

Comprehensive implementation of molecular testing and targeted therapies in advanced stage IV NSCLC and survival – a retrospective population-based study

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BACKGROUND

Especially in advanced disease of patients with non-small cell lung cancer (NSCLC), personalized medicine has transformed the standard of care. The nNGM Lung Cancer (Nationales Netzwerk Genomische Medizin Lungenkrebs) offers access to molecular testing and personalized therapy to all patients with NSCLC in Germany. However, little is known about the widespread implementation outside certified cancer centers in Germany. Therefore, this study analyses the extent of molecular testing and application of immune checkpoint inhibitors (ICI) and targeted therapies (TT) as well as the impact on survival in a real-world patient cohort.

METHODS

Data of adults (≥ 18 years) with lung cancer (ICD-10 C34) diagnosed between 2015 to 2022 were extracted from the database of the Hessian Cancer Registry. For further analysis cases of NSCLC according the WHO classification [1] with available clinical information and stage IV (TNM edition 8th) were selected (Figure 1). Information of molecular testing and underlying detected aberrations were retrieved from available digital histopathological reports and analyzed per health care provider (in- and outpatient clinics, medical practices). Health care providers were stratified according numbers of treated patients in years the 2021/2022. Descriptive statistics were performed. For outcome analyses pooled data from German population-based cancer registries were retrieved from the Robert Koch-Institute. Cancer registries with complete coverage between 2004 and 2022 were included for relative overall survival estimates (OS) using the period analysis method to compare the periods 2019-2022 versus 2013-2016 [2]. Weights according to the International Cancer Survival Standard (ICSS) 1 were used for age standardization [3].

CONCLUSION

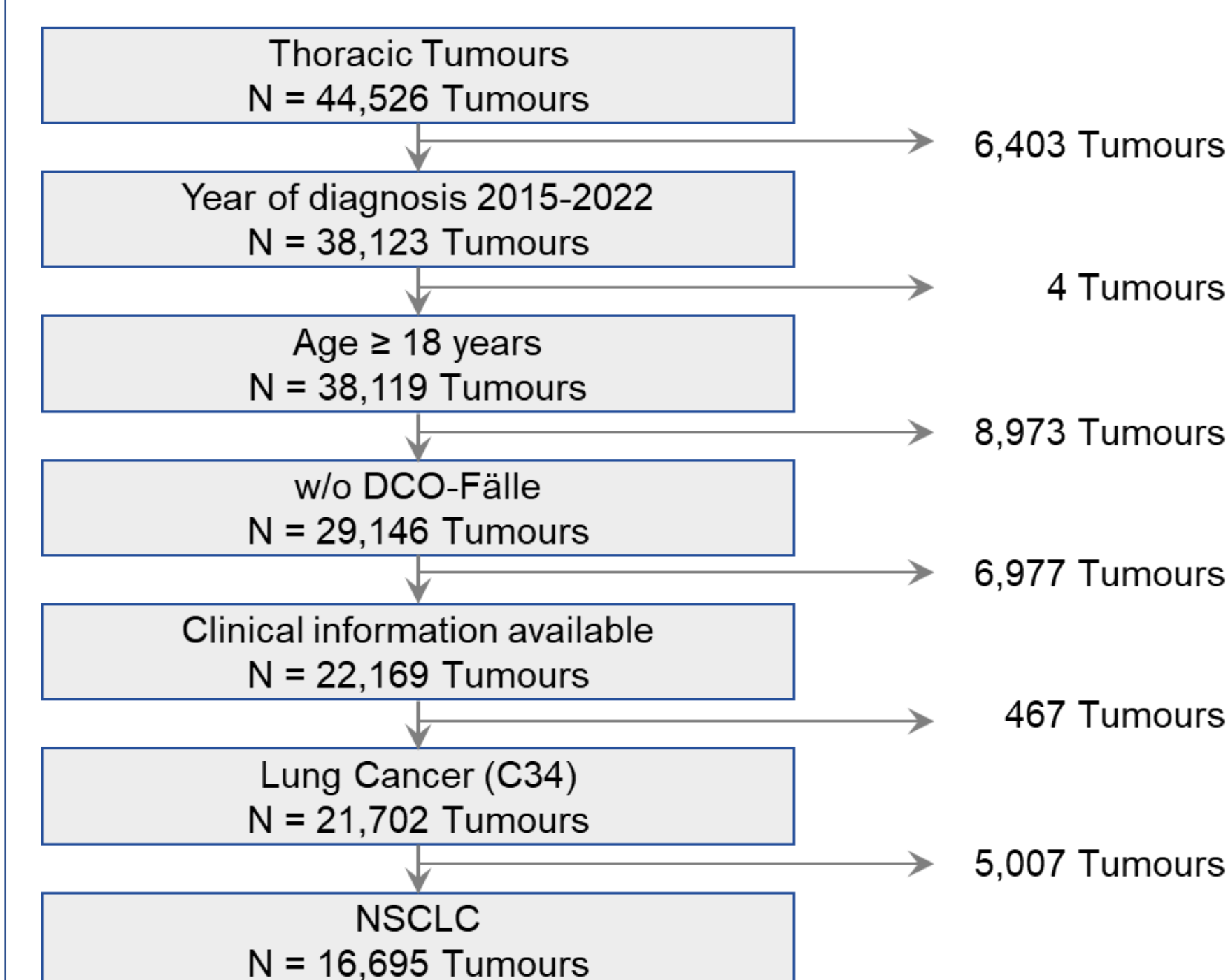
Despite recent recommendations for standard of care in advanced disease NSCLC, molecular testing has been performed in just 68% of cases, and platinum-based chemotherapy without ICI or TT has been still administered in 16% of patients. Access to novel diagnostic and therapeutic modalities may be a reason, while differences could be detected among health care providers. However, after approval of ICI in 2015 and implementation of molecular testing, relative 5-year survival improved overall in all patients by 6%. Younger patients aged 15-44 years and surprisingly also patients in stage III benefited most by 16% and 11% over time, respectively, most likely due to increased availability of sequential therapeutic options during disease courses.

REFERENCES

1. Thoracic Tumours, WHO Classification for Tumours, 5th edition, 2021; 2. Holleczerk B et al (2009) . Methods Inf Med 48(2):123–128; 3. Corazzair I et al. (2004) Eur J Cancer40(15):2307-16

RESULTS

Figure 1 Data source Hessian Cancer Registry



Thoracic tumours= ICD-10 C33/34, C38.4, C45.0; w/o DCO=without death certificate only, clinical information=tumour characteristics, therapy, outcome

After selection of specific histologies of NSCLC in lung cancer cases 16,695 patients with year of diagnosis between 2015 and 2022 were available for further analysis, of which 51% were diagnosed at stage IV.

Figure 4 Firstline treatment of patients with stage IV NSCLC from 2015 to 2022

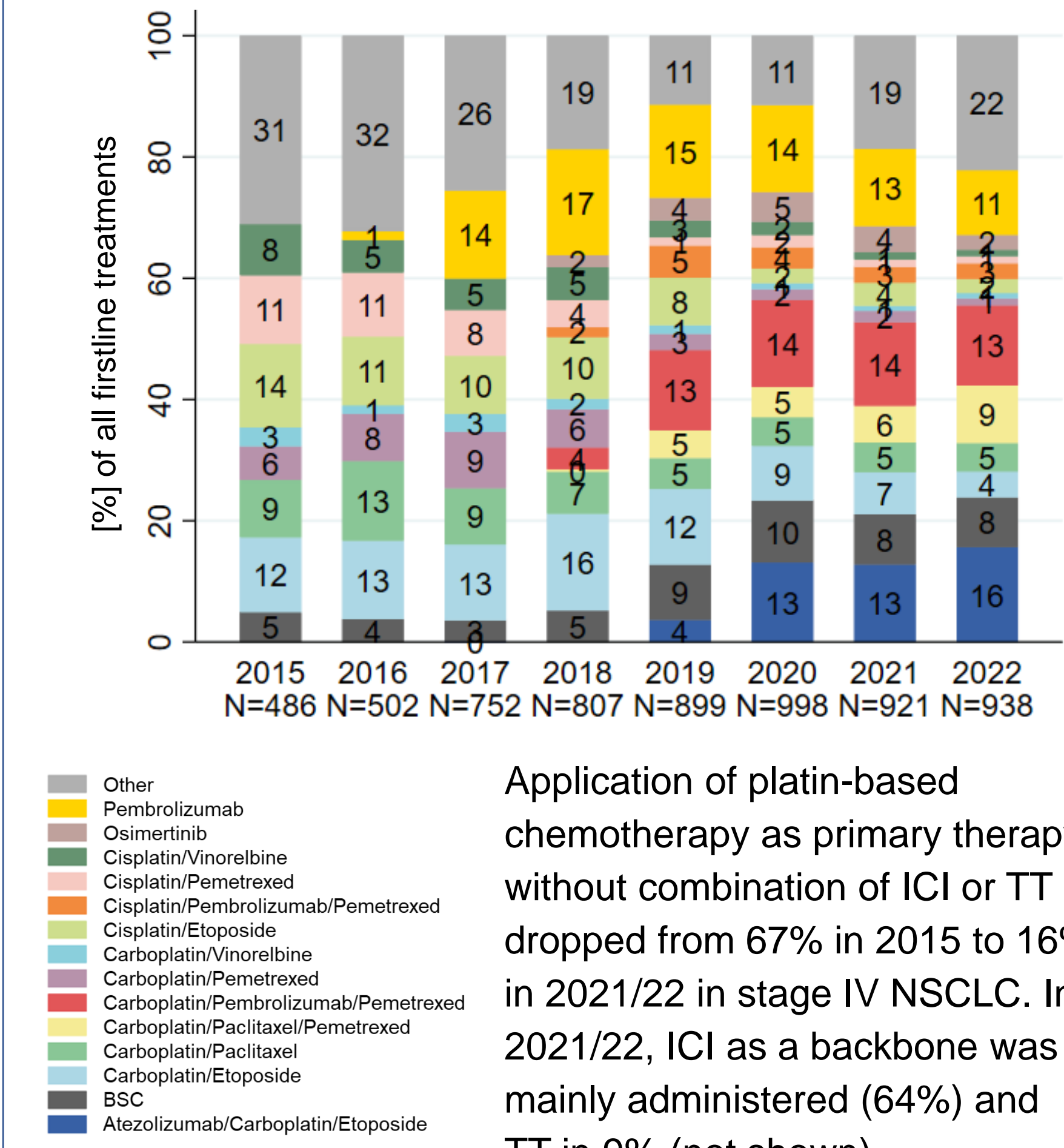
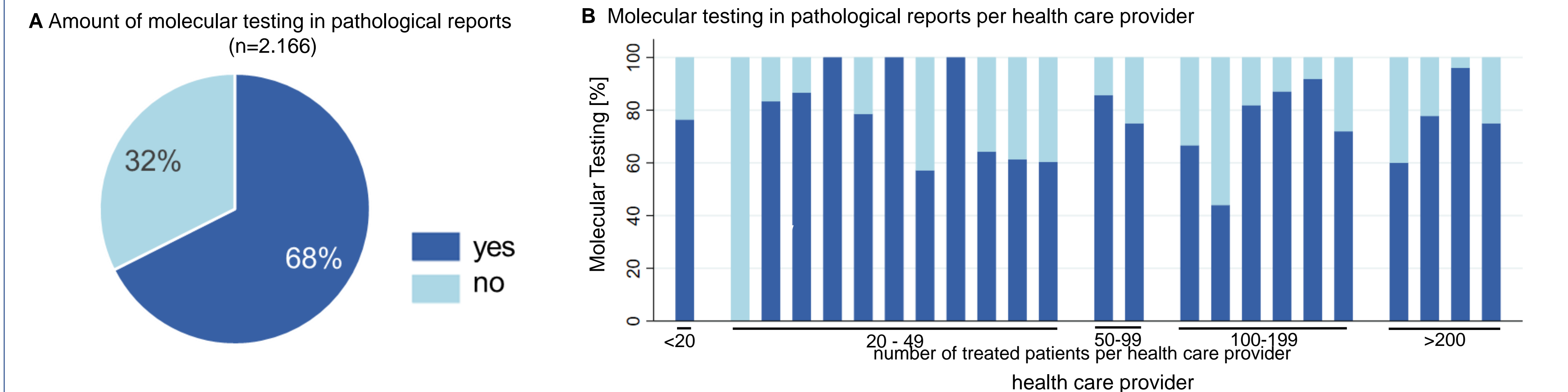


Figure 2 Molecular testing in pathological reports in stage IV NSCLC



Molecular testing in pathological reports for patients with NSCLC stage IV in years of diagnosis 2021/22 has been detected in 68% (Figure 2A). Amount of molecular testing highly varied between health care providers (one bar per health care provider) from 0-100% regardless of the number of treated patients (n<20, n=20-49, n=50-99, n=100-199, n>200) (Figure 2B).

Figure 3 Detected alterations in molecular pathological reports in stage IV NSCLC

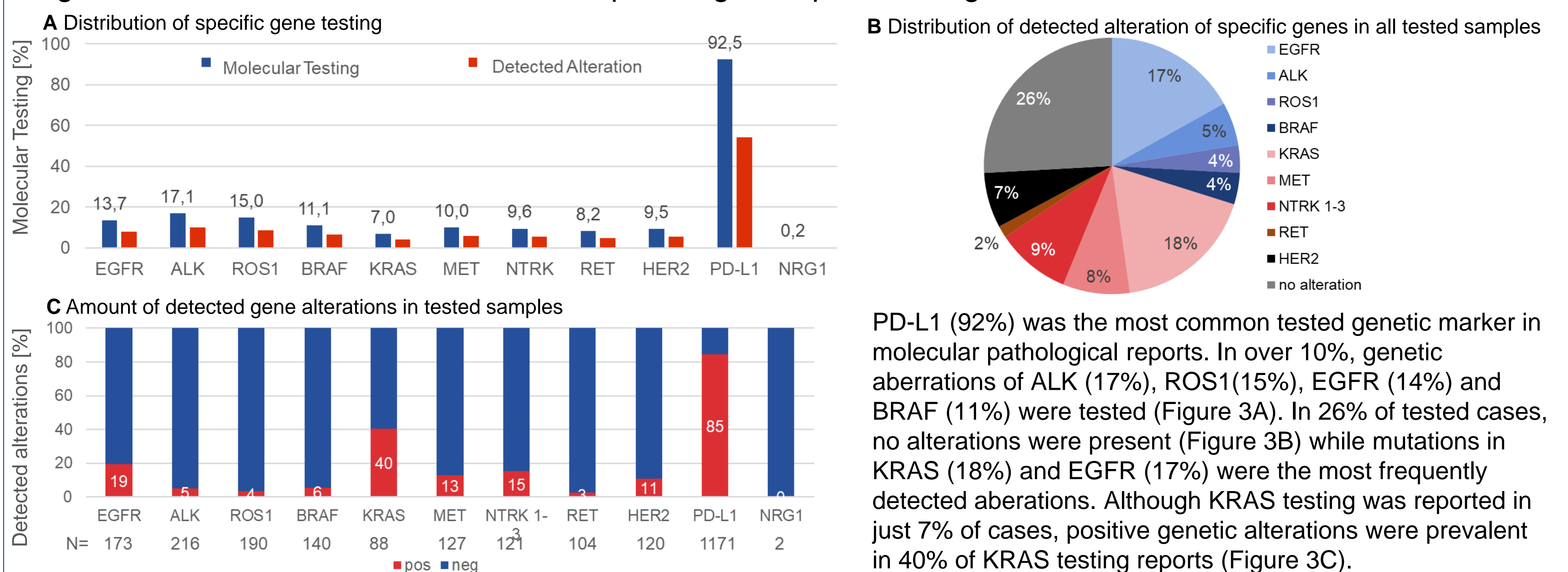


Figure 5 Period analysis of relative survival of patients with NSCLC

