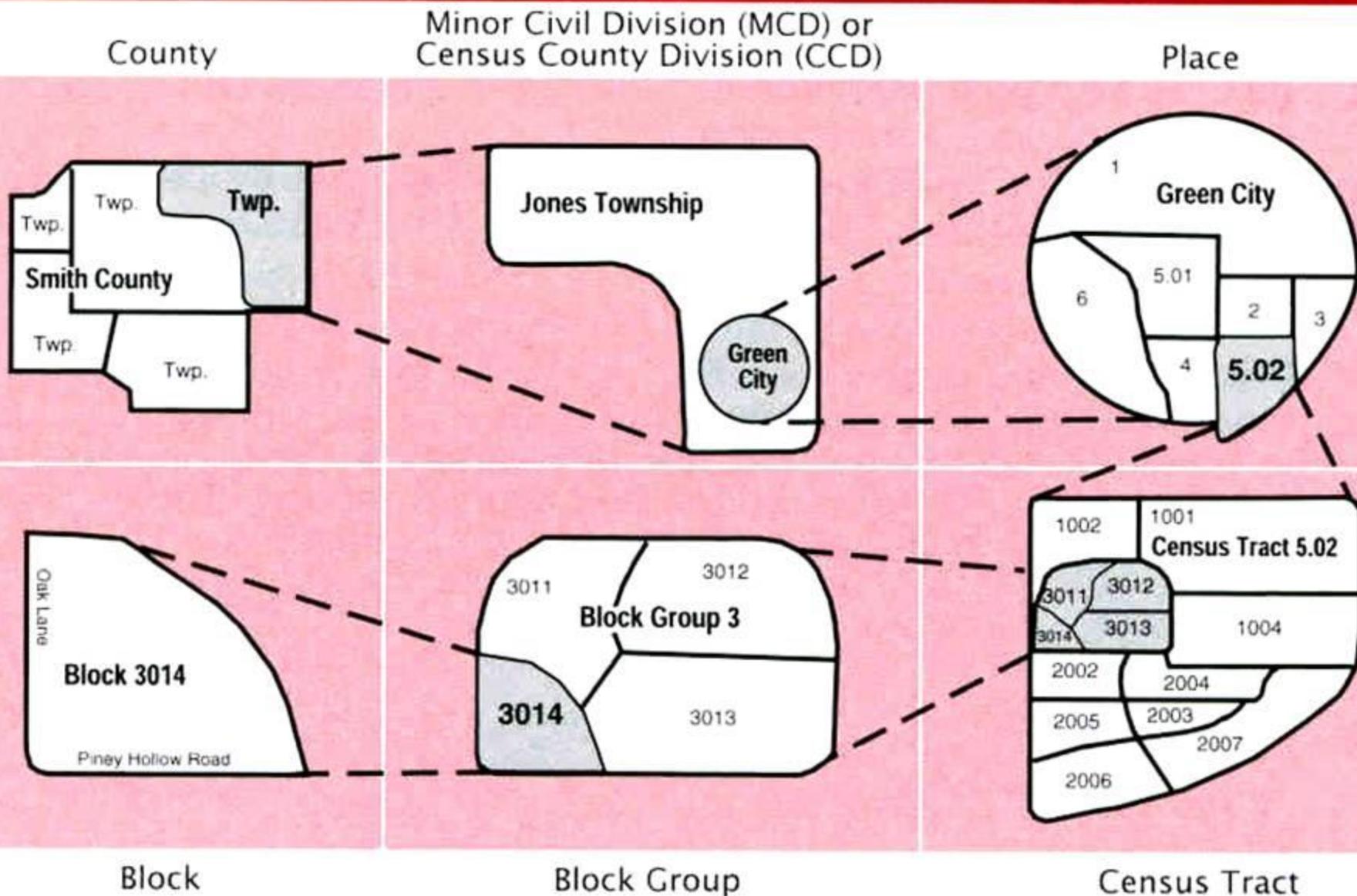


Metro Tucson

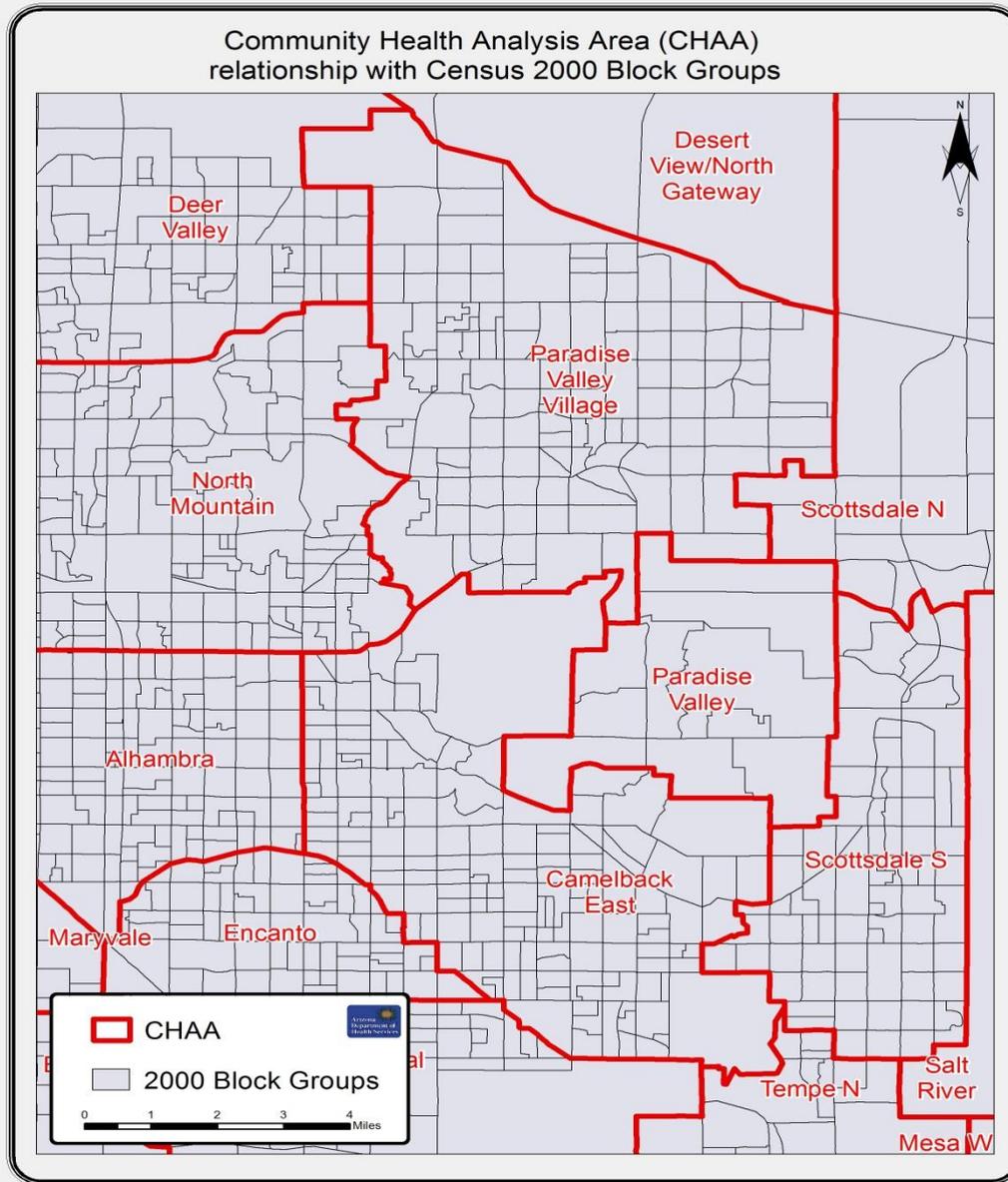


Census Small-Area Geography

Understanding the Relationships Among U.S. Census Bureau Geographic Entities



Community Health Analysis Area (CHAA) relationship with Census 2000 Block Groups



Data Use Examples

Community Health Analysis Areas

- Useful for researchers and public health administrators
 - Where to target research and programs for education, prevention and early intervention
 - Tool in identifying where the greatest need exists for services
- ID communities at risk or in need

Data Use Examples

Web-based Query System

- Provides public access to aggregate data and statistics
 - Cancer and Mortality
- Cancer Data Parameters
 - Year, sex, race, geographic area, primary site
- Cancer Data Statistics
 - Count, crude rates, age adjusted rates
 - Upper and lower confidence intervals

Query Module



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Arizona Cancer Registry Database Query Module Set Selection

Path: IBIS-PH > Custom Query > AzCR

Query Module Overview

Overview

Click on the Report Selection bar for a list of available healthdata reports. Click on the report name to begin the report query module. For further explanation on the modules, click on the "Help" button to the right.

Report Selection - CANCER 1995-2008 (updated 08/17/2011)

Select from this list to query cancer incidence.

[➔ Count of Incident Cancer](#)

[Help](#)

[➔ Age-Adjusted Cancer Incidence Rates](#)

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Arizona



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Web Sites

- Department of Health Services: www.azdhs.gov
 - Cancer Registry
 - <http://azdhs.gov/phs/phstats/cancer-registry/index.htm>
- American Cancer Society: www.cancer.org
- North American Association of Central Cancer Registries: www.naaccr.org
- SEER: www.seer.cancer.gov
- CDC: www.cdc.gov/cancer/npcr
- American College of Surgeons: www.facs.org

Any questions?

Contact Information

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The Centers for Disease Control and Prevention provide support for enhancement to the registry under cooperative agreement 5U58DP003858. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention



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