

P1.309. Causes and Patterns of Mortality After Surgery in Patients with Non–Small Cell Lung Cancer: A Retrospective Study

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INTRODUCTION

Lung cancer is a major public health issue with almost 2.5 million new cases and over 1.8 million deaths worldwide [1]. In Spain, it is the third most frequently diagnosed cancer, with 34,908 new cases expected in 2026 [2].

Non-small cell lung cancer (NSCLC) accounts for 80-85% of all lung cancer cases. Complete surgical resection (R0) is considered the standard of care for resectable NSCLC. However, mortality remains high, and older patients may die from competing conditions. Moreover, 88% of patients have comorbidities, which may contribute to competing risk of death, especially in older patients [3].

This study aims to describe and analyze the causes and types of death following R0 resection in NSCLC.

METHODS

This is a retrospective study including patients from the prospective Thoracic Tumor Registry (TTR, NCT02941458). In total, 31,095 patients diagnosed with NSCLC were initially identified. For this analysis, patients with stage I-IIIa NSCLC who underwent R0 without neoadjuvant therapy were included (Figure 1). Demographic and clinical characteristics were retrieved from the registry, including sociodemographic, epidemiological, clinical, and treatment outcomes (i.e., date of death).

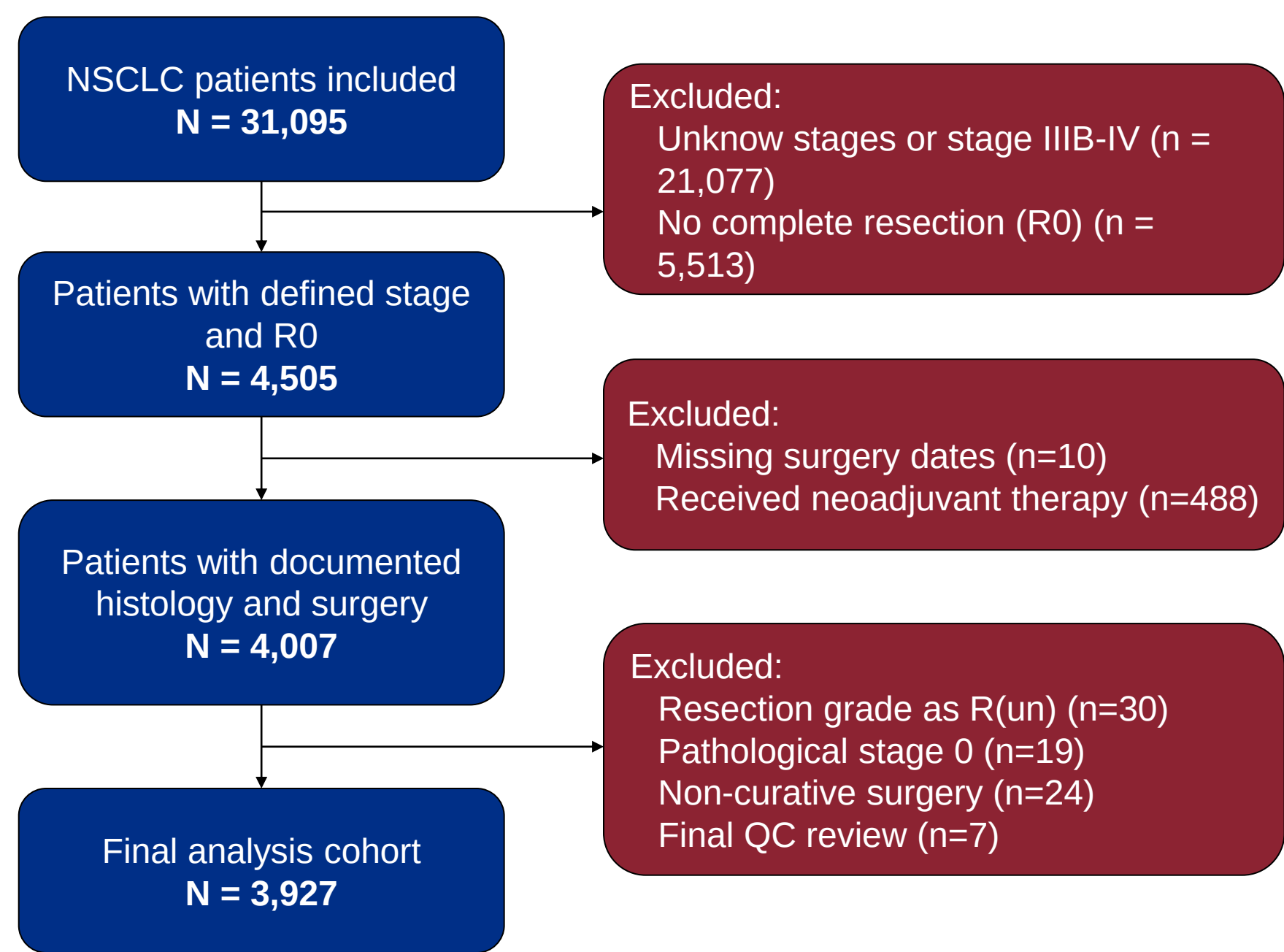


Figure 1. Flow diagram of patient selection process.

Abbreviations: NSCLC: non-small cell lung cancer, QC: quality control, R0: complete resection, R(un): uncertain resection.

RESULTS

A total of 3,927 patients were included in the final analysis. Demographic and clinical characteristics are described in Table 1. The median follow-up was 54.2 months (P25–P75: 22.9–93.8) during which 1,353 (34.4%) patients died. Lung cancer was the leading cause of death while non-lung cancer causes of death included unknown, infections, second primary cancers (SPCs), other causes and cardiovascular disease (Figure 2), with similar distribution over time.

Table 1. Baseline characteristics in the study cohort.

	Total (N = 3,927)	Initial stage	Total (N = 3,927)
Sex			
Male	2,803 (71.4%)	I	1,941 (49.4%)
Female	1,122 (28.6%)	IA	1,091 (27.8%)
Median age [P₂₅, P₇₅]	67 [60-72]	IB	849 (21.6%)
Smoking habit		II	1,217 (31.0%)
Non-smoker	475 (12.1%)	IIA	454 (11.6%)
Former smoker	2,092 (53.3%)	IIB	763 (19.4%)
Smoker	1,306 (33.3%)	III	769 (19.6%)
Unknown	54 (1.4%)	IIIA	769 (19.6%)
ECOG at diagnosis		T Stage	
0	2,340 (59.6%)	T1	1,382 (35.2%)
1	1,439 (36.6%)	T2	1,663 (42.3%)
2	128 (3.3%)	T3	620 (15.8%)
> 2	15 (0.4%)	T4	200 (5.1%)
Unknown	5 (0.1%)	Tis	3 (0.1%)
Histology		Tx	45 (1.1%)
Adenocarcinoma	2,501 (63.7%)	Unknown	14 (0.4%)
Squamous	1,127 (28.7%)	N Stage	
Adenosquamous	76 (1.9%)	N0	2,749 (70.0%)
LCNC	72 (1.8%)	N1	670 (17.1%)
Large Cell Carcinoma	69 (1.8%)	N2	409 (10.4%)
Sarcomatoid	23 (0.6%)	Nx	84 (2.1%)
NOS/Undifferentiated	24 (0.6%)	Unknown	15 (0.4%)
Others	23 (0.6%)		
Unknown	12 (0.3%)		

Abbreviations: ECOG: Eastern Cooperative Oncology Group; LCNC: Large Cell Neuroendocrine Carcinoma; NOS: Not Otherwise Specified

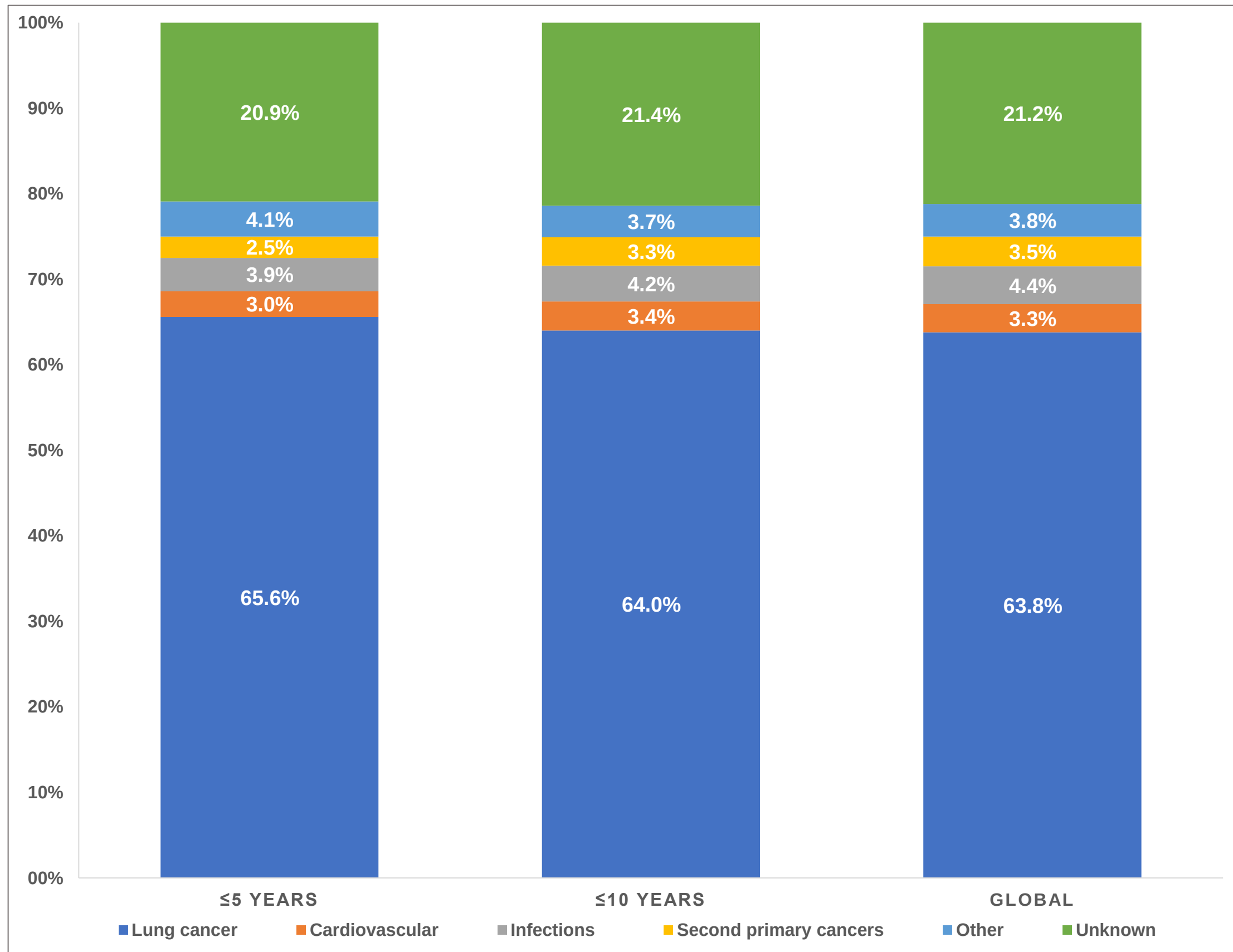


Figure 2. Distribution of causes of death in the study cohort by follow-up period.

Patterns of disease varied substantially according to cause of death (Figures 3-4). Late progression (>24 months) was more frequently observed among patients who died from SPCs or infections, whereas early progression (≤6 months) was more common among those who died from cardiovascular disease or other causes. The median time from first progression to death was longest among patients who died from SPCs (31.8 months) and shortest among those who died from cardiovascular and other causes (7.3 and 7.2 months, respectively) Patients who died from lung cancer more frequently experienced ≥3 progressions prior to death with a median interval of 11.8 months. Non-lung cancer deaths were generally preceded by fewer progression events, most commonly a single progression.

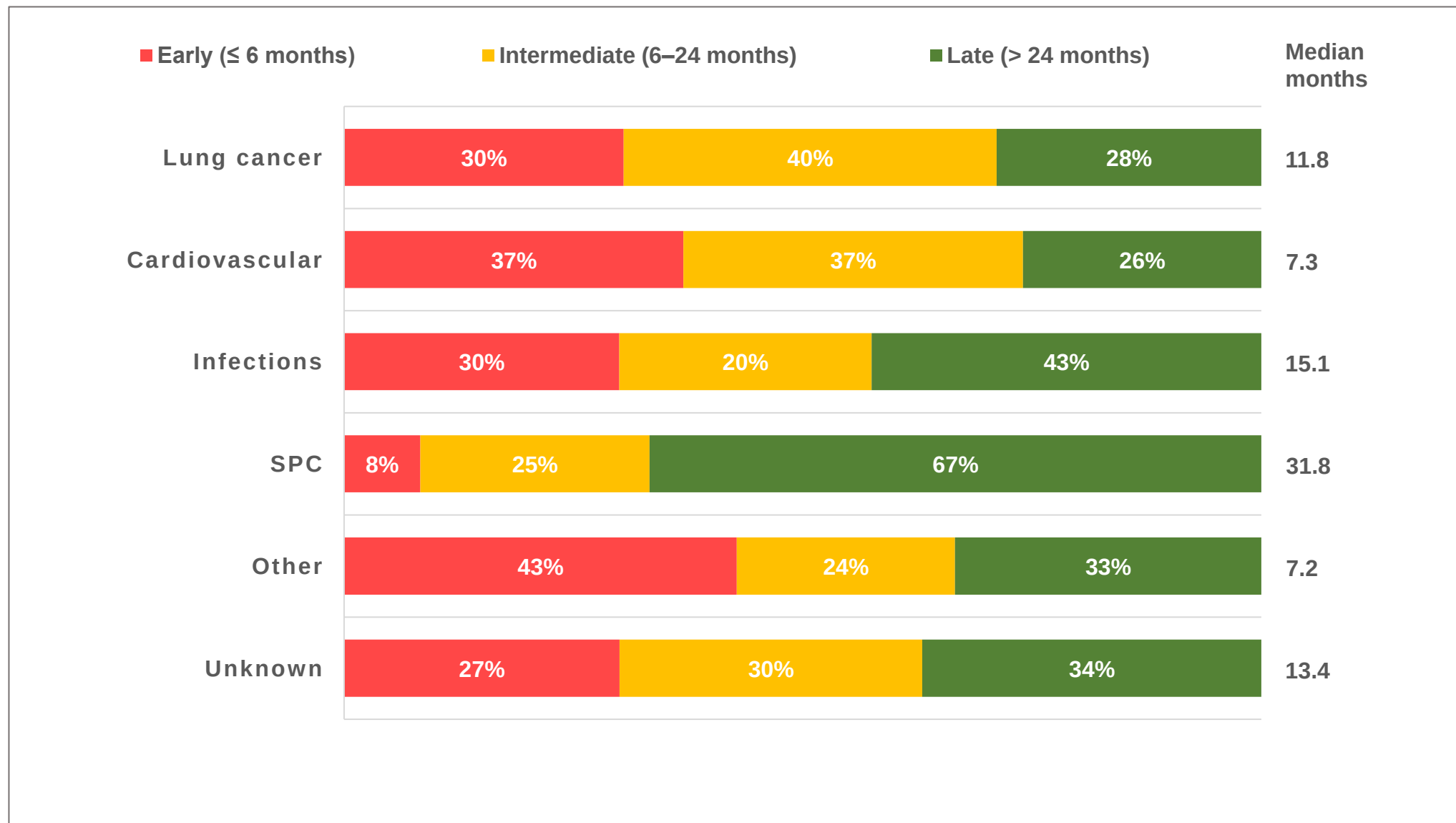


Figure 3. Time from first documented progression to death by cause of death. The right panel shows median time (months) from first progression to death.

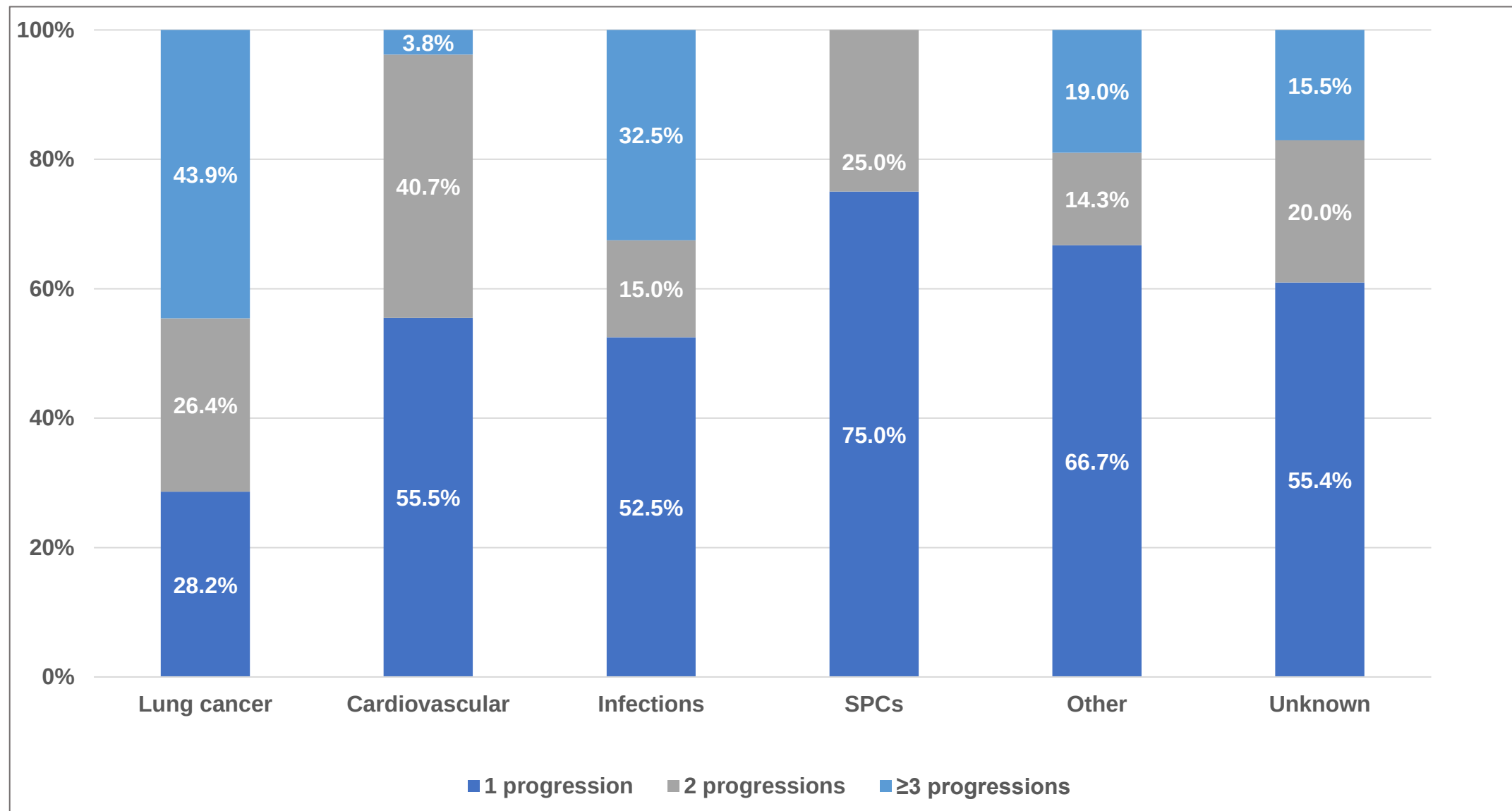


Figure 4. Number of disease progression events according to cause of death. Stacked bars represent the proportion (%) of patients experiencing 1, 2, or ≥3 progression events before death.

DISCUSSION AND CONCLUSION

This study provides a general overview of mortality patterns using real-world data from the Spanish TTR. **Lung cancer remained the main cause of death** in patients with stage I-IIIa NSCLC after complete resection. However, a significant proportion of deaths were due to non-lung cancer causes. The time from first documented progression to death and the temporal patterns of progression vary substantially according to cause of death, suggesting heterogeneous clinical trajectories after recurrence.

Overall, these findings highlight **distinct pathways to death after R0 resection** in NSCLC, reflecting differences in disease behavior and patient characteristics. These results support the need for individualized post-operative surveillance and survivorship strategies.

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