



# Clinical, Pathological, and Molecular Distinctions Between Solitary and Multiple Lung Nodules: A Prospective Registry Analysis

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IASLC 2026 World  
Conference on Lung Cancer  
SEPTEMBER 12 - 15, 2026  
SEOUL, REPUBLIC OF KOREA

## INTRODUCTION

- Lung cancer frequently presenting as indeterminate lung nodules on imaging.
- The clinical and biological characteristics of solitary versus multiple lung nodules remain incompletely understood.
- This study aimed to compare the clinical, pathological and molecular characteristics of solitary versus multiple lung nodules that are resected.

## METHODS

Data from a local prospective collection of consecutive patients enrolled in a lung nodule registry at a tertiary hospital in Hong Kong. The study cohort comprised patients who underwent surgical resection between January 2022 and February 2025. Clinical demographics, radiological characteristics, surgical approaches, and histopathological and molecular findings were systematically evaluated and compared between patients presenting with solitary lung nodule versus multiple lung nodules.

## RESULTS

Total patients: **136**  
Solitary Nodules: **34 (25%)**  
Multiple Nodules : **102 (75%)**  
Mean Pack-Years: **4.9 vs 16.6**  
(Solitary vs Multiple, P=0.018)

## DISCUSSION AND CONCLUSION

- Solitary and multiple lung nodules represent distinct clinical and biological entities. Solitary nodules are associated with a higher incidence of solid morphology, KRAS mutations, and more advanced disease stages at diagnosis, occurring more frequently in males and smokers.
- These divergent profiles underscore the necessity for tailored diagnostic and therapeutic strategies and highlight the need for further investigation into the distinct molecular pathogenesis driving solitary versus multiple lung nodules.

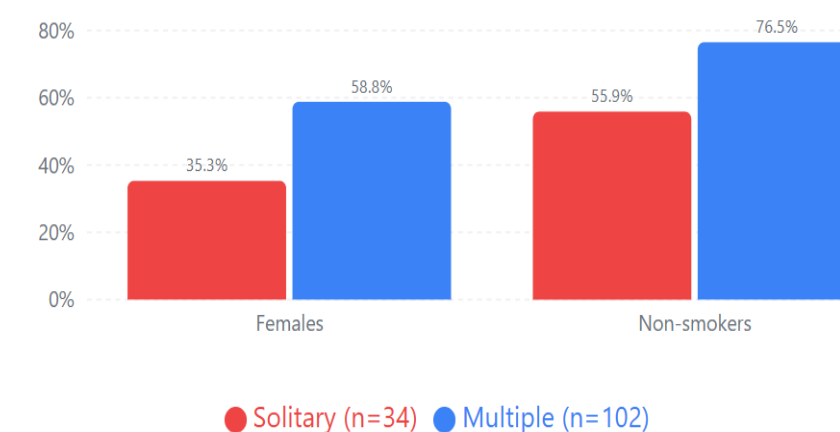
## ACKNOWLEDGEMENTS

This research was supported by Clinical Research Fellowship Scheme, the University of Hong Kong.

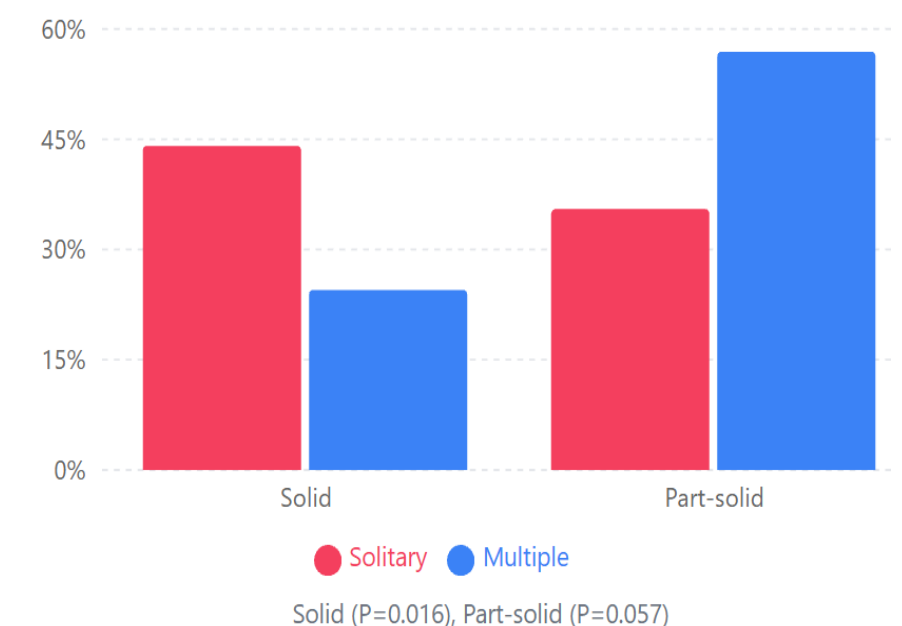
## RESULTS

Compared to patients with solitary nodules, those with multiple nodules were more frequently females (58.8% vs 35.3%, P=0.017) and non-smokers (76.5% vs. 55.9%, P=0.022), with significantly lower cumulative smoking exposure ( $4.9 \pm 12.8$  vs.  $16.6 \pm 28.8$  pack-years, P=0.018). Solitary nodules were more likely solid (44.1% vs. 24.5%, P=0.016) with a trend toward fewer part-solid morphologies (35.5% vs. 56.9%, P=0.057). The solitary group underwent more wedge resections (25.0% vs. 11.8%, P=0.042), presented with more advanced disease (Stage II: 17.6% vs. 2.0%, P=0.001; Stage I: 64.7% vs. 88.2%, P=0.002), and a higher frequency of KRAS mutations (50.0% vs. 15.0%, P=0.047).

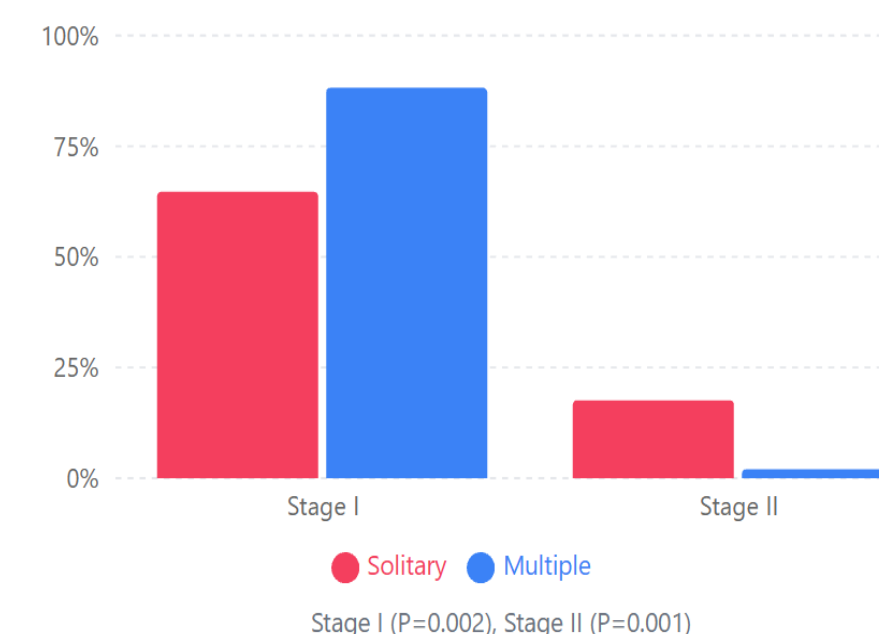
Patient Demographics



Radiological Morphology



Pathological Staging



Surgical & Molecular

