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Cessation of cigarette smoking and the impact on cancer incidence in the D:A:D Study

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On behalf of the D:A:D Study group

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D:A:D

UCL

Disclosure

Ms Leah Shepherd has no financial relationships with commercial entities to disclose.

Background

- Cancers are a major source of morbidity and mortality in HIV-positive [HIV+] persons in the context of available treatment, due to longer life expectancy, reduced immune function and behavioural factors [1]

- HIV+ persons often have higher smoking rates than similar HIV- persons[2]

- The incidence of most cancers, including lung, increase with older age. Therefore, as the HIV+ population ages, smoking cessation is a critically important evidence-based modifiable risk factor for cancer [3]

- The decline in cancer incidence with longer time since cessation is well established in the HIV-negative population [4]

- The clinical benefits of smoking cessation on cancer risk have not been reported for HIV+ persons

1. Smith *et al* 2014, Lancet;2. Browning *et al* 2013, Clin Chest Med; 3. Hasse *et al* 2011, CID; 4. Fry *et al* 2013, Regulatory Toxicology and Pharmacology

Study objective

To estimate cancer rates after smoking cessation in HIV+ persons from the D:A:D study.

Methods

- All persons with no reported history of cancer at baseline were included

- Baseline: latest of study entry or 1 January 2004

- Persons were followed from baseline until earliest of
  - First cancer diagnosis
  - Death
  - Last visit plus 6 months
  - 1 February 2015 (administrative censoring date)

Smoking status[1]

- **Current smoker**
- **Never smoker**
- **Ex smoker at baseline:** those who stopped smoking prior to baseline
- **Ex smoker during follow up**: those who stopped smoking during follow-up

[1] Smoking status represents current smoking behaviour and is time updated

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  < 1 year since cessation

  1 – 2 years

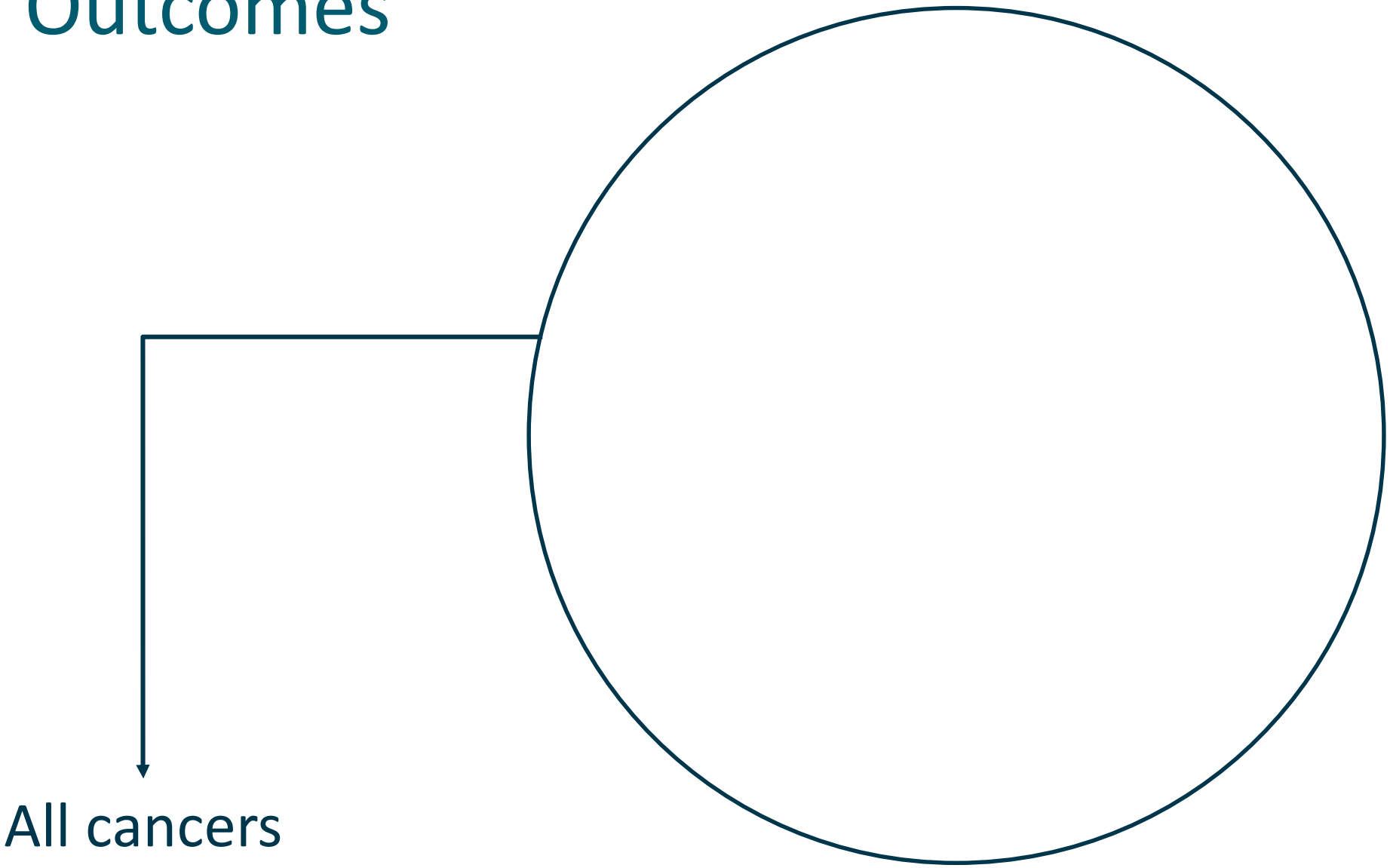
  2 – 3 years

  3 – 5 years

  > 5 years

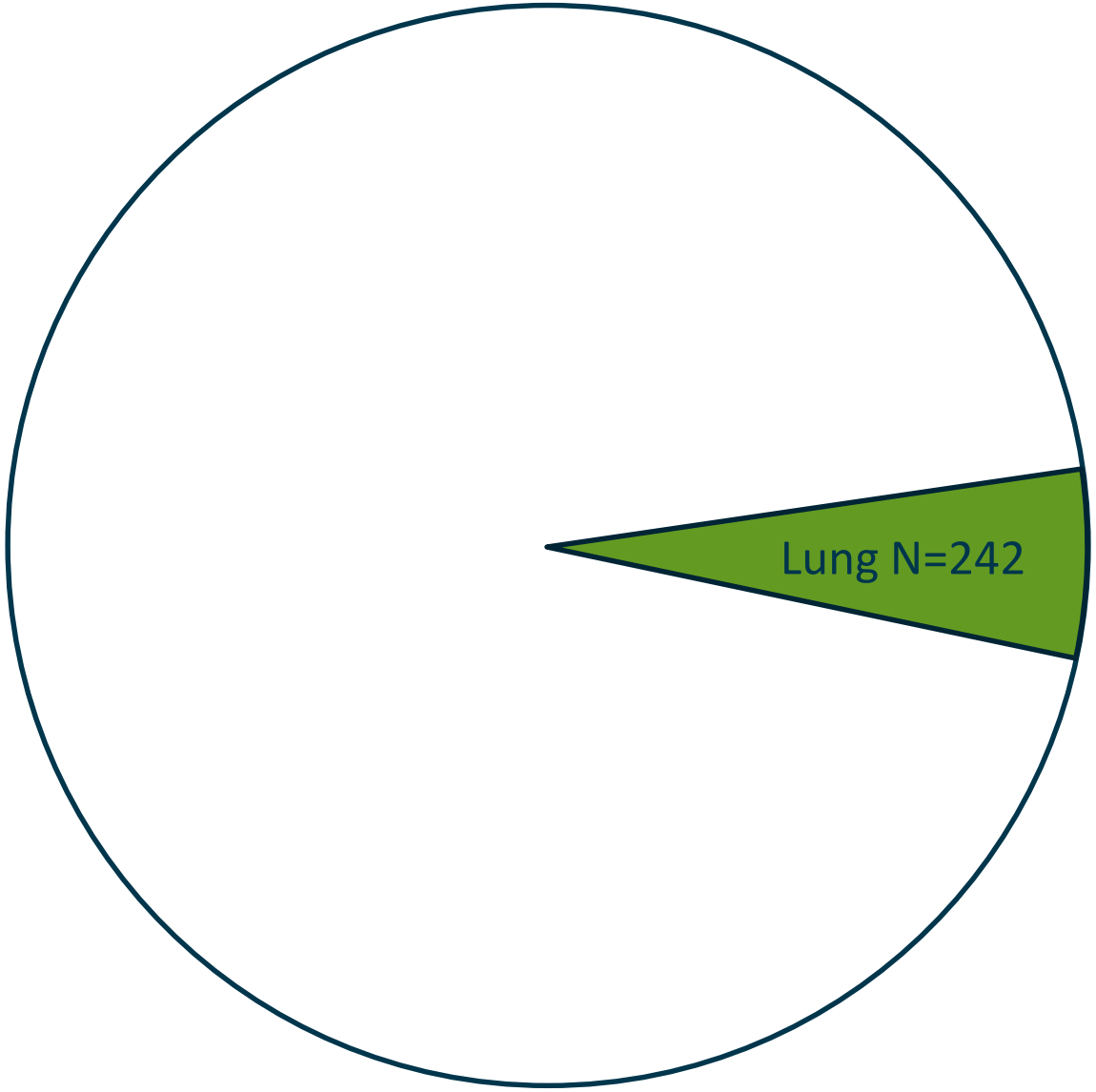
[1] Smoking status represents current smoking behaviour and is time updated

Outcomes



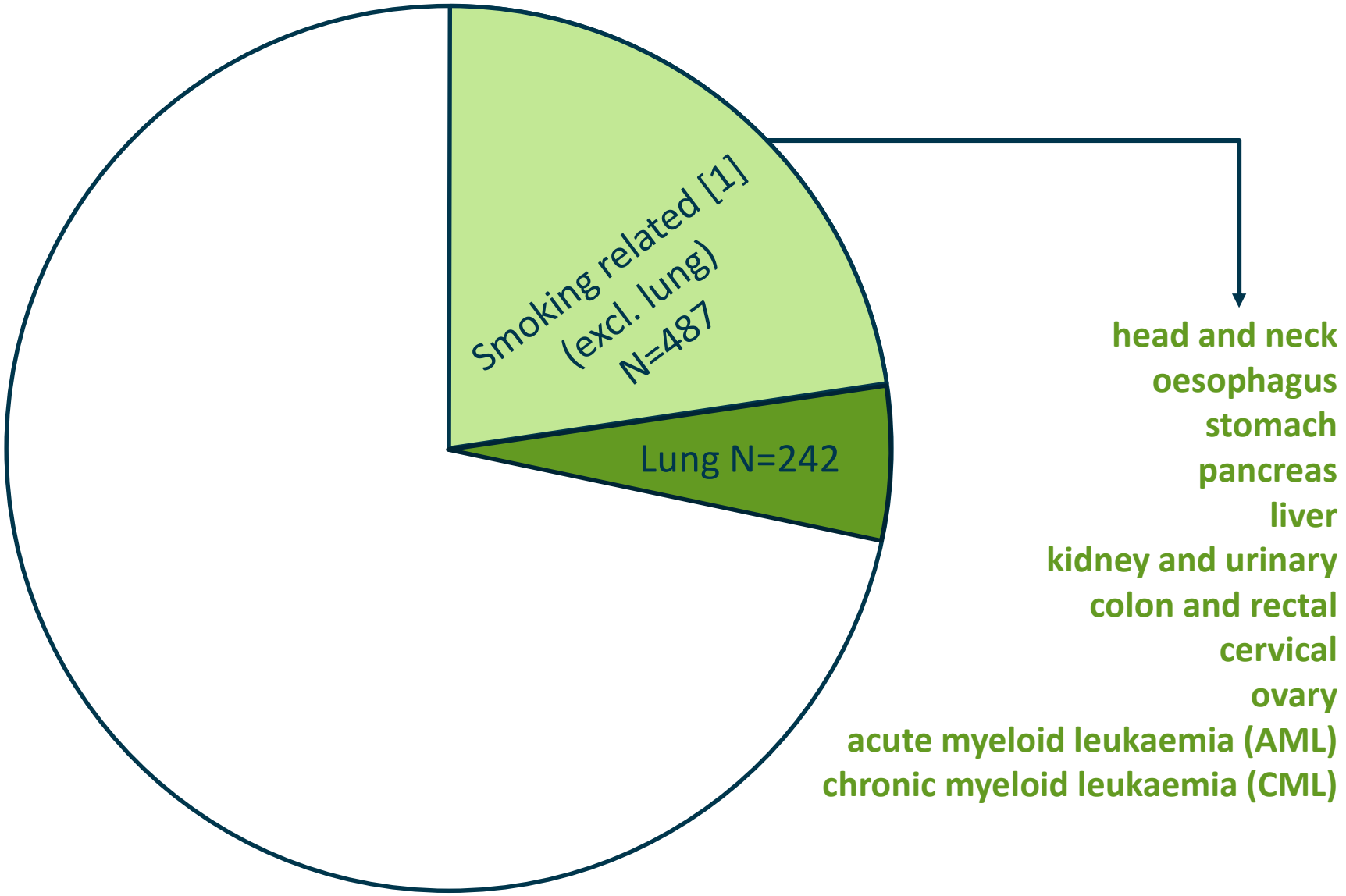
All cancers
N=1980

Outcomes



1. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans

Outcomes



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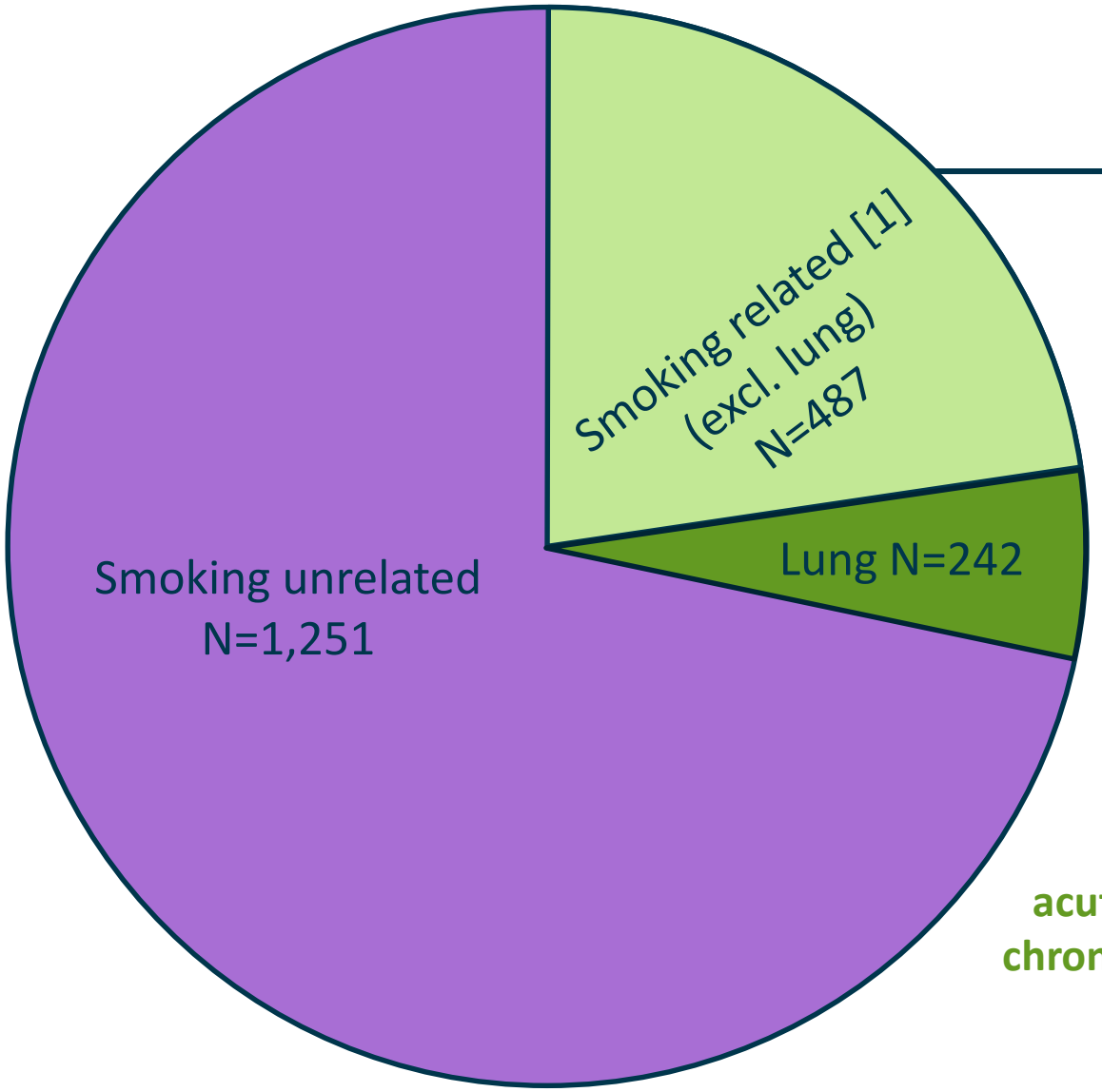


head and neck
oesophagus
stomach
pancreas
liver
kidney and urinary
colon and rectal
cervical
ovary
acute myeloid leukaemia (AML)
chronic myeloid leukaemia (CML)

1. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans

Statistical methods

Models were adjusted for

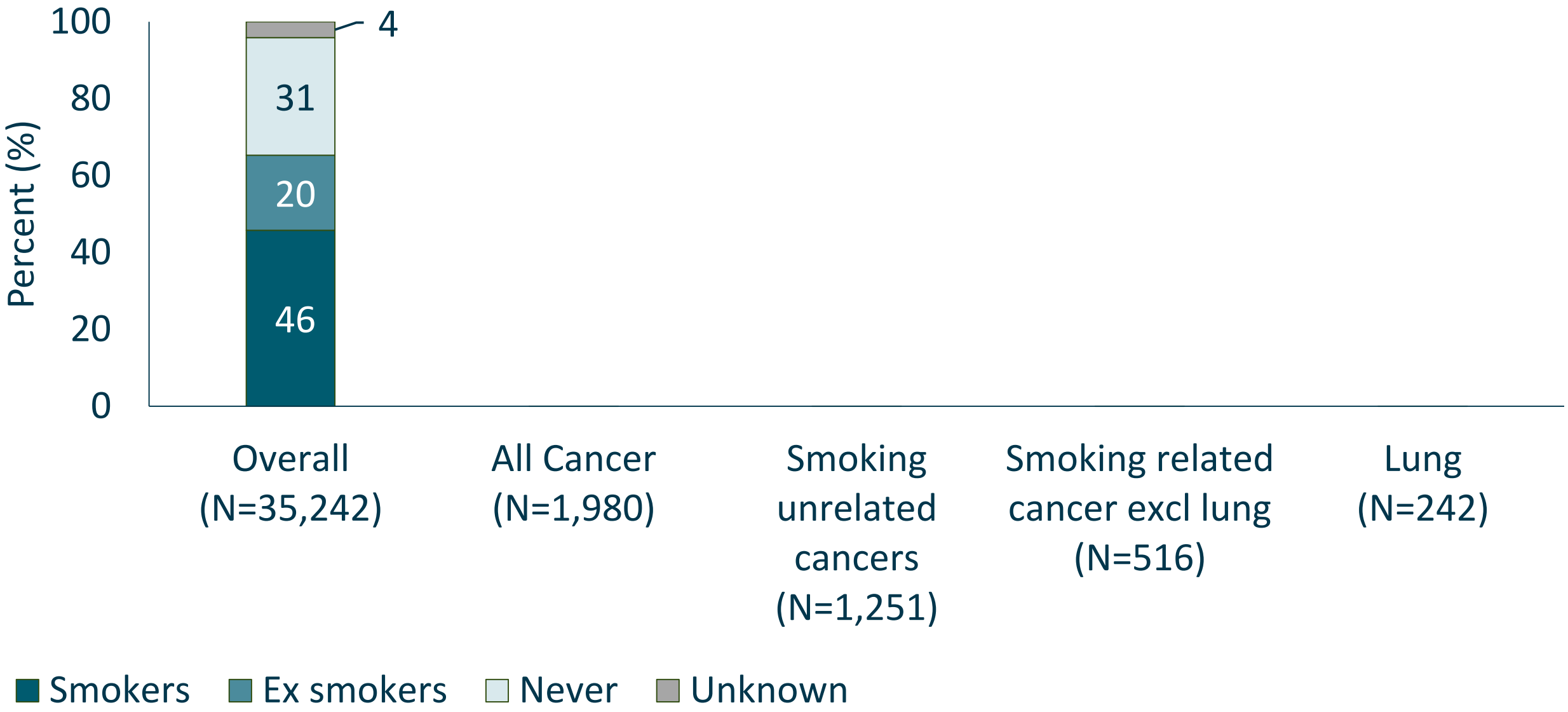
age, gender, transmission group, race, BMI, calendar year, cART use, CD4, HIV viral-load, hepatitis B and C status, AIDS defining events (excluding cancers), anaemia, hypertension, diabetes, cardiovascular disease and duration of smoking in D:A:D

Characteristics at baseline

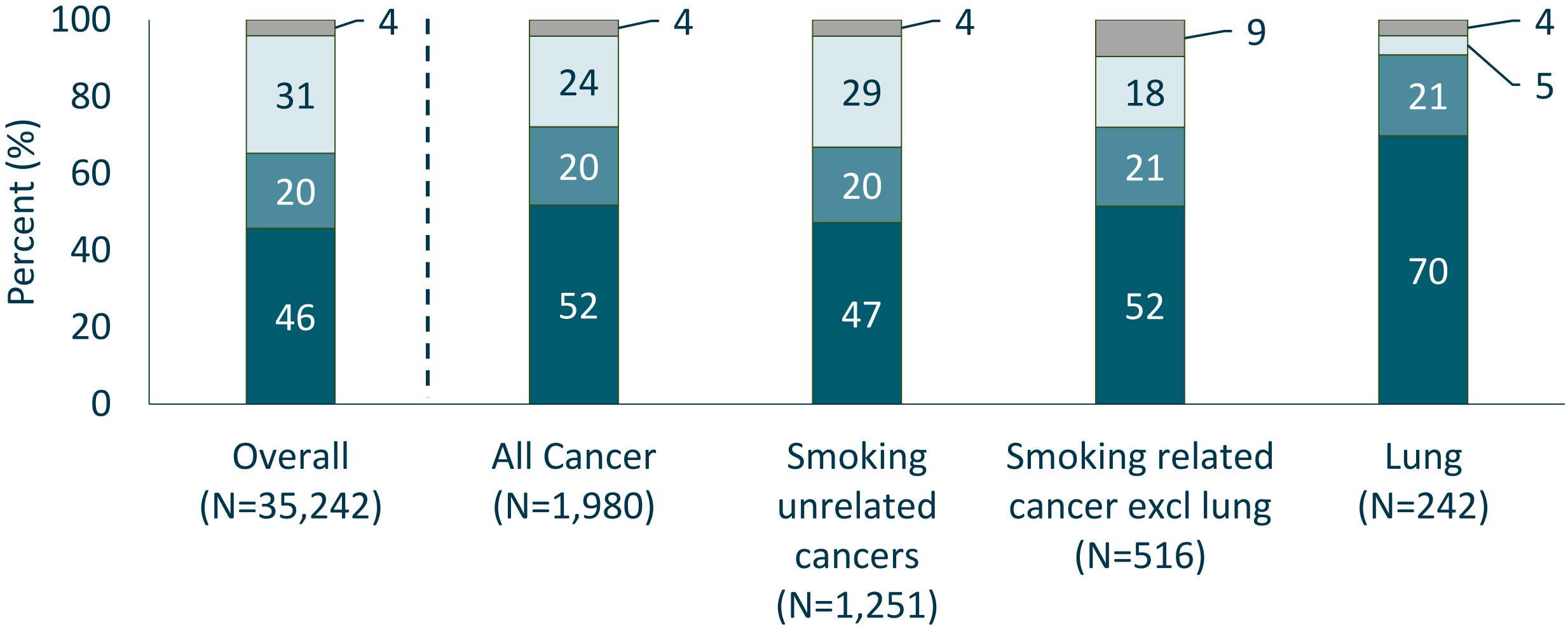
35,424 people contributed 285,103 person years of follow-up with a median of 9 (IQR: 6 – 11) years per person

Factors	All persons (N=35,424)
N %	
Male	25,689 (72.5)
Transmission mode	
Sex between men	14,875 (42.0)
Injecting drug use	5,658 (16.0)
Prior AIDS diagnosis	7,371 (20.8)
HIV Viral load < 500 cps/mL	18,659 (52.7)
Median IQR	
Age (years)	40 (34-46)
CD4 (cells/mm^3)	444 (295-632)

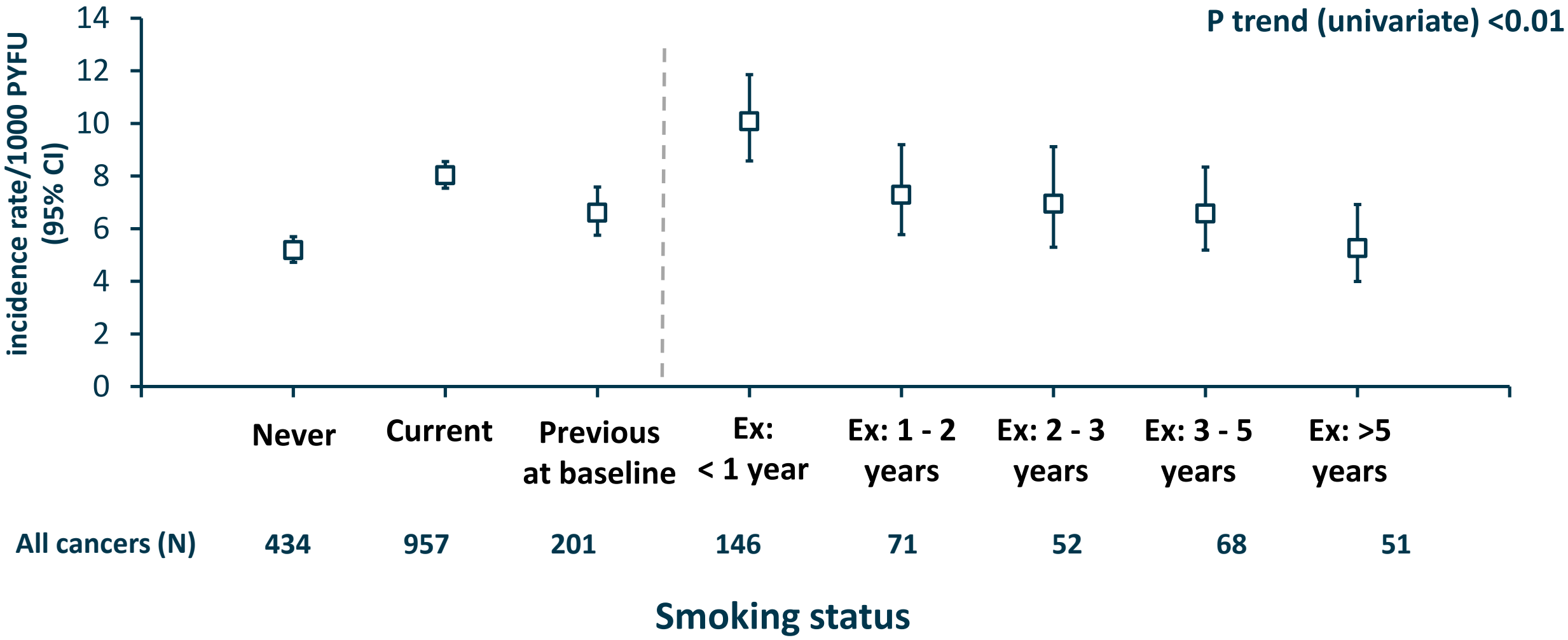
Smoking status at baseline



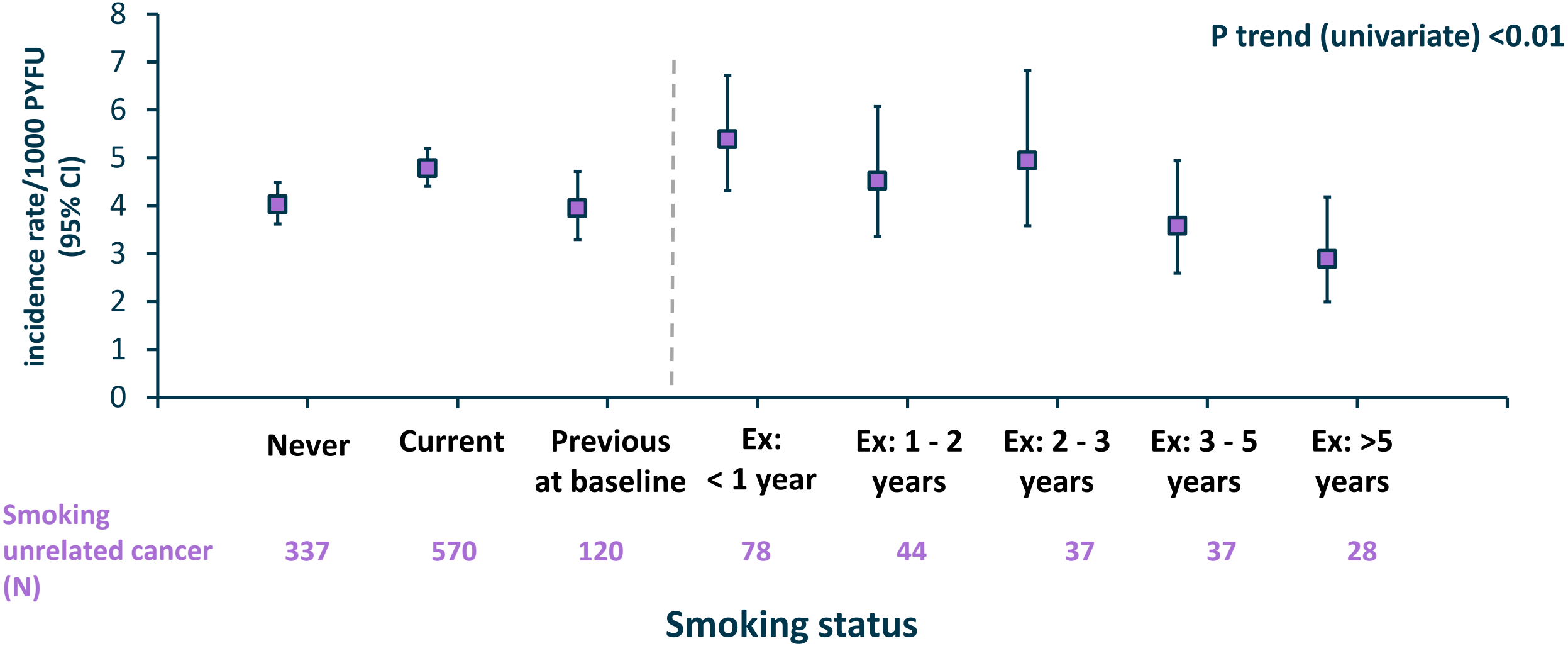
Smoking status at baseline



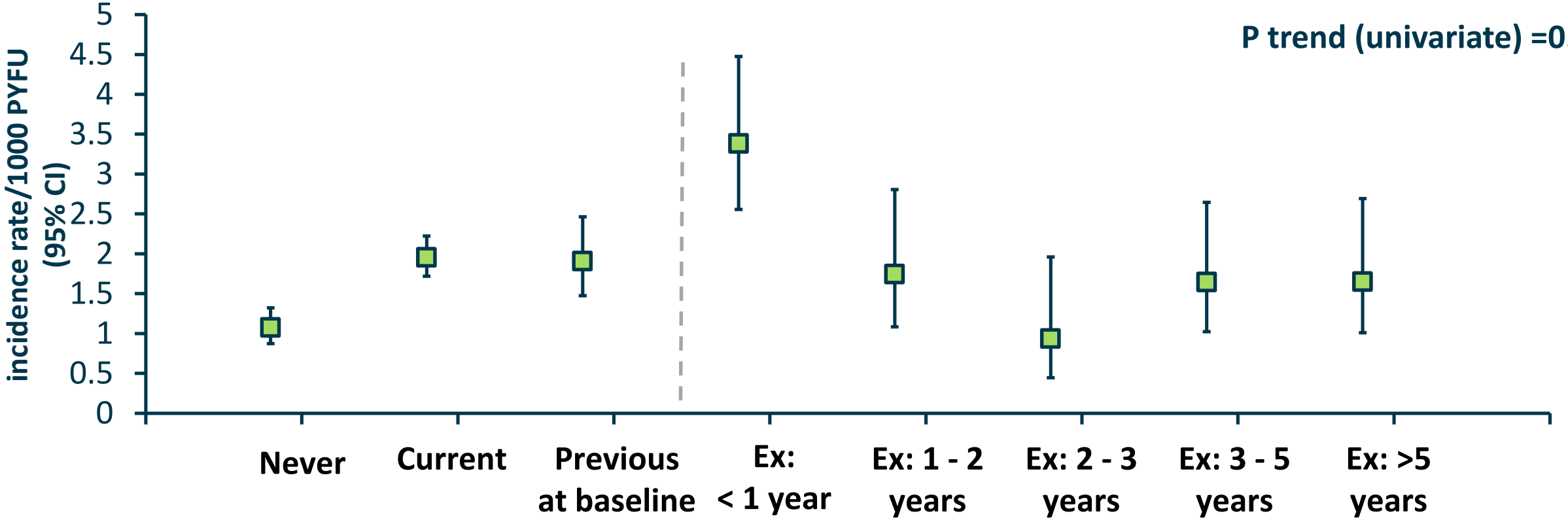
Crude incidence: All cancers



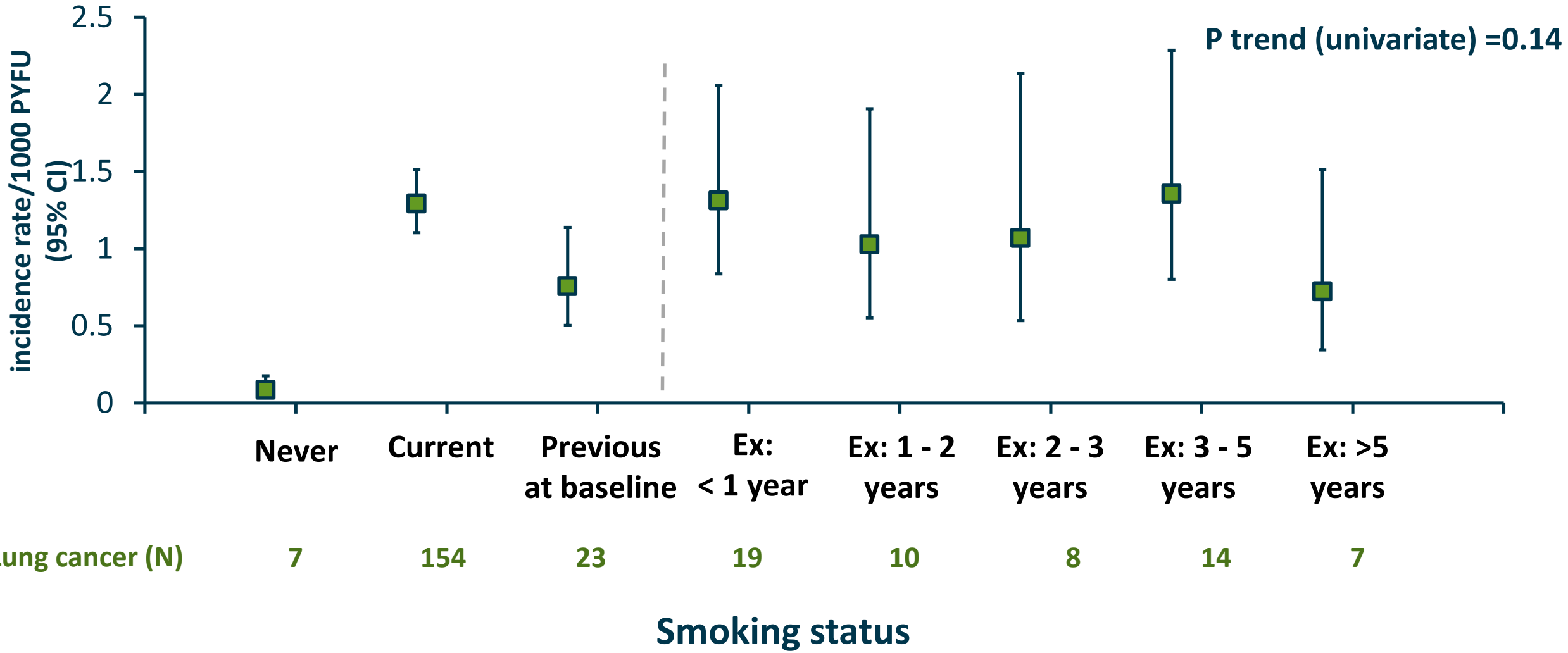
Crude incidence: Smoking unrelated cancer



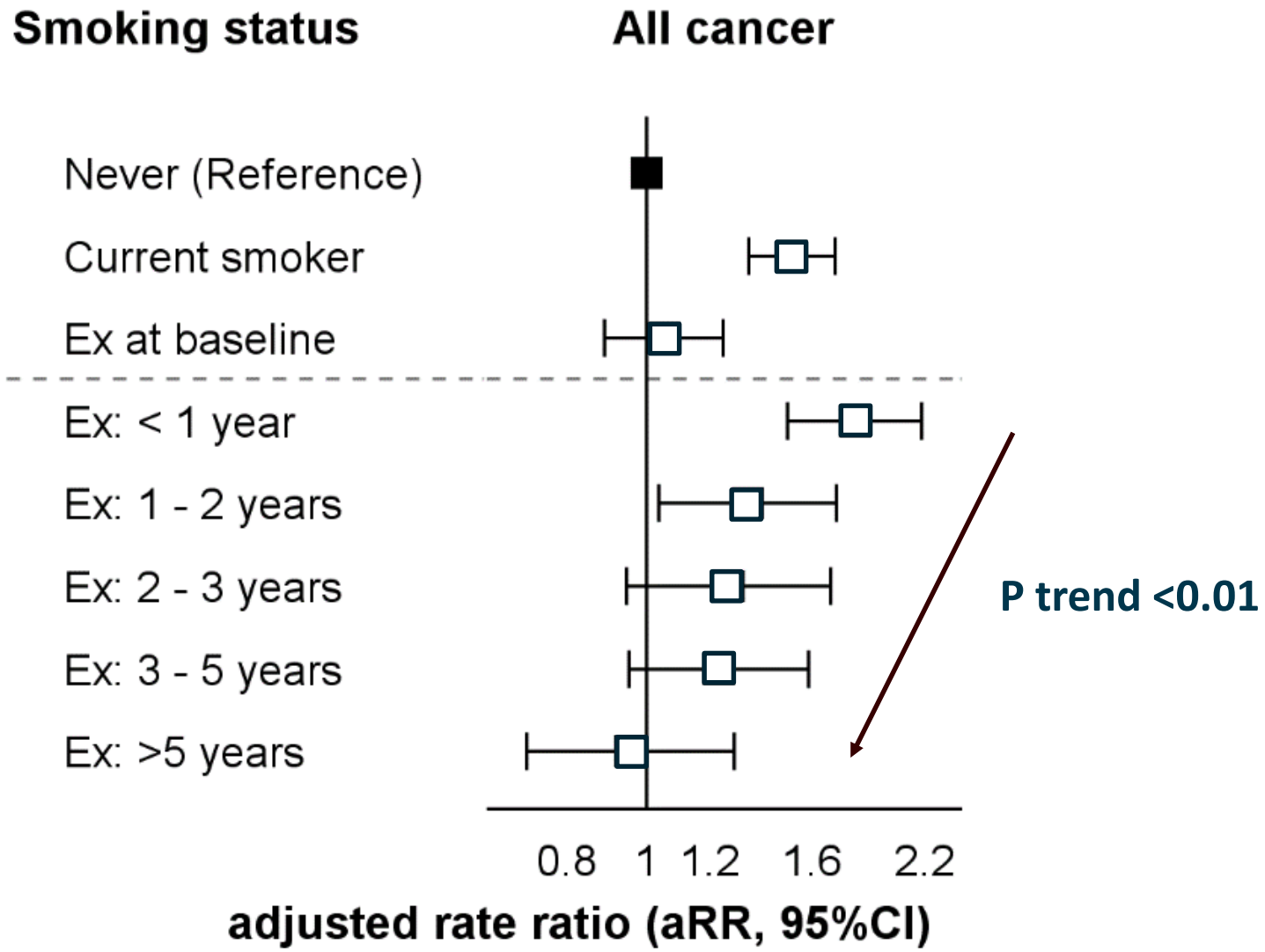
Crude incidence: Smoking related cancer (excl lung)



Crude incidence: Lung cancer

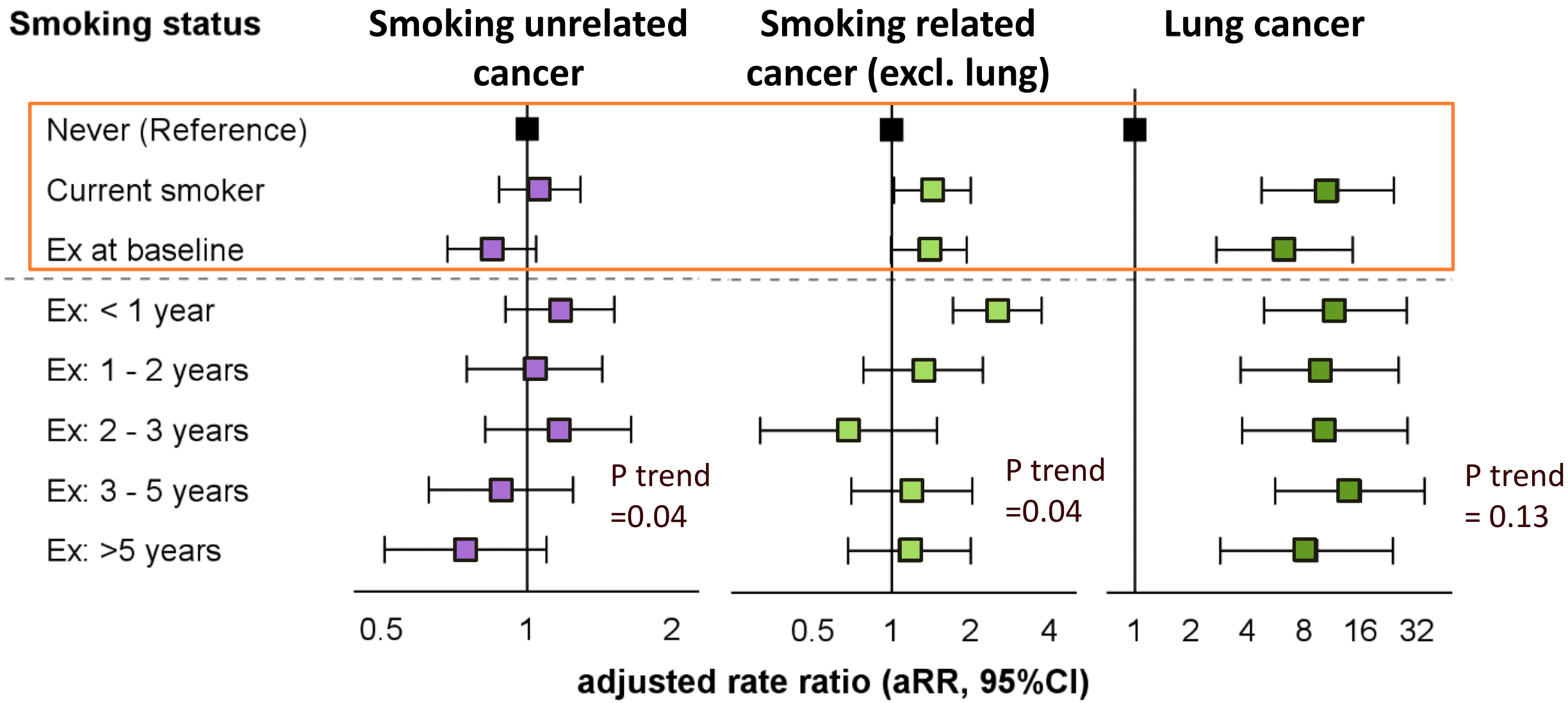


Adjusted rate ratios for all cancer



Models were adjusted for age, gender, transmission group, race, BMI, calendar year, cART use, CD4, HIV viral-load, hepatitis B and C status, AIDS defining events (excluding cancers), anaemia, hypertension, diabetes, cardiovascular disease and duration of smoking in D:A:D

Adjusted rate ratios for specific cancer



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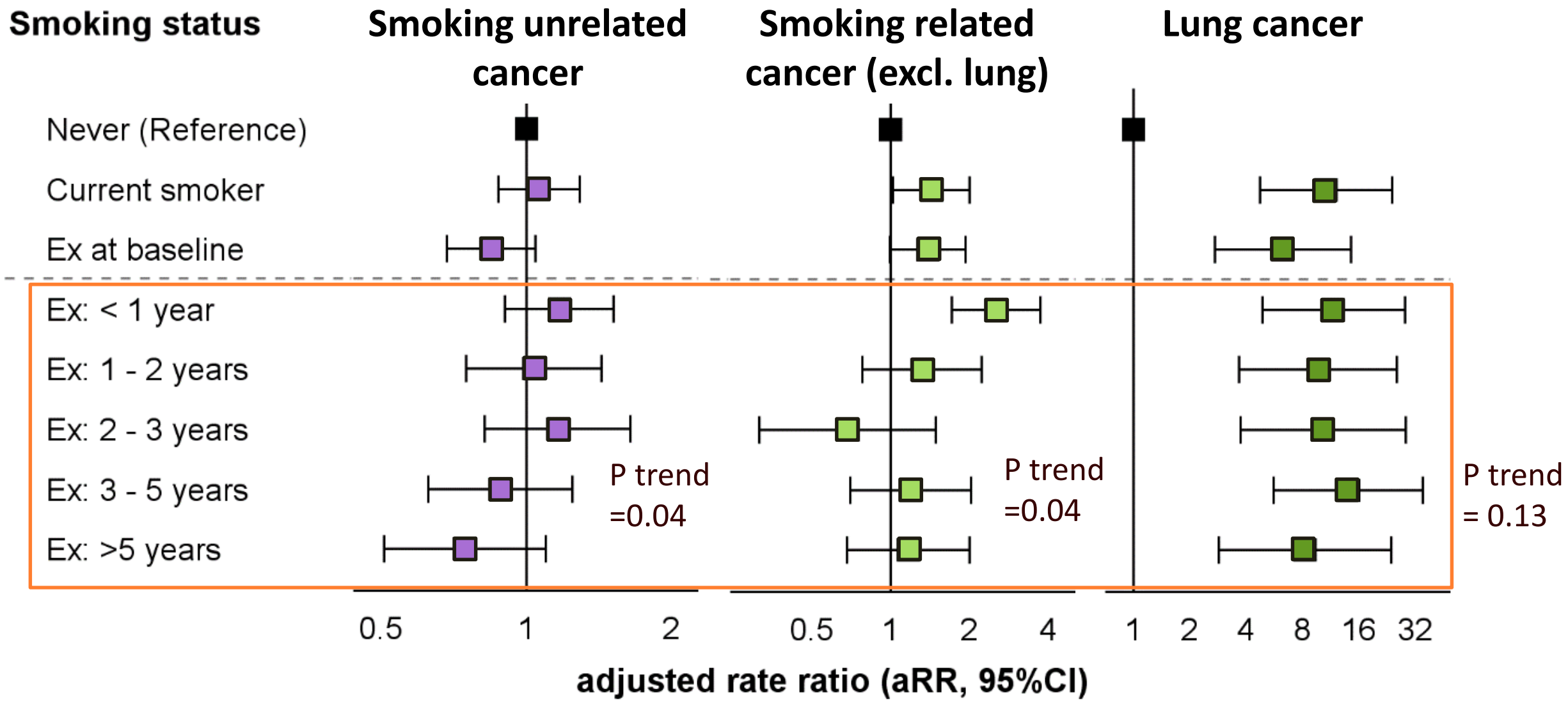

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Limitations

- Smoking data collected at each clinic visit. No information on exact start/stop dates, intensity, duration or pack years
- Smoking status is collected inconsistently on some patients. Sensitivity analysis excluding persons with no smoking update in the last 2 years had similar results
- Observational study

Conclusions 1

- Incidence of smoking related cancers excluding lung rapidly declined following cessation
- Lung cancer incidence appears to remain elevated in HIV+ persons several years after cessation. This suggests that the oncogenic potential for smoking is not reversed for lung cancer in the time frame that we have investigated
- This is in contrast with similar studies in HIV negative persons, which show a consistent decline in lung cancer incidence with increasing time since cessation

Conclusions 2

- Deterring uptake of smoking and smoking cessation efforts should be a priority to reduce the risk of cancer, however, monitoring and awareness of lung cancer should continue in those who stop smoking
- Our study followed persons for a median of 9 years, however studies in the HIV- population follow people for as long as 30 years
- Studies with long follow-up as HIV+ persons age are needed to identify whether and when lung cancer incidence declines

Acknowledgements

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