

ACS Cancer Conference 2025

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Analyzing The Missing Clinical Stage Data on NCDB: A Large Population-Based Cohort of Non-Small Cell Lung Cancer from 2004 to 2022

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Disclosures

- None

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Why investigate the Clinical Stage missing data at NCDB?

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EDITORIAL – HEALTH SERVICES RESEARCH AND GLOBAL ONCOLOGY

What's Lost in What's Missing: A Thoughtful Approach to Missing Data in the National Cancer Database

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National Cancer Data Base (NCDB) is an invaluable source of information

We aim to characterize the missing clinical stage data within the NCBD from 2004 - 2022.

Methods

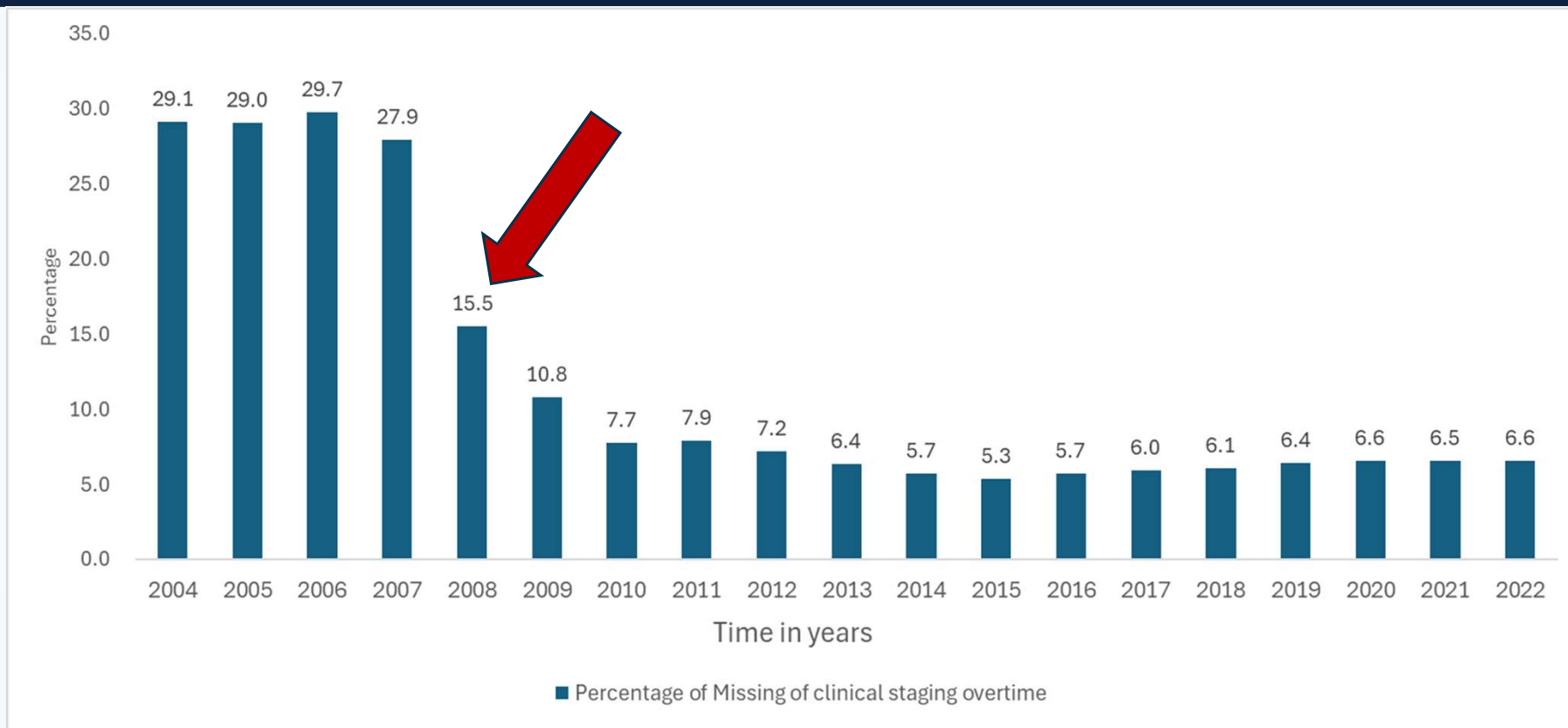
Trends analysis

ANOVA, Chi-square, and t-tests



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Missing at Clinical Stage decreased significantly after 2008



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- Starting in 2008, there was a change in the staging rules.
- Cancer registrars were allowed to stage the cases

STAGED BY (CLINICAL STAGE)

Item Length: 1
Allowable Values: 0–9
NAACCR Item #990
Revised 09/06, 01/08, 09/08, 01/10

Description

Identifies the person who documented the clinical AJCC staging elements and the Stage Group.

Rationale

Effective January 1, 2008 the CoC requires that AJCC clinical TNM staging be recorded in its accredited cancer program cancer registries. Data captured in this field can be used to evaluate the accuracy and completeness of staging recorded in the registry and form the basis for quality management and improvement studies.

Instructions for Coding

- Record the person who documented the clinical AJCC staging elements and the Stage Group.
- If code 1, 2, or 5 is used, then all of the staging elements (T, N, and M) and Stage Group must be recorded by the same person.
- The staging elements (T, N, M) and the Stage Group must be recorded.

Code	Label	Definition
0	Not staged	Clinical staging was not assigned.
1	Managing physician	Clinical staging was assigned by the managing physician.
2	Pathologist	Clinical staging was assigned by the pathologist only.
3	Pathologist and managing physician	Clinical staging was assigned by the pathologist and the managing physician.
4	Cancer Committee chair, cancer liaison physician, or registry physician advisor	Clinical staging was assigned by the Cancer Committee chair, cancer liaison physician, or the registry physician advisor during a quality control review.
5	Cancer registrar	Clinical staging was assigned by the cancer registrar only.
6	Cancer registrar and physician	Clinical staging was assigned by the cancer registrar and any of the physicians specified in codes 1–4.
7	Staging assigned at another facility	Clinical staging was assigned by a physician at another facility.
8	Case is not eligible for staging	An AJCC staging scheme has not been developed for this site. The histology is excluded from an AJCC site scheme.
9	Unknown; not stated in patient record	It is unknown whether or not the case was staged.

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- Missing at Clinical Staging varied from 9.1% to 14.9 % across the variables.

		All Years Missing clinical stage		p-value			
		No	Yes		%	%	%
		n=2,028,221	n=255,594		11.2		
Facility type				<0.0001		-	-
	Community Cancer Program	154,221	16,094		9.4	7.6	6.3
	Comprehensive Community Cancer Program	822,185	104,023		11.2	40.5	40.7
	Academic/Research Program	630,943	80,536		11.3	31.1	31.5
	Integrated Network Cancer Program	408,450	52,762		11.4	20.1	20.6
	Missing	12,422	2,179		14.9	0.6	0.9
Facility location				<0.0001		-	-
	New England	124,636	14,899		10.7	6.1	5.8
	Middle Atlantic	300,378	42,630		12.4	14.8	16.7
	South Atlantic	456,823	59,621		11.5	22.5	23.3
	East North Central	381,455	40,703		9.6	18.8	15.9
	East South Central	168,616	19,454		10.3	8.3	7.6
	West North Central	163,664	17,651		9.7	8.1	6.9
	West South Central	150,593	24,629		14.1	7.4	9.6
	Mountain	68,098	9,417		12.1	3.4	3.7
	Pacific	201,536	24,411		10.8	9.9	9.6
	Missing	12,422	2,179		14.9	0.6	0.9
Age, mean std		69	69	0.00		0.0	0.0
Sex				<0.0001		-	-
	Male	1,048,703	128,585		10.9	51.7	50.3
	Female	979,518	126,999		11.5	48.3	49.7
Race/ethnicity				<0.0001		-	-
	White non-Hispanic	1,662,242	213,852		11.4	82.0	83.7
	Black non-Hispanic	222,942	23,732		9.6	11.0	9.3
	Other non-Hispanic	61,337	6,828		10.0	3.0	2.7
	Hispanic (any race)	62,540	8,095		11.5	3.1	3.2
	Missing	19,160	3,087		13.9	0.9	1.2
Insurance status				<0.0001		-	-
	Not Insured	53,010	5,320		9.1	2.6	2.1
	Private Insurance / Managed Care	500,942	70,675		12.4	24.7	27.7
	Medicaid	136,788	12,013		8.1	6.7	4.7
	Medicare	1,266,450	157,985		11.1	62.4	61.8
	Other Government	38,387	3,867		9.2	1.9	1.5
	Insurance Status Unknown	32,655	5,734		14.9	1.6	2.2
Urban/rural				<0.0001		-	-
	Metro	1,607,247	203,287		11.2	79.2	79.5
	Urban	312,809	37,421		10.7	15.4	14.6
	Rural	44,326	5,212		10.5	2.2	2.0
	Missing	63,839	9,674		13.2	3.1	3.8

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Results

- Missing at the Facility type, race, Insurance, and urban/rural location was associated with having missing at the clinical stage variable.

	OR	CI 95%	p-value
Facility type			<0.0001
Community Cancer Program	-		
Comprehensive Community Cancer Program	1.19	1.17 1.21	
Academic/Research Program	1.19	1.17 1.21	
Integrated Network Cancer Program	1.23	1.21 1.26	
Missing	1.90	1.80 2.01	
Age, per 10 additional years	1.00	0.99 1.00	0.28
Sex			<0.0001
Male	-		
Female	1.05	1.04 1.06	
Race/ethnicity			<0.0001
White non-Hispanic	-		
Black non-Hispanic	0.85	0.84 0.86	
Other non-Hispanic	0.87	0.85 0.89	
Hispanic (any race)	1.03	1.00 1.05	
Missing	1.46	1.39 1.53	
Insurance status			<0.0001
Not Insured	-		
Private Insurance / Managed Care	1.38	1.34 1.42	
Medicaid	0.89	0.86 0.92	
Medicare	1.24	1.21 1.28	
Other Government	1.01	0.96 1.05	
Insurance Status Unknown	1.97	1.87 2.06	
Urban/rural			<0.0001
Metro	-		
Urban	0.91	0.90 0.93	
Rural	0.89	0.86 0.92	
Missing	1.31	1.27 1.36	

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Conclusions

- Identify and document the missing data
- Identify if imputation is recommended
- Identify if sensitivity analysis is recommended
- Identify if relevant selection bias is introduced by excluding the missing data.
- Report accurately the missing data as a limitation
- Strengthening the data collection and accuracy in our cancer registries is fundamental to continuously improve the quality of the research that can be done using the NCDB.

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Thank you

