# Biomarker Testing and Targeted Therapy Use Among Patients With Non-Small Cell Lung Cancer in the United States:

## An Analysis Using a Physician Notes Real-World Database

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## Introduction

- Lung cancer is one of the most common malignancies in the United States, with an estimated 234,580 new cases in 2024[1]
- Biomarker testing informs treatment decisions by identifying patients who would clinically benefit from targeted regimens[2]
- With the introduction of targeted therapy in non-small cell lung cancer (NSCLC), biomarker testing has become a standard of care for patients to identify actionable mutations in an effort to improve patient outcomes[3]
  - ~30% to 50% of patients with NSCLC harbor an actionable mutation
- However, the use of guideline-recommended biomarker testing in patients with advanced NSCLC is inconsistent[2]
- This study aims to characterize the rates of biomarker testing and subsequent treatment patterns among patients with NSCLC using a qualitative, real-world database (RWD)

## Methods

- Amplity Insights RWD
  - >60 million electronic medical transcription records from nearly 120,000 health care providers at ~40,000 inpatient/outpatient care sites across 50 states and 2 US territories
  - Natural language processing was used to search and analyze the Amplity Insights Database, composed of US-based transcribed physician notes, for patients diagnosed with NSCLC
  - This study retrospectively evaluated data from October 2003 through November 2023
- Patient records from the database were included in the analysis if they had a confirmed diagnosis of NSCLC, identified from their medical records
- Patient characteristics, biomarker testing and results, and treatment use were summarized and described

## Conclusion

- These findings suggest that biomarker testing is underutilized in patients with a confirmed diagnosis of NSCLC
- Regional differences in biomarker testing rates were observed, suggesting that other factors, such as social determinants, likely influence access to biomarker testing
- Despite having confirmed actionable mutations, patients are not receiving the appropriate targeted therapy, even when only oncology transcription records are considered
- This analysis highlights that many patients may not be benefitting from treatment with precision therapies, suggesting that there is an urgent need for additional educational strategies to optimize the adoption of precision oncology and elevate patient outcomes

DISCLOSURES
All authors are employees of Amplity Health

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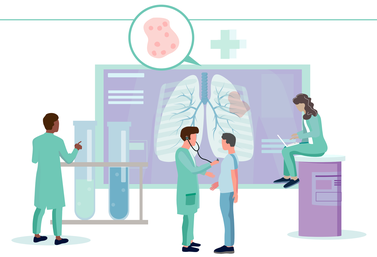
REFERENCES

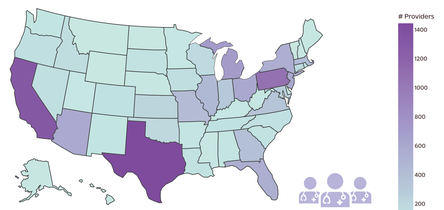
1. Siegel RL, Giaquinto AN, Jemal A. Cancer statistics, 2024 [published correction appears in *CA Cancer J Clin*. 2024; 74(2):203]. *CA Cancer J Clin*. 2024;74(1):12-49.
2. Yorio J, Lofgren KT, Lee JK, et al. Association of timely comprehensive genomic profiling with precision oncology treatment use and patient outcomes in advanced non-small-cell lung cancer. *JCO Precis Oncol*. 2024;8:e2300292.
3. Ionescu DN, Stockley TL, Banerji S, et al. Consensus recommendations to optimize testing for new targetable alterations in non-small cell lung cancer. *Curr Oncol*. 2022;29(7):4981-4997.

### Table 1: Patient demographics

| | NSCLC cohort (N=61,018) |
|---|---|
| Age, median (range) | 70, (1-105) |
| Sex, n (%) | |
| Male | 29,939 (49.4) |
| Female | 30,668 (50.6) |
| Ethnicity, n (%) | |
| African American | 3,431 (9.9) |
| Asian | 294 (0.9) |
| Hispanic | 443 (1.3) |
| Other | 7 (0.0) |
| White | 30,346 (87.9) |
| Care setting, n (%) | |
| Academic | 23,253 (40.2) |
| Community | 40,236 (69.6) |



### Geographic distribution of physician location




**12,312 total physicians with 1,356 in oncology**

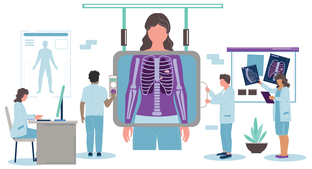
## Biomarker testing is underutilized and may not be conducted as recommended by current guidelines

### Table 2: Biomarker testing rates in patients with NSCLC

| | Overall patients (N=61,018) n (%) | Patients seen by an oncologist (N=23,845) n (%) |
|---|---|---|
| **Biomarker tested, overall** | **8,151 (13.4)** | **4,968 (20.8)** |
| Early stage (0-II) | 6,280 | 3,190 |
| Biomarker tested | 584 (9.3) | 349 (10.9) |
| Late stage (III-IV) | 17,363 | 7,818 |
| Biomarker tested | 3,281 (18.9) | 1,914 (24.5) |

13.4% of patients have evidence of biomarker testing

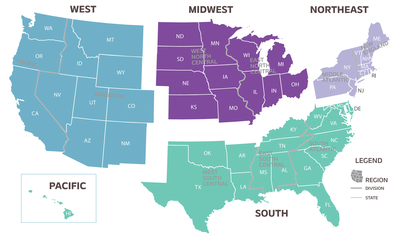
**Overall patients: N=61,018**



**Patients seen by an oncologist: N=23,845**

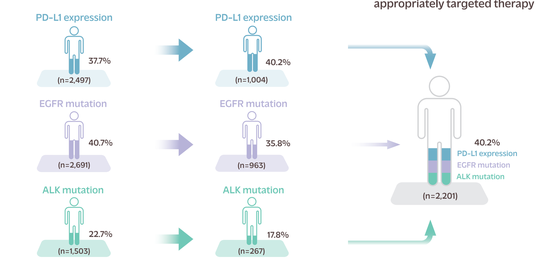
20.8% of patients have evidence of having received a biomarker test

1,707/12,833 (13.3%) | 1,834/15,468 (11.9%) | 3,410/20,223 (16.9%)




1,759/16,558 (10.6%)

## Among patients with confirmed actionable mutations, many are not receiving the appropriately targeted therapy




### Table 3: Treatment accuracy of all physicians managing patients with NSCLC harboring an actionable mutation, by mutation

| Characteristic | Patients with positive mutation n | Patients receiving indicated treatment[a] n (%) | Patients receiving a non-indicated treatment[b] n (%) |
|---|---|---|---|
| Mutation identified[c] | 6,387 | 2,295 (35.9) | 644 (10.1) |
| PD-L1 | 2,497 | 1,004 (40.2) | 47 (1.9) |
| EGFR | 2,691 | 963 (35.8) | 253 (9.4) |
| ALK | 1,503 | 267 (17.8) | 182 (12.1) |

[a] This included patients who received an approved therapy for the detected mutation.
[b] This included patients who received a treatment that was not approved for any possessed mutation.
[c] This included patients who had an actionable mutation.

**Of the 6,387 patients with a mutation identified, only 35.9% received an indicated treatment**

### Table 4: Treatment accuracy of all physicians managing a patients with NSCLC harboring an actionable mutation, by mutation

| Characteristic | All patients n | Patients receiving indicated treatment[a] n (%) | Patients receiving chemotherapy n (%) | Patients receiving immunotherapy[b] n (%) | Patients receiving angiogenesis inhibitors[b] n (%) | Patients in palliative care n (%) |
|---|---|---|---|---|---|---|
| PD-L1 | 2,497 | 1,004 (40.2) | 1,880 (75.3) | 1,186 (47.5) | 375 (15.0) | 993 (39.8) |
| EGFR | 2,691 | 963 (35.8) | 1,798 (66.8) | 469 (17.4) | 640 (23.8) | 780 (29.0) |
| ALK | 1,503 | 267 (17.8) | 1115 (74.2) | 340 (22.6) | 413 (27.5) | 440 (29.3) |

[a] This included patients who received an approved therapy for the detected mutation.
[b] This included patients who received a treatment that was not approved for any mutation they had.

### Summary of therapies received by patients harboring confirmed actionable mutations, specific to mentions made by oncologists