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INTRODUCTION

- Lung cancer screening programs identify early-stage malignancies amenable to curative-intent treatment.
- The molecular landscape of asymptomatic, screening-detected tumors remains incompletely characterized.
- Broad molecular profiling may identify biomarkers relevant to perioperative therapy and clinical trials.

OBJECTIVE

To determine the prevalence of Tier 1 actionable genomic alterations and PD-L1 expression in lung cancers resected after detection through the first two years of the British Columbia Lung Cancer Screening Program.

METHODS

Study Design

- Retrospective cohort; May 2022-Dec 2024; four provincial health authorities.
- Screening eligibility: age 55-74 years and PLCom2012 risk prediction in 6 years $\geq 1.51\%$. Positive screens were category 4 or 5.

Molecular Testing

- Targeted DNA/RNA next-generation sequencing of FFPE tissue. Alterations classified using AMP/ASCO/CAP criteria.
- PD-L1 assessed by 22C3 immunohistochemistry; positivity defined as TPS $\geq 1\%$.

Analysis: descriptive statistics and exact 95% confidence intervals (SPSS v30).

SCREENING AND TREATMENT FLOW

10,730 LDCT scans

342 positive screens (3.2%)

104 surgical referrals

86

resection

16

SABR

2

surveillance

38/86 resected tumors underwent genomic profiling (44%).

DISCUSSION AND CONCLUSION

SCREEN-DETECTED LUNG CANCER show a genetic alteration profile similar to that of smoking-associated lung cancer.

Approximately 1 in 5 profiled tumors carried a Tier 1 actionable alteration, and nearly 1 in 2 expressed PD-L1.

Clinical Interpretation

- Drivers included KRAS G12C, MET exon 14 skipping, ROS1 fusion, and EGFR G719S.
- The spectrum supports combined DNA/RNA profiling even in small, early-stage lesions.

Limitations

Small retrospective cohort, profiling performed in 44% of resections, and potential testing-selection bias.

Future Direction

Prospective systematic testing with linkage to treatment eligibility, recurrence, and survival outcomes.

REFERENCES & ACKNOWLEDGEMENTS

References



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AI use disclosure

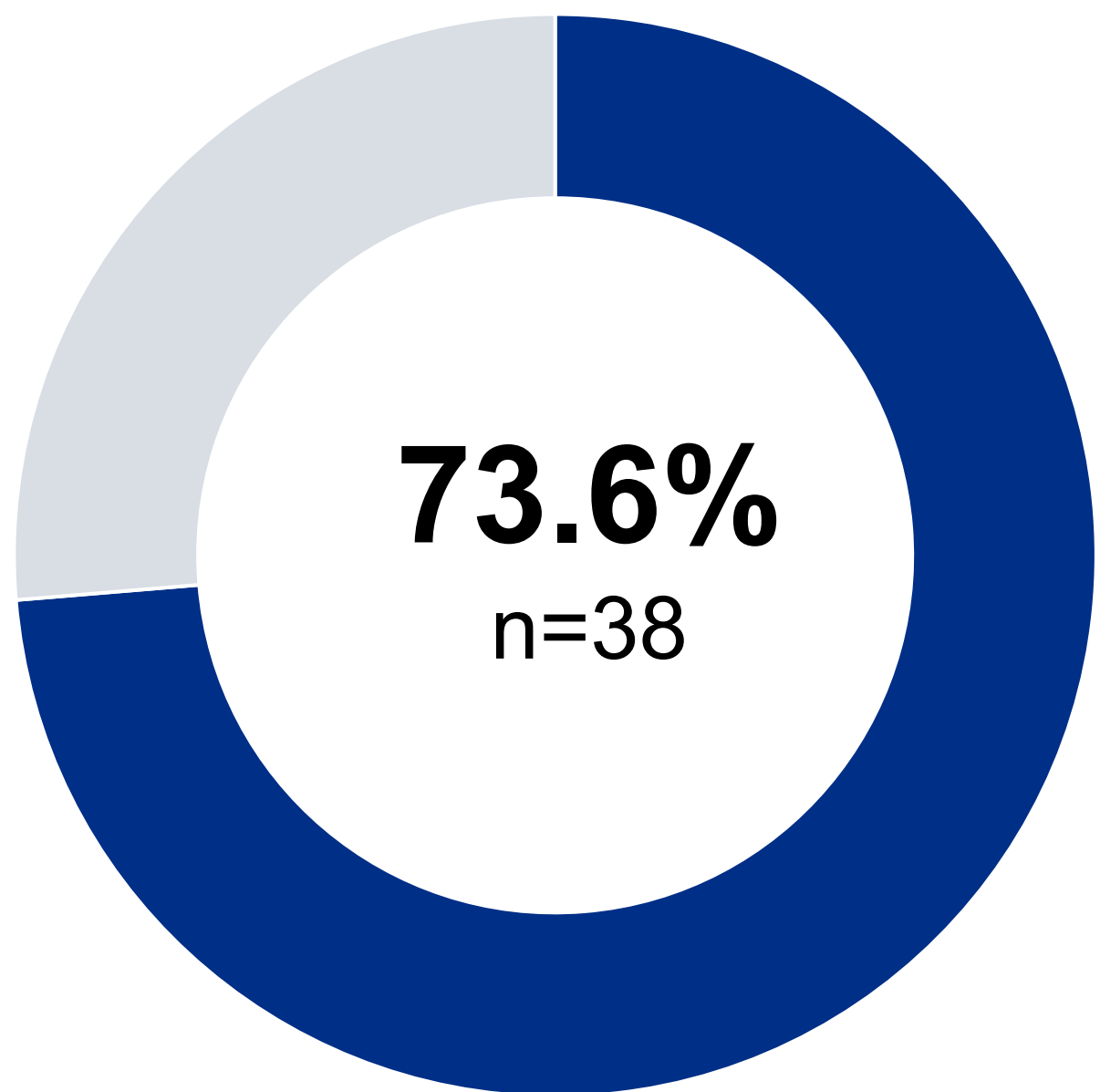
OpenAI ChatGPT was used to assist with language review and formatting. Scientific interpretation and final content were reviewed by the authors.

RESULTS

PROFILED COHORT (n=38)

Mean age	66.8 $\pm$ 5.1 years
Female	21 (55.0%)
Former smokers	23 (60.5%)
Mean tumor size	21.2 $\pm$ 8.8 mm
Adenocarcinoma	32 (84.2%)
Node-negative CT	35 (92.1%)

Pathologic Stage



■ Stage I n=28 (73.6%)
■ Stage II n=10 (26.4%)

Early-Stage Distribution

All profiled tumors were stage I-II;
28/38 were stage I.

38

Profiled tumors

44% of 86 resections

18.4%

Tier 1 actionable

7/38; 95% CI 7.7-34.3

47.4%

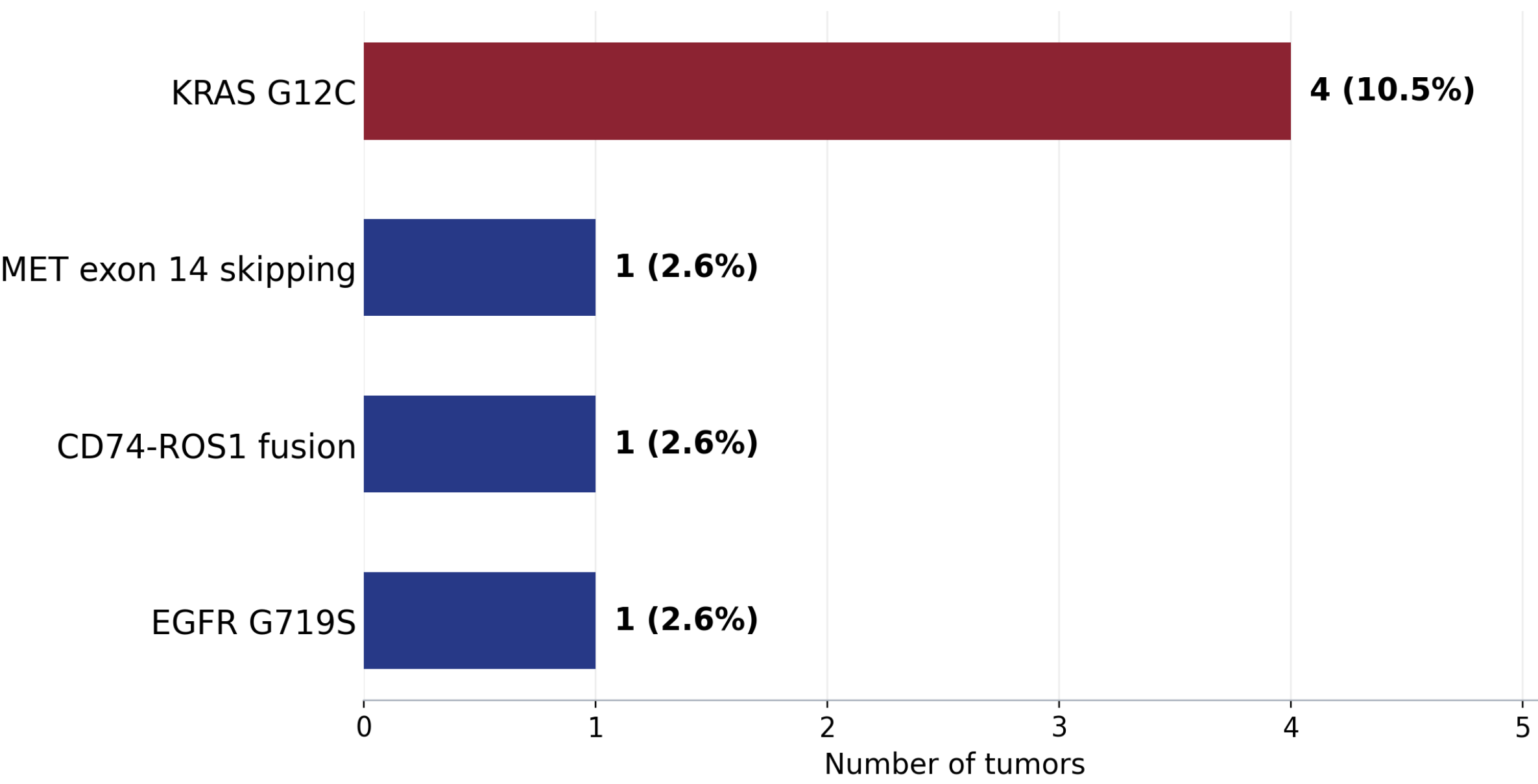
PD-L1 TPS $\geq 1\%$

18/38; 95% CI 31.0-64.2

Predominantly
Adenocarcinoma

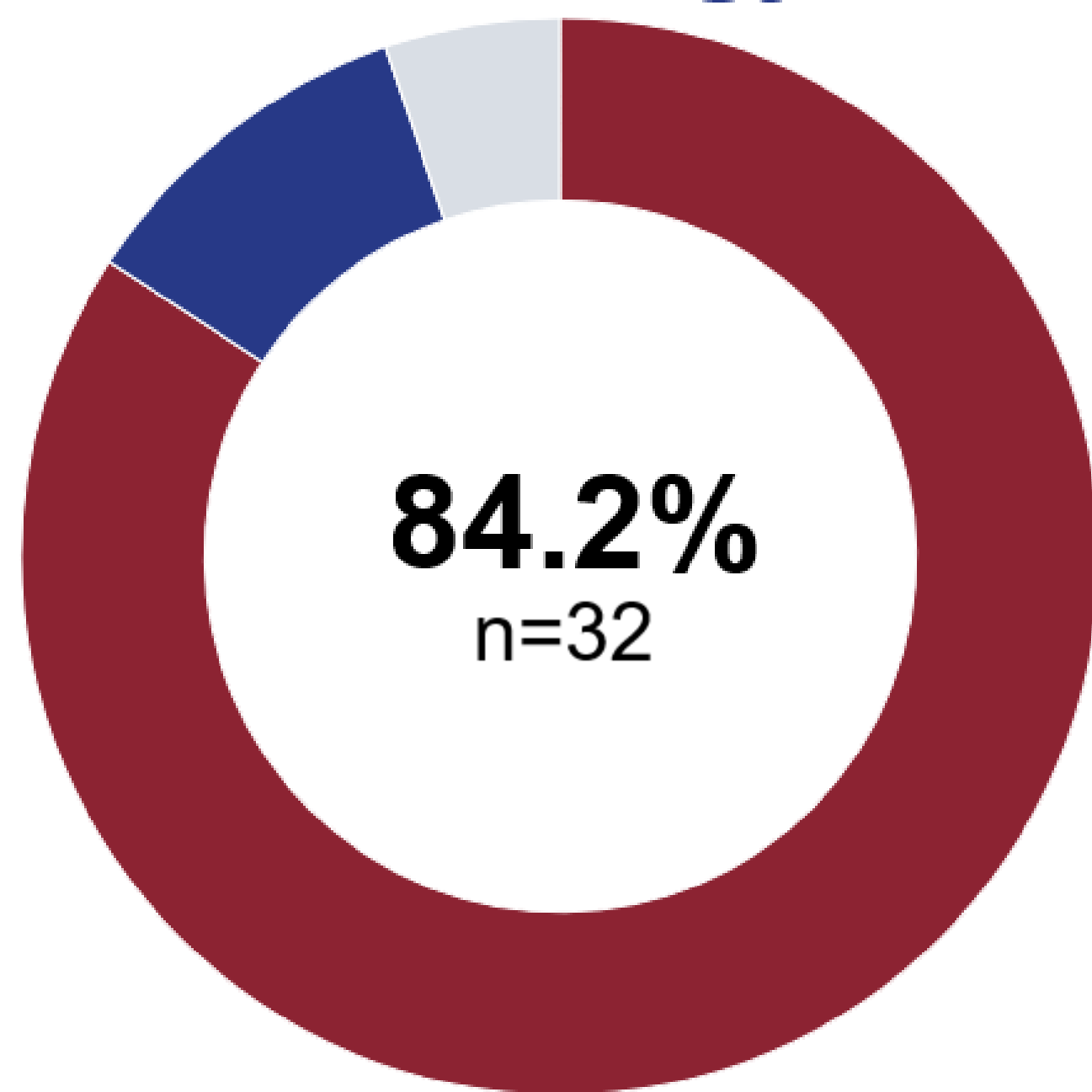
32/38 profiled tumors were
adenocarcinomas.

TIER 1 ACTIONABLE ALTERATIONS



KRAS G12C accounted for 4 of 7 actionable findings.

Histology



■ Adenocarcinoma n=32 (84.2%)
■ Squamous n=4 (10.5%)
■ Other n=2 (5.3%)