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Mapping the Burden of Lung Cancer: Sociodemographic and Clinicopathological insights from a Tertiary care Hospital

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ABSTRACT

BACKGROUND: Lung cancer remains one of the leading causes of cancer-related morbidity and mortality worldwide, with its burden influenced by sociodemographic factors, lifestyle patterns, and clinicopathological diversity. Understanding disease characteristics within regional healthcare settings is essential for improving early diagnosis and optimizing treatment strategies.

OBJECTIVES: To map the burden of lung cancer by analyzing its sociodemographic, clinical, pathological, and radiological patterns among patients attending a tertiary care hospital.

METHODS: A one-year hospital-based observational study was conducted in the Department of Pulmonary Medicine at Sree Balaji Medical College & Hospital (Nov 2024–Nov 2025). Adults (≥18 years) with clinically, radiologically, and histopathologically confirmed lung cancer who consented were included. Demographic, clinical, exposure, radiological, histopathological, staging, metastatic, and molecular data (ALK, EGFR, PD-L1) were collected using a structured proforma. Statistical analysis was performed using SPSS v20.0; continuous variables were expressed as mean ± SD or median (IQR), categorical variables as percentages, and associations assessed using Chi-square, Fisher's exact, t-test, or Mann–Whitney U test, with $p < 0.05$ considered significant

RESULTS: Among 54 lung cancer patients, most were older males with significant smoking or biomass exposure. Cough and dyspnea were the most common symptoms, and primary lung cancer accounted for 85.2% of cases, predominantly peripheral and presenting as mass lesions. Image-guided and thoracoscopic biopsies showed superior diagnostic yield. Adenocarcinoma was the leading subtype (56.5%), and most NSCLC cases were diagnosed at advanced stages. Metastasis commonly involved the contralateral lung and pleura. EGFR mutations were frequent (40.9%), while ALK and ROS1 alterations were uncommon, with actionable mutations more prevalent in females.

CONCLUSION: Lung cancer in this cohort was predominantly advanced-stage adenocarcinoma linked to smoking and biomass exposure. High diagnostic yield from image-guided procedures and a notable EGFR mutation rate highlight the importance of early detection and routine molecular testing to guide targeted treatment. Strengthening awareness and timely access to diagnostic care may further improve outcomes.

KEYWORDS: Non Small Cell Lung cancer; Smoking exposure; Molecular profiling; EGFR Mutations, Diagnostic yield.

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INTRODUCTION

Lung cancer remains one of the most significant global public health challenges, accounting for the highest number of cancer-related deaths worldwide despite advances in screening, diagnosis, and therapeutic modalities. According to recent estimates, lung cancer contributes to nearly 11.4% of all new cancer cases and 18% of cancer mortality globally, underscoring its aggressive nature and late-stage detection in the majority of patients [1]. The burden of lung cancer is shaped by multiple interacting factors, including sociodemographic influences, environmental exposures, and evolving clinicopathological trends. Tobacco smoking continues to be the leading preventable cause, responsible for more than two-thirds of lung cancer deaths, while rising incidence among never-smokers highlights the growing significance of air pollution, occupational hazards, and genetic susceptibility [2,3]. In developing countries, the burden is further amplified by delayed healthcare seeking, limited access to diagnostic facilities, and lack of awareness about early symptoms. India has witnessed a steady increase in lung cancer incidence, particularly among urban populations, with adenocarcinoma becoming the predominant histological subtype over the past decade [4]. This shift mirrors global patterns attributed to changes in smoking behavior, introduction of filtered cigarettes, and improved diagnostic capabilities [5]. Understanding sociodemographic and clinicopathological characteristics in regional settings is therefore essential to guide targeted screening strategies, early detection programs, and resource allocation.

Tertiary care hospitals serve as crucial referral centers that manage diverse patient populations and advanced disease stages, offering valuable insights into real-world patterns of lung cancer presentation. Mapping these trends helps identify high-risk groups, predominant histopathological subtypes, and common radiological features, which collectively inform clinical decision-making and public health interventions [6]. Given the heterogeneity of lung cancer across geographic and socioeconomic backgrounds, comprehensive local data remain indispensable. This study aims to explore the sociodemographic and clinicopathological profile of lung cancer in a tertiary care hospital, thereby contributing to the growing evidence base required for improving outcomes and strengthening cancer control strategies.

METHODS AND MATERIALS:

Study Design and Setting

This was a **hospital-based observational study** conducted in the Department of Pulmonary Medicine at Sree balaji Medical College & Hospital, Chromepet, Tamil Nadu, India. The study included all eligible patients diagnosed with lung cancer during the defined study period of 1 year from November 2024 – November 2025. Informed consent was obtained from all participants.

Study Population

All consecutive adult patients presenting to the outpatient department, inpatient wards, or referrals who were diagnosed with lung cancer based on clinical evaluation, radiological imaging, and histopathological confirmation who met the inclusion criteria were enrolled in the study.

Inclusion Criteria

1. Patients aged **18 years and above.**
2. Patients with a **confirmed diagnosis of lung cancer** based on cytology or histopathology (bronchoscopic biopsy, CT-guided transthoracic needle biopsy, pleural fluid cytology, or surgical biopsy).
3. Patients willing to provide informed consent and complete clinical information.

Exclusion Criteria

1. Patients who left against medical advice or were **lost to follow-up before baseline evaluation.**
2. Patients with **severe moribund status** preventing completion of diagnostic evaluation.

Data Collection Procedure

Data were collected using a structured proforma capturing age, gender, family history, comorbidities (DM, HTN, CAD, CVA, CKD, COPD, prior pulmonary TB), smoking status, type of smoke or non-smoke exposure, pack-years, and smoking index. Clinical details included ECOG status, presenting symptoms, and symptom duration. Radiological assessment (X-ray and CECT thorax) documented side and lobe involvement, central or peripheral location, and lesion patterns (mass, nodule, collapse, hilar prominence, effusion, nodules, cavitation). Diagnostic procedures included bronchoscopy, image-guided biopsy, thoracoscopy, and cytology. Histopathological classification covered major primary lung cancer types, secondary tumors, and staging (AJCC for NSCLC; limited/extensive for SCLC). Metastatic sites and molecular markers (ALK, EGFR, PD-L1) were also recorded.

Statistical Analysis

Data were entered into **Microsoft Excel** and analyzed using **SPSS software versionv20.0 (IBM Corp., Armonk, NY)**. Continuous variables were summarized as mean ± SD or median (IQR), while categorical variables were presented as frequencies and percentages. Associations between variables were tested using the Chi-square or Fisher's exact test, and group comparisons for continuous variables used the Student's t-test or Mann–Whitney U test. A p-value < 0.05 was considered statistically significant.

RESULTS

Demographic, Clinical and Exposure Characteristics:

A total of 54 patients were included in the study. Most patients belonged to the older age groups, with 20 (37%) in the 60–70-year range, 13 (24.1%) aged 50–60 years, and 11 (20.4%) aged 70–80 years, while only 2 (3.7%) were <40 years and 3 (5.6%) were >80 years. Males predominated, accounting for 38 (70.4%) patients, while females comprised 16 (29.6%). A family history of cancer was present in 12 (22.2%) patients. Comorbidities were frequent, with hypertension reported in 22 (40.7%), diabetes mellitus in 17 (31.5%), COPD in 12 (22.2%), CAD in 9 (16.7%), CKD in 4 (7.4%), CVA in 3 (5.6%), and prior ATT for pulmonary TB in 6 (11.1%).

A total of 34 (63%) patients were smokers, with beedi smoking being most common at 18 (52.9%) among smokers, followed by cigarettes in 10 (29.4%) and mixed exposure in 6 (17.6%). Among nonsmokers (n=20), exposure to biomass fuel was present in 8 (40%), passive smoking in 5 (25%), tobacco chewing in 3 (15%), and 4 (20%) had no identifiable exposure. Pack-year distribution revealed 14 (41.2%) smokers with 20–29 pack-years, 9 (26.5%) with 30–39 pack-years, 6 (17.6%) with 10–19 pack-years, and 5 (14.7%) with >40 pack-years. Based on smoking index, 18 (52.9%) had moderate exposure, while mild and severe exposure were each observed in 8 (23.5%) patients. ECOG performance status showed that 22 (40.7%) had ECOG 1, 18 (33.3%) had ECOG 2, 10 (18.5%) had ECOG >2, and 4 (7.4%) had ECOG 0 at presentation.

Cough was the predominant presenting symptom, observed in 46 (85.2%) patients, followed by dyspnea in 38 (70.4%), weight and appetite loss in 32 (59.3%), chest pain in 20 (37%), hemoptysis in 12 (22.2%), and hoarseness of voice in 8 (14.8%). Symptom duration before diagnosis ranged from <2 weeks in 3 (5.6%) patients and 2–4 weeks in 7 (13%), to 1–6 months in 32 (59.3%),

while 12 (22.2%) had symptoms for >6 months.

Table 1: Consolidated Demographic, Clinical and Exposure Characteristics of the Study Population (n = 54)

Parameter	Category	n	%
Age (years)	<40	2	3.7
	40–50	5	9.3
	50–60	13	24.1
	60–70	20	37.0
	70–80	11	20.4
	>80	3	5.6
Gender	Male	38	70.4
	Female	16	29.6
Family History of Cancer	Yes	12	22.2
	No	42	77.8
Comorbidities	DM	17	31.5
	HTN	22	40.7
	CAD	9	16.7
	CVA	3	5.6
	CKD	4	7.4
	COPD	12	22.2
	Prior ATT for Pul TB	6	11.1
Smoking Status	Smoker	34	63.0
	Non-smoker	20	37.0
Type of Smoke Exposure (Smokers)	Cigarettes	10	29.4
	Beedi	18	52.9
	Both	6	17.6
Exposure in Non-Smokers	Biomass	8	40.0
	Passive smoking	5	25.0
	Tobacco chewing	3	15.0
	No exposure	4	20.0
Pack Years (Smokers)	10–19	6	17.6
	20–29	14	41.2
	30–39	9	26.5
	>40	5	14.7
Smoking Index	Mild (<100)	8	23.5
	Moderate (100–300)	18	52.9
	Severe (>300)	8	23.5
ECOG Score	0	4	7.4
	1	22	40.7
	2	18	33.3
	>2	10	18.5
Symptoms at Onset	Cough	46	85.2
	Shortness of breath	38	70.4
	Hemoptysis	12	22.2
	Chest pain	20	37.0
	Weight & appetite loss	32	59.3
	Hoarseness of voice	8	14.8
Duration of Symptoms	<2 weeks	3	5.6
	2–4 weeks	7	13.0
	1–6 months	32	59.3
	>6 months	12	22.2

Lesion & Imaging Profile:

Regarding cancer characteristics, **primary lung cancer** accounted for 46 (85.2%) patients, while **secondary (metastatic) lung involvement** was seen in 8 (14.8%). **Peripheral lesions** were more common, seen in 33 (61.1%) patients, compared to 21 (38.9%) with central lesions. Radiologically, the most common finding was a **mass lesion** in 32 (59.3%) patients, followed by **nodules** in 10 (18.5%), **lung collapse** in 8 (14.8%), **hilar prominence** in 6 (11.1%), **pleural effusion** in 8 (14.8%), **pleural nodules** in 8 (14.8%), and **cavitatory lesions** in 4 (7.4%). These findings reflect the heterogeneous manner in which lung cancer may present clinically and radiologically.

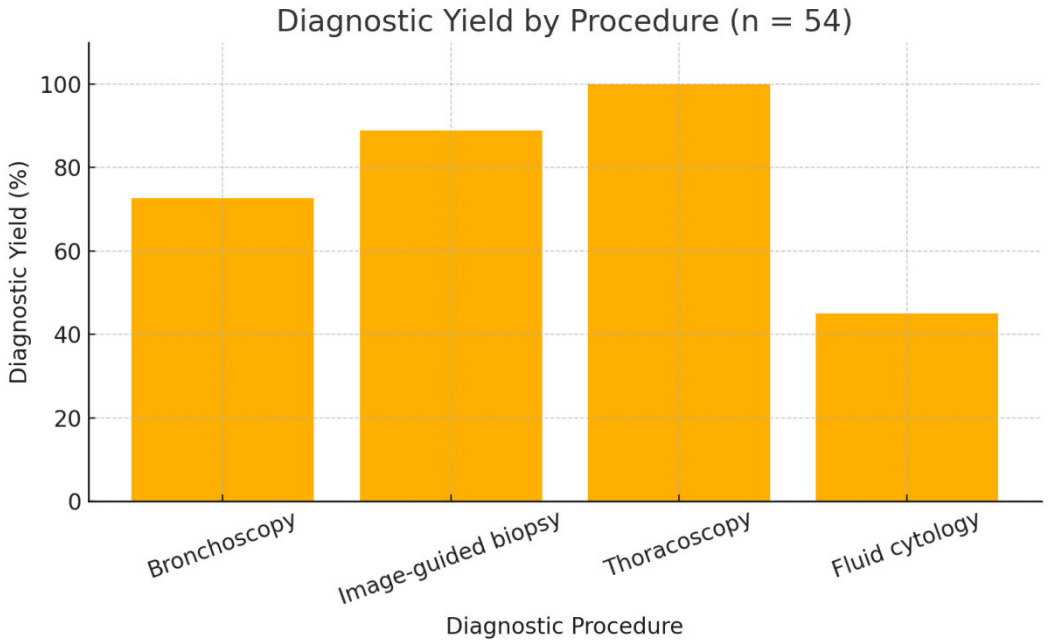
Table 2: Imaging Profile of the Study Population (n = 54)

Parameter	Category	n	%
Type of Lung Cancer	Primary	46	85.2
	Secondary (Metastatic)	8	14.8
Site of Lesion	Peripheral	33	61.1
	Central	21	38.9
Radiological Findings	Mass lesion	32	59.3
	Nodule	10	18.5
	Lung collapse	8	14.8
	Hilar prominence	6	11.1
	Pleural effusion	8	14.8
	Pleural nodules	8	14.8
	Cavitation	4	7.4

Diagnostic yield of procedures:

The diagnostic yield varied across procedures. Bronchoscopy with biopsy provided a definitive diagnosis in 16 of 22 patients (72.7%), while image-guided biopsy demonstrated a higher yield with 16 of 18 cases diagnosed (88.9%). Thoracoscopy-guided biopsy achieved the highest yield at 100% (6/6). In contrast, fluid cytology was less sensitive, yielding positive results in only 9 of 20 patients (45%). Overall, image-guided and thoracoscopic biopsies outperformed bronchoscopic and cytological techniques.

Figure 1: Diagnostic yield of Procedures:



Histopathology and Staging:

Among the 46 patients with primary lung cancer, adenocarcinoma was the predominant subtype, seen in 26 (56.5%), followed by squamous cell carcinoma in 14 (30.4%) and small cell carcinoma in 3 (6.5%). Adenosquamous carcinoma, undifferentiated carcinoma, and mesothelioma were each identified in 1 patient (2.2%). Among the 8 patients with secondary lung cancer, metastatic adenocarcinoma was most frequent (5; 62.5%), followed by metastatic squamous cell carcinoma, clear cell carcinoma, and malignant melanoma, each in 1 patient (12.5%). For non–small cell lung cancer (n = 39), most patients presented with advanced disease: Stage 4A in 12 (30.8%), Stage 4B in 10 (25.6%), Stage 3B in 8 (20.5%), and Stage 3A in 6 (15.4%), with only 2 (5.1%) in Stage 2A and 1 (2.6%) in Stage 2B. Among small cell lung cancer cases (n = 3), extensive-stage disease was seen in 2 (66.7%), while 1 (33.3%) had limited-stage disease at presentation.

Table 3: Histopathology and staging:

Parameter	Category	n	%
HPE – Primary Lung Cancer (n = 46)	Adenocarcinoma	26	56.5
	Squamous cell carcinoma	14	30.4
	Small cell carcinoma	3	6.5
	Adenosquamous carcinoma	1	2.2
	Undifferentiated carcinoma	1	2.2
	Mesothelioma	1	2.2
HPE – Secondary Lung Cancer (n = 8)	Metastatic adenocarcinoma	5	62.5
	Metastatic squamous cell carcinoma	1	12.5

	Clear cell carcinoma metastasis	1	12.5
	Metastatic malignant melanoma	1	12.5
NSCLC Stage (n = 39)	Stage 2A	2	5.1
	Stage 2B	1	2.6
	Stage 3A	6	15.4
	Stage 3B	8	20.5
	Stage 4A	12	30.8
	Stage 4B	10	25.6
SCLC Stage (n = 3)	Limited stage	1	33.3
	Extensive stage	2	66.7

Metastasis and Molecular Profile:
Metastatic involvement was most commonly observed in the contralateral lung (8; 14.8%) and pleura (8; 14.8%), followed by vertebrae (5; 9.3%), ribs (4; 7.4%), liver (3; 5.6%), and brain (2; 3.7%). Breast metastasis was rare (1; 1.9%). ALK status was available for 42 patients, with 3 (7.1%) positive and 39 (92.9%) negative; results were unavailable for 12 (22.2%). EGFR mutation testing was performed in 44 patients, of whom **18 (40.9%) were positive** and 26 (59.1%) were negative; 10 patients (18.5%) had unavailable results. PD-L1 expression was assessed in 41 patients, showing negative expression in 12 (29.3%), low in 8 (19.5%), intermediate in 14 (34.1%), and high in 7 (17.1%), while results were not available for 13 patients (24.1%).

Table 4: Metastatic Distribution and Molecular Profile of Study Participants (n = 54)

Parameter	Category	n	%
Metastasis Sites	Contralateral lung	8	14.8
	Pleura	8	14.8
	Vertebra	5	9.3
	Rib	4	7.4
	Liver	3	5.6
	Brain	2	3.7
	Breast	1	1.9
ALK Status (n = 42 available)	Positive	3	7.1
	Negative	39	92.9
	Not available	12	22.2
EGFR Status (n = 44 available)	Positive	18	40.9
	Negative	26	59.1
	Not available	10	18.5
PD-L1 Expression (n = 41 available)	Negative (0%)	12	29.3
	Low (<1%)	8	19.5
	Intermediate (1–49%)	14	34.1
	High (≥50%)	7	17.1
	Not available	13	24.1

Diagnostic Categorization of Lung Cancer Cases in the Study Cohort
Among the 46 patients with primary lung cancer, adenocarcinoma was the predominant subtype in both smokers and non-smokers, occurring in 14 of 26 smokers (53.8%) and 12 of 20 non-smokers (60%). Squamous cell carcinoma showed a strong association with smoking (11 smokers; 42.3% vs. 3 non-smokers; 15%), while small cell carcinoma occurred exclusively in smokers (3; 11.5%). Rare subtypes were infrequent and showed no clear association with smoking status. Clinically, adenocarcinoma cases most often presented with cough, dyspnea, and weight loss, whereas squamous cell carcinoma more frequently manifested with hemoptysis and chest pain. Small cell carcinoma exhibited aggressive behavior with systemic symptoms in all cases. EGFR mutations were significantly more common in females (12/16; 75%) than in males (6/38; 15.8%). ALK positivity was observed in 2 females (12.5%) and 1 male (2.6%), while ROS1 rearrangements were rare, detected in only one female patient.

DISCUSSION

The demographic characteristics of our cohort align closely with global and regional lung cancer data. The predominance of older adults, with more than 80% of patients above the age of 50, parallels findings from Sharma et al., who reported a similar age distribution among Indian lung cancer patients (mean age 60–70 years) [7]. The male predominance (70.4%) in our study also reflects national epidemiological patterns attributed to higher tobacco consumption among men, supported by Indian and international datasets [8].

Smoking remained the most significant exposure factor in our cohort, with 63% of patients identified as smokers and beedi smoking predominant. This is comparable to observations by Gajalakshmi et al., who demonstrated higher carcinogenic risk and mortality associated with beedi use compared to cigarette smoking [9]. Biomass exposure among non-smokers (40%) was notable and consistent with findings from Siddharthan et al., who described biomass fuel smoke as a major risk factor for lung cancer among women in low- and middle-income countries [10].

Clinically, cough, dyspnea, and weight loss were the most common presenting symptoms, mirroring the symptom profiles in large retrospective series from India and other Asian countries [11,12]. The tendency toward delayed presentation, with nearly 60% seeking medical evaluation after 1–6 months of symptoms, is similar to observations by Youlden et al., who attributed diagnostic delays to non-specific early symptoms and lack of screening strategies [13].

Radiologically, the predominance of peripheral mass lesions in our study is in agreement with global trends demonstrating a shift from central squamous cell cancers to peripheral adenocarcinomas, likely due to changes in smoking patterns and environmental carcinogens [14]. Additional findings such as collapse, nodules, and effusions were comparable to imaging spectra reported in other observational studies from Asia and Europe [15].

Diagnostic yield varied across procedures, with image-guided biopsy (88.9%) and thoracoscopy (100%) outperforming bronchoscopy (72.7%). This aligns with results reported by Heerink et al., who found higher sensitivity of CT-guided biopsy for peripheral lesions, and by Metintas et al., who demonstrated superior diagnostic accuracy of medical thoracoscopy for pleural pathology [16,17]. Bronchoscopy remains essential for centrally located lesions, yet its lower yield for peripheral tumors has been widely recognized [18].

Histopathologically, adenocarcinoma was the predominant subtype (56.5%), consistent with the established epidemiological transition described by Travis et al., who noted a marked rise in adenocarcinoma worldwide [19]. The significant association between smoking and squamous cell carcinoma in our cohort aligns with well-established causative relationships reported in Western and Asian populations [20]. The overwhelming majority of NSCLC cases presenting in advanced stages (III–IV) is also comparable with Indian and global studies, highlighting persistent challenges in early detection [21].

Metastatic patterns observed in our study—predominantly involving contralateral lung, pleura, bone, and brain—are compatible with classical metastatic pathways described by Quint and Osman [22]. The higher prevalence of EGFR mutations (40.9%), particularly among females, reflects mutation rates reported in Asian populations, which are considerably higher than those in Western cohorts [23]. ALK and ROS1 positivity rates were low, consistent with global mutation frequencies reported by Mok et al. [24]. PD-L1 distribution in our cohort closely resembles values reported in multicenter Asian and European datasets, reinforcing its biological variability and importance in therapeutic stratification [25].

Our study also highlights important clinicopathological correlations. Adenocarcinoma was the predominant subtype in both smokers and non-smokers, consistent with trends noted in other Indian and Asian studies, whereas squamous cell carcinoma was strongly linked to smoking, similar to findings by Islami et al. [26]. The aggressive clinical presentation of small cell lung cancer observed in our cohort mirrors classical descriptions of rapid progression and systemic involvement [27].

Overall, our findings are broadly consistent with the existing literature, while highlighting contextual elements such as high beedi use, biomass exposure, and late-stage diagnosis. These patterns underscore the need for targeted public health interventions, improved access to diagnostic technologies, and routine incorporation of molecular profiling to enable personalized therapy in lung cancer.

CONCLUSION

Lung cancer in our cohort was predominantly diagnosed in older adults, with strong links to smoking and biomass exposure. Adenocarcinoma was the most common subtype, and most patients presented at advanced stages. Image-guided and thoracoscopic biopsies offered the highest diagnostic yield, and EGFR mutations were frequent, supporting the need for routine molecular testing. These findings underscore the importance of early detection, risk-factor control, and precision-based management. Strengthening community awareness and improving access to diagnostic facilities may help reduce delayed presentations. Future studies with larger cohorts are warranted to validate these findings and guide regional lung cancer strategies.

REFERENCES

1. Sung H, Ferlay J, Siegel RL, et al. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality. *CA Cancer J Clin*. 2021;71(3):209-249.
2. Islami F, Torre LA, Jemal A. Global trends of lung cancer mortality and smoking prevalence. *Transl Lung Cancer Res*. 2015;4(4):327-338.
3. Sun S, Schiller JH, Gazdar AF. Lung cancer in never smokers. *Nat Rev Cancer*. 2007;7(10):778-790.
4. Noronha V, Pinninti R, Patil VM, et al. Lung cancer in India: Epidemiology and clinical outcomes. *J Glob Oncol*. 2016;2(3):207-215.
5. Ou SHI. Epidermal growth factor receptor mutation status and histological subtype shift in lung cancer. *J Thorac Oncol*. 2012;7(2):343-347.
6. Dela Cruz CS, Tanoue LT, Matthay RA. Lung cancer: Epidemiology, risk factors, and biology. *Chest*. 2011;139(4):752-768.
7. Sharma A, et al. Clinical profile of lung cancer in India: a retrospective analysis. Lung India. 2019;36(4):310–6.
8. Thun MJ, Carter BD, et al. 50-year trends in smoking-related mortality. N Engl J Med. 2013;368:351–64.
9. Gajalakshmi V, Peto R, et al. Smoking and mortality from diseases in India. Lancet. 2003;362:507–15.
10. Siddharthan T, Grigsby MR, et al. Household air pollution and lung cancer risk. Lancet Glob Health. 2018;6:e643–e653.
11. Saha A, et al. Clinical spectrum of lung cancer: an Indian experience. J Cancer Res Ther. 2019;15:857–62.

12. Yu X, et al. Presenting symptoms of lung cancer in Asian populations. Thorac Cancer. 2020;11:1234–41.
13. Youlden DR, Cramb SM, Baade PD. The international epidemiology of lung cancer. J Thorac Oncol. 2008;3:819–31.
14. Travis WD. Lung cancer: pathology perspectives. Clin Chest Med. 2020;41:67–75.
15. Ahn J, et al. Radiological patterns of lung cancer: a multicenter study. Eur Respir J. 2018;52:180150.
16. Heerink WJ, de Bock GH, et al. Complication rates of CT-guided lung biopsy: meta-analysis. Eur Radiol. 2017;27:138–48.
17. Metintas M, et al. Medical thoracoscopy vs. CT-guided biopsy. Chest. 2010;137:1362–8.
18. Rivera MP, Mehta AC. Diagnosis of lung cancer: ACCP guidelines. Chest. 2013;143:e142S–e165S.
19. Inamura K. Lung cancer: epidemiology and genetics. Int J Clin Oncol. 2018;23:356–65.
20. Islami F, Torre LA, Jemal A. Global lung cancer trends. Ann Oncol. 2015;26:161–70.
21. Balasubramanian V, et al. Stage distribution of lung cancer in India. Indian J Cancer. 2019;56:45–52.
22. Quint LE, Osman M. Imaging of metastatic lung cancer. Cancer. 2003;98:1608–11.
23. Zhang YL, Yuan JQ, et al. EGFR mutation prevalence in Asian lung cancer patients. PLoS One. 2016;11:e0154201.
24. Mok TS, Wu YL, et al. EGFR and ALK targeted therapies in lung cancer. Nat Rev Clin Oncol. 2015;12:473–90.
25. Rittmeyer A, et al. PD-L1 expression in lung cancer: global patterns. Lancet. 2017;389:255–65.
26. Islami F, et al. Tobacco smoking and histological types of lung cancer. Int J Cancer. 2020;146:2668–76.
27. Farago AF, Keane FK. Biology and therapy of small-cell lung cancer. Mayo Clin Proc. 2018;93:1588–600.