Disparities in Cancer Incidence and Stage at Diagnosis

Soundarya Radhakrishnan
Statistical Supervisor
North Carolina Central Cancer Registry
State Center for Health Statistics

https://schs.dph.ncdhhs.gov/units/ccr/
Who is the NC Central Cancer Registry (NC CCR)?
Cancer is a Reportable Disease in NC

General Statute
Chapter 130A-209
Article 7

- The NC CCR was established in 1945 with legislation making cancer a reportable disease as of 1990.

- All health care providers are required by law to report eligible cases to the NC CCR within 6 months of diagnosis.

- Law authorizes the NC CCR to release cancer data for research

- NC Advisory Committee on Cancer Coordination & Control is the Advisory Board for CCR
  - Advisory Board receives updates on CCR activities
  - Advisory Board approves requests for patient contact research
  - Research with no patient contact approved by CCR & SCHS Directors
Data Sources

- Hospitals: 120 (80 with registries)
- Cancer treatment facilities (22)
- Physicians (150+)
  (Urologists/Dermatologist/Oncologists)
- Data exchange with other states
- Death certificates
- Pathology laboratories
- Nursing homes & Hospice
Cancer Data Collected by the NC CCR

- ~1.5 million cancer cases from 1990–2019 diagnosis year
- About 80,000 reports each year
- About 50,000 unique cases each year
- All 100 counties
- All cancer sites
- Treatment
- Demographics
- Stage at Diagnosis
Top Ten, Cancer Incidence Rates in 2017*

* Top Ten are chosen by rates
Top Ten, Cancer Mortality Rates in 2018*

*Top Ten are chosen by rates
NC Cancer Registry Data

Incidences Data
- 2017
- 5-year Aggregated: 2013-2017

Mortality Data
- 2018
- 5-Year Aggregated: 2014-2018

Top 4 Sites
- Female Breast (includes in situ)
- Prostate
- Lung/Bronchus
- Colon/Rectum
Number of New Cases Diagnosed in North Carolina in 2017

<table>
<thead>
<tr>
<th>Location</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Breast</td>
<td>10,625</td>
<td></td>
</tr>
<tr>
<td>Lung/Bronchus</td>
<td>4,293</td>
<td>3,801</td>
</tr>
<tr>
<td>Prostate</td>
<td>7,432</td>
<td></td>
</tr>
<tr>
<td>Colon/Rectum</td>
<td>2,049</td>
<td>2,242</td>
</tr>
</tbody>
</table>
2012-2016 Cancer Incidence Rates
NC vs U.S

- Female Breast: 132 NC, 125 U.S.
- Lung/Bronchus: 69 NC, 59 U.S.
- Prostate: 116 NC, 104 U.S.
- Colon/Rectum: 37 NC, 39 U.S.

Rate Per 100,000
2012-2016 Cancer Mortality Rates
NC vs U.S
NC Cancer Registry Data

- All numbers are for North Carolina residents at the time of diagnosis
- All rates are age-adjusted unless otherwise indicated
- Standard population is US 2000 Census
- Rates by Race and Ethnicity
  - Non-Hispanic Whites
  - Non-Hispanic African Americans
  - Non-Hispanic American Indians
  - Non-Hispanic Other Races (includes unknown race)
  - Hispanics
Disparities in 2013-2017 Cancer Incidence by Race/Ethnicity
Disparities in 2014-2018 Cancer Mortality by Race/Ethnicity

Rate Per 100,000

- Non-Hispanic Whites
- Non-Hispanic African Americans
- Non-Hispanic American Indians
- Non-Hispanic Other Races
- Hispanics
What is Staging?

- Answers basic questions about the extent of disease AT THE TIME INITIAL DIAGNOSIS:
  - Where did the cancer start (the primary site)?
  - Where did the cancer go (extent of disease)?
  - How did the cancer get to the other organ or structure?
    - Continuous line of cancer cells from the primary site (direct extension)
    - Cancer cells break away from primary cancer and travel through blood stream or body fluids (distant metastasis)
  - Related information is grouped into broad categories that share similar prognosis
  - The higher the stage, the greater the extent of involvement, and in general, the lower the survival
Why Stage Cancer Cases?

- Allows for easier communication about the disease
- Selection of primary & adjuvant treatment
- Estimate prognosis
- Evaluate results of treatment
- **Analyze and compare groups of patients**
- Contribute to the continuing investigation of human cancers
Summary
Stage

- A basic way of categorizing how far a cancer has spread from its point of origin
- General categories of in situ, local, regional and distant
- Codes range from 0 – 9
- Combines best clinical and pathological documentation
- Applies to all histologies
Stage at Diagnosis

- **0**  ➔ In situ
- **1**  ➔ Local
- **2**  ➔ Regional by Direct Extension
- **3**  ➔ Regional Lymph Nodes only involved
- **4**  ➔ Regional by both D.E. and to Reg Nodes
- **5**  ➔ Regional, NOS
- **7**  ➔ Distant Sites and/or Distant Nodes
- **9**  ➔ Unknown or Not Applicable
NC Female Breast Cancer Mortality (2007-2018)
Female Breast Cancer Summary

**Incidence Rates:**
- Increased in NH Other Races
- Declined in Hispanics
- Remained Fairly stable for others

**Mortality Rates:**
- Increased in Other Races and Hispanics
- Remained stable/decreasing in NH Whites African Americans and AI
Disparities in Female Breast Cancer Stage at Diagnosis by Race/Ethnicity
Stage at Diagnosis

Female Breast Cancer:

- Consistent across all races - More patients diagnosed at Local Stage
- More NH Whites diagnosed at local stage than other races
NC Prostate Cancer Mortality (2007-2018)
Prostate Cancer Summary

**Incidence Rates:**
- Increased for NH Other Races
- Decreased for everyone else

**Mortality Rates:**
- Decreased for all except NH Other Races which had a slight increase
Disparities in Prostate Cancer Stage at Diagnosis by Race/Ethnicity

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Local</th>
<th>Regional</th>
<th>Distant</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Hispanic Whites</td>
<td>76.7%</td>
<td>3.9%</td>
<td>6.6%</td>
<td>6.6%</td>
</tr>
<tr>
<td>Non-Hispanic African Americans</td>
<td>77.0%</td>
<td>4.3%</td>
<td>7.9%</td>
<td>7.7%</td>
</tr>
<tr>
<td>Non-Hispanic American Indians</td>
<td>78.7%</td>
<td>4.2%</td>
<td>5.2%</td>
<td>4.3%</td>
</tr>
<tr>
<td>Non-Hispanic Other Races</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanics</td>
<td>72.1%</td>
<td>6.6%</td>
<td>13.6%</td>
<td>7.7%</td>
</tr>
</tbody>
</table>

Note: The percentages represent the proportion of each stage at diagnosis for the respective race/ethnicity group.
Stage at Diagnosis

Prostate Cancer:

- Consistent across all races (except NH Others*)
- More patients diagnosed at Local Stage
- * NH Others: More patients have Unknown Stage (Could be due to lack of stage data)
NC Lung/Bronchus Cancer Mortality (2007-2018)
Lung/Bronchus Cancer Summary

**Incidence Rates:**
- Decreased NH Whites and African Americans
- Increased for everyone else

**Mortality Rates:**
- Decreased for NH Whites and African Americans
- Remained Stable for others
Disparities in Lung/Bronchus Cancer Stage at Diagnosis by Race/Ethnicity

Non-Hispanic Whites
- Local: 22.8%
- Regional: 18.7%
- Distant: 25.6%
- Unknown: 18.3%

Non-Hispanic African Americans
- Local: 24.6%
- Regional: 18.0%
- Distant: 18.5%
- Unknown: 22.0%

Non-Hispanic American Indians
- Local: 23.4%
- Regional: 18.7%
- Distant: 18.0%
- Unknown: 21.4%

Non-Hispanic Other Races
- Local: 6.1%
- Regional: 6.2%
- Distant: 5.7%
- Unknown: 5.6%

Hispanics
- Local: 47.7%
- Regional: 50.5%
- Distant: 50.7%
- Unknown: 57.6%

Local | Regional | Distant | Unknown
Stage at Diagnosis

Lung/Bronchus Cancer:

• More patients diagnosed at Distant Stage for all races
• More Whites diagnosed at local stage than other races
NC Colon/Rectum Cancer Mortality (2007-2018)
Colon/Rectum Cancer Summary

Incidence Rates:
- Decreased for NH Whites and African Americans
- Increased for AI and NH Other races
- Remained stable for Hispanics

Mortality Rates:
- Decreased for NH Whites and African Americans
- Increased for AI and Hispanics
- Remained Stable for NH other Races
Disparities in Colon/Rectum Cancer Stage at Diagnosis by Race/Ethnicity

![Bar Chart](chart.png)

- **Non-Hispanic Whites**
  - Local: 35.4%
  - Regional: 34.5%
  - Distant: 32.7%
  - Unknown: 31.9%

- **Non-Hispanic African Americans**
  - Local: 37.9%
  - Regional: 33.5%
  - Distant: 34.7%
  - Unknown: 27.7%

- **Non-Hispanic American Indians**
  - Local: 21.0%
  - Regional: 25.8%
  - Distant: 23.3%
  - Unknown: 15.5%

- **Non-Hispanic Other Races**
  - Local: 5.7%
  - Regional: 6.2%
  - Distant: 9.4%
  - Unknown: 24.9%

- **Hispanics**
  - Local: 5.7%
  - Regional: 22.0%
  - Distant: 39.7%
  - Unknown: 32.6%
Stage at Diagnosis

Colon/Rectum Cancer:

- Patients diagnosed at local and regional stages
- More NH Others have unknown stage
Potential Uses of CCR Data

- Statewide cancer control planning and intervention
- Health care policy and decision making
- Data requests:
  - county/race/ethnicity/age/stage at diagnosis
  - Patient contact studies (Rapid Case Ascertainment)
  - Epidemiologic research: ex. Case control studies
  - Data linkages for research studies
- “Suspected” cancer cluster investigations
- North American Association of Central Cancer Registries (NAACCR)
- Center for Disease Control & Prevention (CDC)
  - National Program of Cancer Registries (NPCR)
Data Use – CCR Publications

- Cancer Profiles for all 100 Counties
- Cancer Incidence by County & by Primary Sites (MAPS)
- Cancer Incidence Annual Report for NC
- Age-adjusted Cancer Incidence Rates
- Age-adjusted Cancer Mortality Rates
- Cancer Projections for North Carolina
- Cancer Survival for Selected Sites
- Cancer Fact Sheets
National Recognition
for Submitting Timely, Complete, High-Quality Data

CDC-NPCR
Registry of Excellence
Registry of Distinction
Registry of Surveillance

NAACCR
Gold Certification
Acknowledgements

The Centers for Disease Control and Prevention for its support of the staff and the resources to produce this presentation, under cooperative agreement NC U58/DP006281-03 awarded to the North Carolina Central Cancer Registry.

The content is solely the responsibility of the authors and does not necessarily represent the official views of the Centers for Disease Control and Prevention.

NC CCR Staff for their analysis.
THANK YOU!

North Carolina Central Cancer Registry
State Center for Health Statistics
Division of Public Health
Department of Health and Human Services
1908 Mail Service Center
Raleigh, NC 27699-1908
schs.dph.ncdhhs.gov