



SEER 2014 Training Assessment for AJCC TNM Staging

Annie Noone, MS

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Outline

- Goals of the Study
- Study Design
- Results
- Results from Previous Studies
- Discussion



Motivation

- In 2016, registry community will directly assign AJCC T, N, M components of stage
- Several previous studies have shown cancer registrars may need additional training



Goals

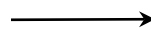
- Estimate how often data elements in medical record
- Identify training needs
- Provide a baseline to evaluate future training materials

Study Design

Original case files: Breast, colon, lung, ovary, prostate
2013 diagnosis year
56 for each site, 280 total



Redact documented staging
info from medical records



Pathologic T, N, M
Clinical T, N, M
AJCC 7th group stage (P & C)
SS2000
PSA & Gleason (not redacted)

Keep redacted info for analysis



2 reviewers assign staging
elements

Participant reviews cases and
assigns staging elements

3rd reviewer adjudicates

How Often Elements were Found in the Medical Record

Percentage of cases with element in record by site

| | Breast | Colon | Lung | Ovary | Prostate | Total |
|--------------|--------|-------|------|-------|----------|-------|
| Clinical T | 21 | 5 | 32 | 2 | 53 | 23 |
| Clinical N | 21 | 5 | 32 | 2 | 33 | 19 |
| Clinical M | 16 | 5 | 32 | 2 | 35 | 18 |
| Pathologic T | 88 | 88 | 36 | 61 | 56 | 66 |
| Pathologic N | 86 | 86 | 36 | 59 | 56 | 65 |
| Pathologic M | 63 | 63 | 16 | 27 | 32 | 40 |

Multiple Staging Values in the Medical Record

- Among records where the data element was found, many records had multiple occurrences with different values
 - 25% for clinical T and TNM path stage group
 - 6% for clinical M
- Abstractors will need to check/verify or independently assign staging data even if it is present in the medical records

Participant Characteristics

N=843

| | N | % |
|--|-------------|------|
| Location of registrar | | |
| CoC Hospital | 461 | 54.7 |
| Non CoC Hospital | 105 | 12.5 |
| Central Registry | 277 | 32.9 |
| Number of cases abstracted per year | | |
| <250 | 230 | 27.3 |
| 250-500 | 220 | 26.1 |
| >500 | 318 | 37.7 |
| Unknown | 75 | 8.9 |
| Years of experience abstracting | | |
| Mean (Range) | 11.5 (0-42) | |

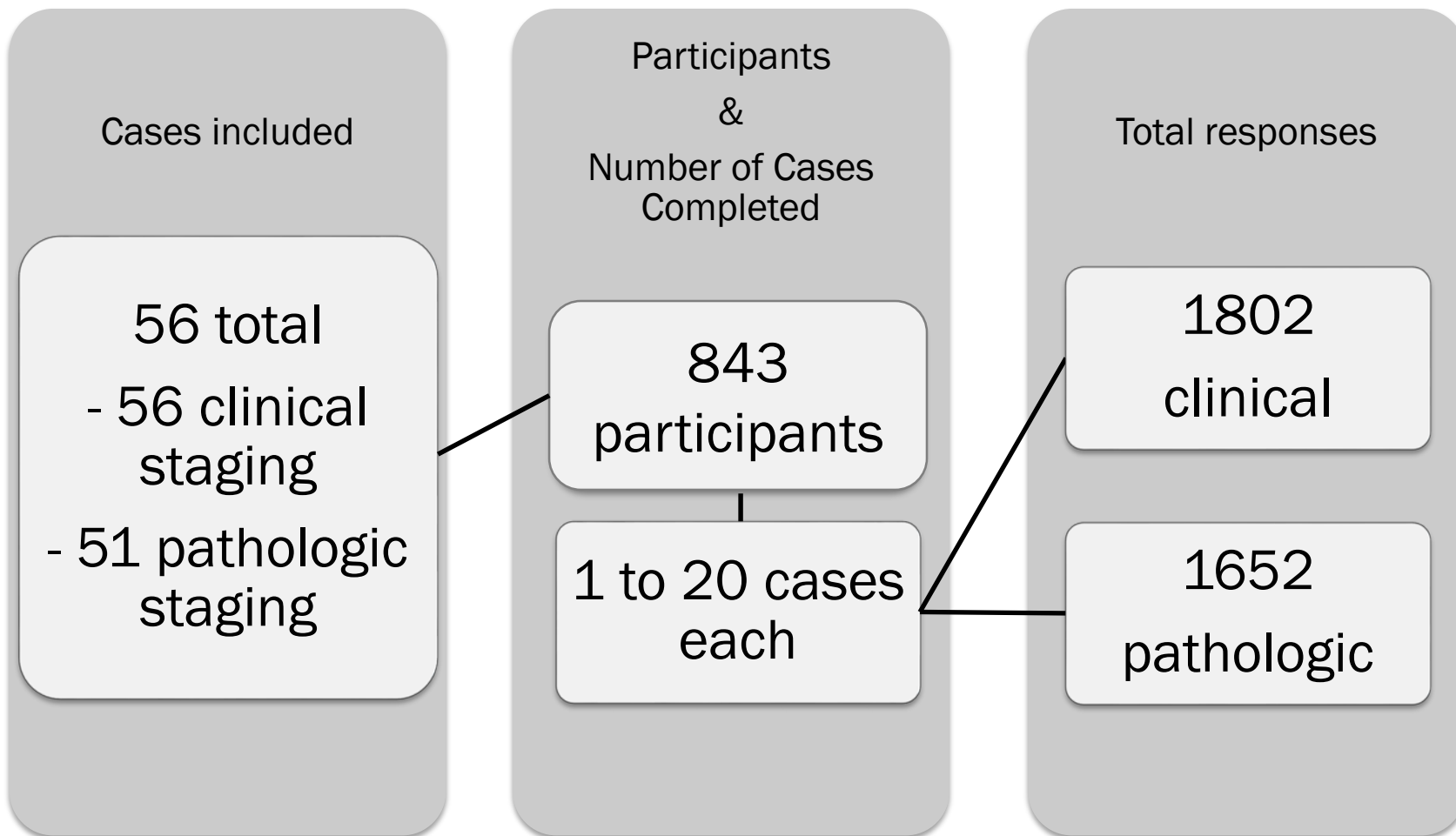
| | N | % |
|---|-----|------|
| Reported regularly assigning TNM stage | | |
| Yes | 563 | 66.8 |
| No | 274 | 32.5 |
| Unknown | 6 | 0.7 |
| Recently completed some TNM training | | |
| Yes | 146 | 17.3 |
| No | 691 | 82.0 |
| Unknown | 6 | 0.7 |

Accuracy of Directly Coded TNM

1. Agreement with the preferred answer for each element considered across all cases
2. Percentage of study cases that were consistently coded across study participants

Example

Breast cancer



Example

Breast cancer pathologic T

| Participant | Preferred Answer | | | | | | | | | | | | | | Tis | Tis |
|---------------|------------------|----|-----|-----|-----|-----|------|----|----|----|-----|-----|-----|----|------------|-----------|
| | Answer | T0 | T1 | T1a | T1b | T1c | T1mi | T2 | T3 | T4 | T4a | T4b | T4d | TX | Tis (DCIS) | (Paget's) |
| T0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| T1 | 0 | 0 | 8 | 5 | 16 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| T1a | 0 | 0 | 132 | 7 | 44 | 1 | 22 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 6 | 0 |
| T1b | 0 | 0 | 0 | 89 | 7 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| T1c | 0 | 0 | 7 | 4 | 461 | 1 | 30 | 0 | 0 | 0 | 24 | 0 | 1 | 0 | 3 | 0 |
| T1mi | 0 | 0 | 9 | 7 | 3 | 22 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| T2 | 0 | 0 | 10 | 1 | 8 | 3 | 408 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| T3 | 0 | 0 | 0 | 2 | 5 | 0 | 11 | 14 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| T4 | 0 | 0 | 1 | 0 | 0 | 0 | 5 | 6 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| T4a | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| T4b | 0 | 0 | 0 | 0 | 1 | 0 | 6 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 |
| T4d | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TX | 0 | 0 | 2 | 2 | 1 | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 27 | 1 | 0 | 0 |
| Tis | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 4 | 0 |
| Tis (DCIS) | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 109 | 0 |
| Tis (Paget's) | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 15 | 0 |

Agreement = $(132+89+461+22+408+14+5+27+3+109) / 1652 = 77\%$

Percent Agreement for All Respondents and those who Regularly Assign TNM

| | Breast | | Colon | | Lung | | Ovary | | Prostate | |
|--------------|--------|--------|-------|--------|------|--------|-------|--------|----------|--------|
| | Reg | | Reg | | Reg | | Reg | | Reg | |
| | All | Assign | All | Assign | All | Assign | All | Assign | All | Assign |
| Clinical T | 59 | 61 | 60 | 60 | 60 | 60 | 27 | 28 | 64 | 66 |
| Clinical N | 76 | 77 | 52 | 52 | 72 | 71 | 55 | 56 | 79 | 82 |
| Clinical M | 98 | 98 | 91 | 91 | 87 | 88 | 87 | 87 | 96 | 95 |
| Pathologic T | 77 | 78 | 76 | 76 | 72 | 74 | 47 | 48 | 70 | 70 |
| Pathologic N | 69 | 67 | 84 | 86 | 83 | 85 | 80 | 80 | 84 | 84 |
| Pathologic M | 99 | 99 | 85 | 86 | 88 | 89 | 81 | 81 | 99 | 99 |
| SS2000 | 89 | 90 | 67 | 67 | 76 | 76 | 59 | 60 | 84 | 83 |

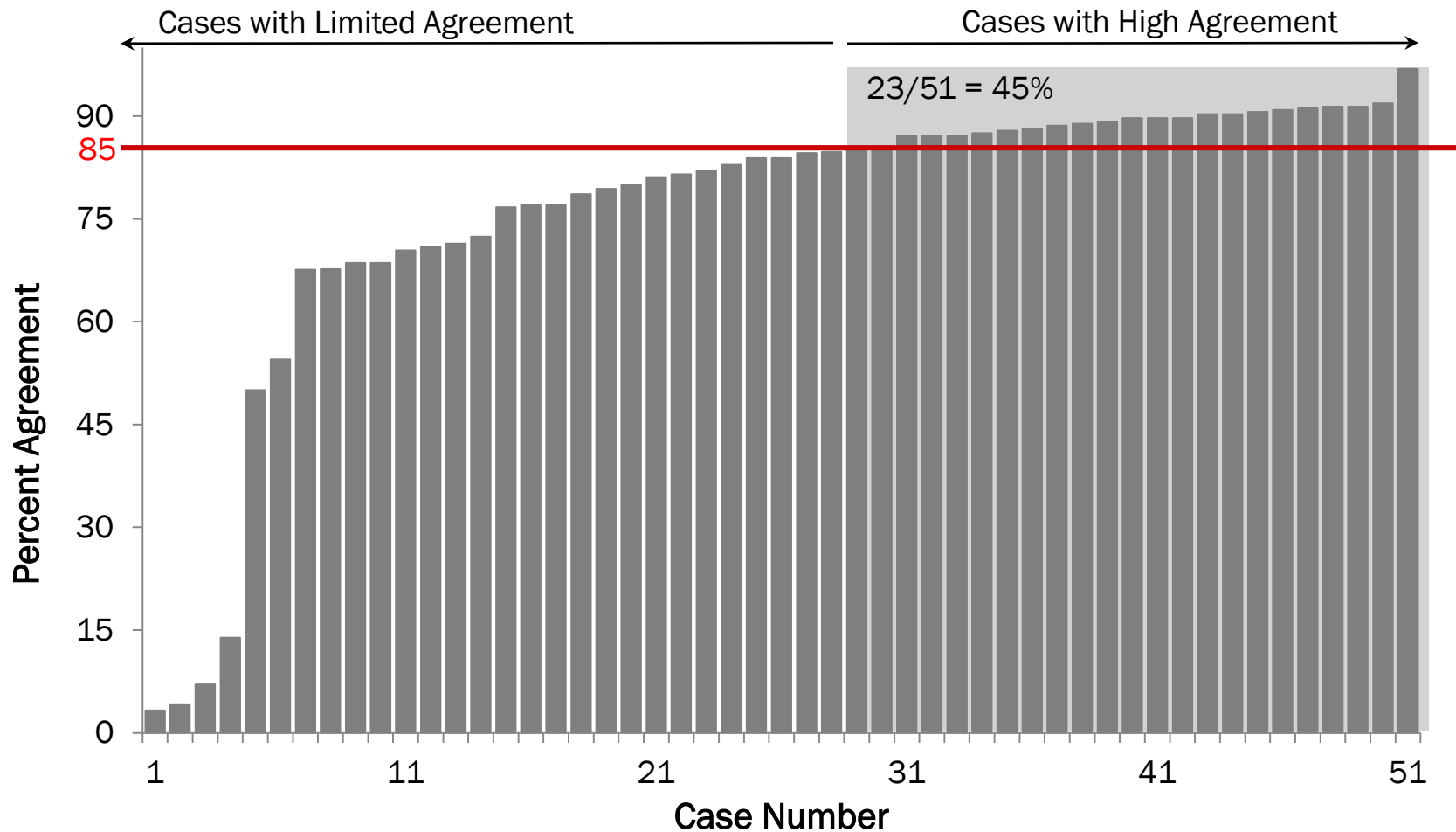


Assessing the Percent of Cases That Were Consistently Coded

- Each case was staged by at least 30 study participants
- To investigate if the disagreement was focused on a few cases or found across the majority of cases

Example

Breast cancer pathologic T



Percent of Cases with $\geq 85\%$ Agreement

| | Breast | Colon | Lung | Ovary | Prostate |
|--------------------|--------|-------|------|-------|----------|
| Clinical T | 13 | 6 | 25 | 2 | 25 |
| Clinical N | 50 | 16 | 36 | 7 | 63 |
| Clinical M | 96 | 79 | 61 | 68 | 91 |
| Pathologic T | 45 | 55 | 52 | 4 | 32 |
| Pathologic N | 26 | 59 | 70 | 53 | 68 |
| Pathologic M | 98 | 77 | 74 | 51 | 97 |
| Summary Stage 2000 | 75 | 41 | 52 | 11 | 64 |

*Each case was staged by an average of >30 participants



Study Limitations

- Possible that not all parts of the record were available
- Volunteer sample of participants
- After adjudication, preferred answers were fixed

Comparison with Similar Analyses

Looking at Directly Assigned TNM

1. NCRA Educational Needs Assessment: Preparing for Direct Coding of the AJCC TNM Staging

Donna Gress and Jim Hofferkamp

2. Comparison of CS derived and directly assigned TNM in the NCDB

Leon Sun, Kathy Cronin, Serban Negoita, Anna Lin,
Ahmedin Jemal, Jerri Linn Phillips

NCRA Educational Needs Assessment

- 185 participants
 - 91 reported working with AJCC TNM staging on a regular or somewhat regular basis
- Consisted of a series of questions, vignettes, and sample cases to test knowledge of TNM coding
- Based on typical cases

Results from NCRA survey

Percent answering correctly

- What information is included in pathologic staging?
Hospital 40%, Central 42%
- What information is included in clinical staging?
Hospital 78%, Central 56%
- A patient has a bone scan which showed metastatic disease. What should be recorded in the "pathologic M" data field?
Hospital 81% , Central 44%
- A breast patient had a core needle biopsy of the breast with ductal carcinoma and a sentinel node biopsy with 4 nodes negative. A month later the patient had a simple mastectomy. How would you code the cN and the pN?
Hospital 70%, Central 55%

Results from NCRA survey

Percent answering correctly

Hospital Registrar (H), Central Registrar (C)

| | Breast | | Colon | | Lung | | Prostate | |
|-----------------------|--------|----|-------|----|------|----|----------|----|
| | H | C | H | C | H | C | H | C |
| Clinical T | 87 | 72 | 69 | 65 | 56 | 46 | 59 | 56 |
| Clinical N | 67 | 59 | 37 | 44 | 63 | 52 | 93 | 85 |
| Clinical M | 86 | 75 | 84 | 72 | 82 | 68 | 89 | 82 |
| Pathologic T | 79 | 60 | 90 | 82 | 12 | 11 | 86 | 0* |
| Pathologic N | 37 | 26 | 97 | 94 | 8 | 7 | 97 | 17 |
| Pathologic M | 21 | 47 | 22 | 48 | 74 | 46 | 22 | 10 |
| AJCC Group Path Stage | 79 | 64 | 86 | 77 | 53 | 41 | 86 | 4* |
| AJCC Group Clin Stage | 52 | 46 | 72 | 70 | 52 | 42 | 74 | 64 |
| Summary Stage 2000 | 89 | 80 | 47 | 56 | 49 | 48 | 84 | 7* |

*77% of central registrars did not answer

Comparison of CS Derived and Directly Assigned TNM in NCDB

- Cases diagnosed in 2010 and 2011 for lung, breast and colon cancer
- Derived Clinical and Pathologic TNM was based on the CS eval codes
- Comparisons were made on three levels
 - **Subcategory match**
 - TNM subcategories (for example, T1a, N1b, etc.)
 - **Collapsed category match**
 - Major T and N categories (for example, T1, N1, etc.)
 - **M0/Mx vs. M+** (whether or not metastatic disease was found)

Results of NCDB Comparison

Percent Agreement

| | Subcategory | | | Collapsed Category | | M0/ Mx vs M+ |
|-------------------|-------------|-----|-----|--------------------|---------------------|-----------------|
| | T | N | M | T | N | M |
| Clinical | | | | | | |
| Breast | 80% | 86% | 99% | 88% | 89% | 99.6% |
| Lung | 74% | 90% | 82% | 83% | Same as subcategory | 98.3% |
| CRC | 84% | 79% | 93% | 87% | 84% | 96.5% |
| Pathologic | | | | | | |
| Breast | 91% | 71% | | 96% | 97% | |
| Lung | 80% | 95% | | 92% | Same as subcategory | |
| CRC | 93% | 86% | | 95% | 97% | |

Caution in Comparing CS and Directly Coded TNM

From FORDS manual:

“As a “best stage” system, CS makes use of the most complete information available to stage the tumor. The *AJCC Cancer Staging Manual* distinguishes between clinical staging, based on information available prior to primary treatment, and pathologic staging, based on information gathered as a product of the treatment process (particularly surgery). It also has specific rules governing how the components gathered at different times in the process may be combined.”

Discussion

- Staging elements not often in medical record
 - In conflict with other information
- Agreement between participant and preferred responses
 - Few cases that had all data elements assigned in agreement with preferred response

Discussion

- Results of this study in agreement with two previous studies
- Future quality of staging data
 - Adequate training needed
 - Evaluation of training effectiveness

Next Steps

- Opened June 1!

SEER 2015 Assessment of Building Blocks
for Stage for Transition from Collaborative
Stage

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