

Sex-Specific Associations Between Smoking Burden and Cardiometabolic, Psychosocial, and Socioeconomic Factors in a Large Italian Primary Prevention Cohort: Baseline Analysis from the CV-PREVITAL Trial

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BACKGROUND

- Smoking is associated with multiple cardiovascular risk domains
- Sex-specific patterns in these associations remain poorly defined
- Large real-world multidimensional datasets are limited
- CV-PREVITAL provides deep phenotyping in >27,000 adults

OBJECTIVES

To characterise **sex-specific** associations between smoking exposure and vascular risk factors, carotid atherosclerosis and cardiometabolic diseases, and to explore cross-sectional relationships with psychosocial and psycho-behavioural characteristics.

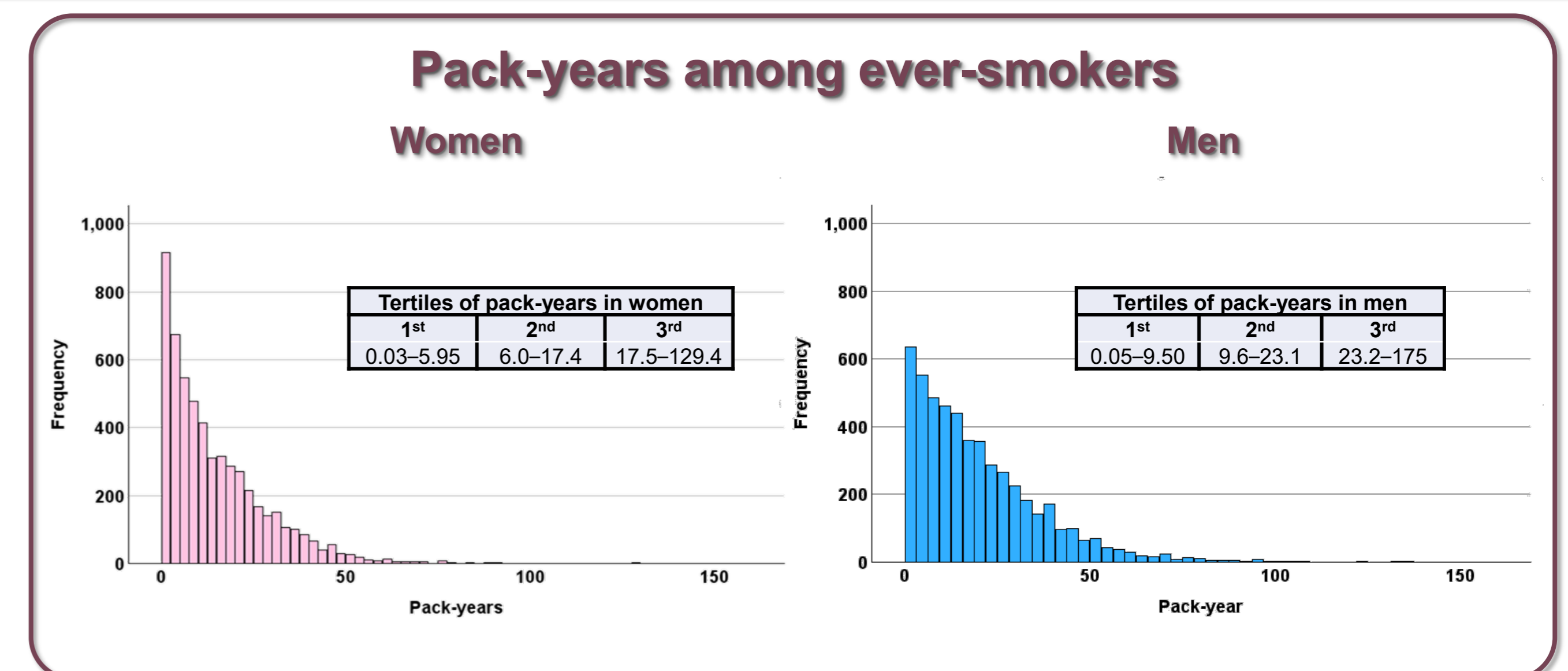
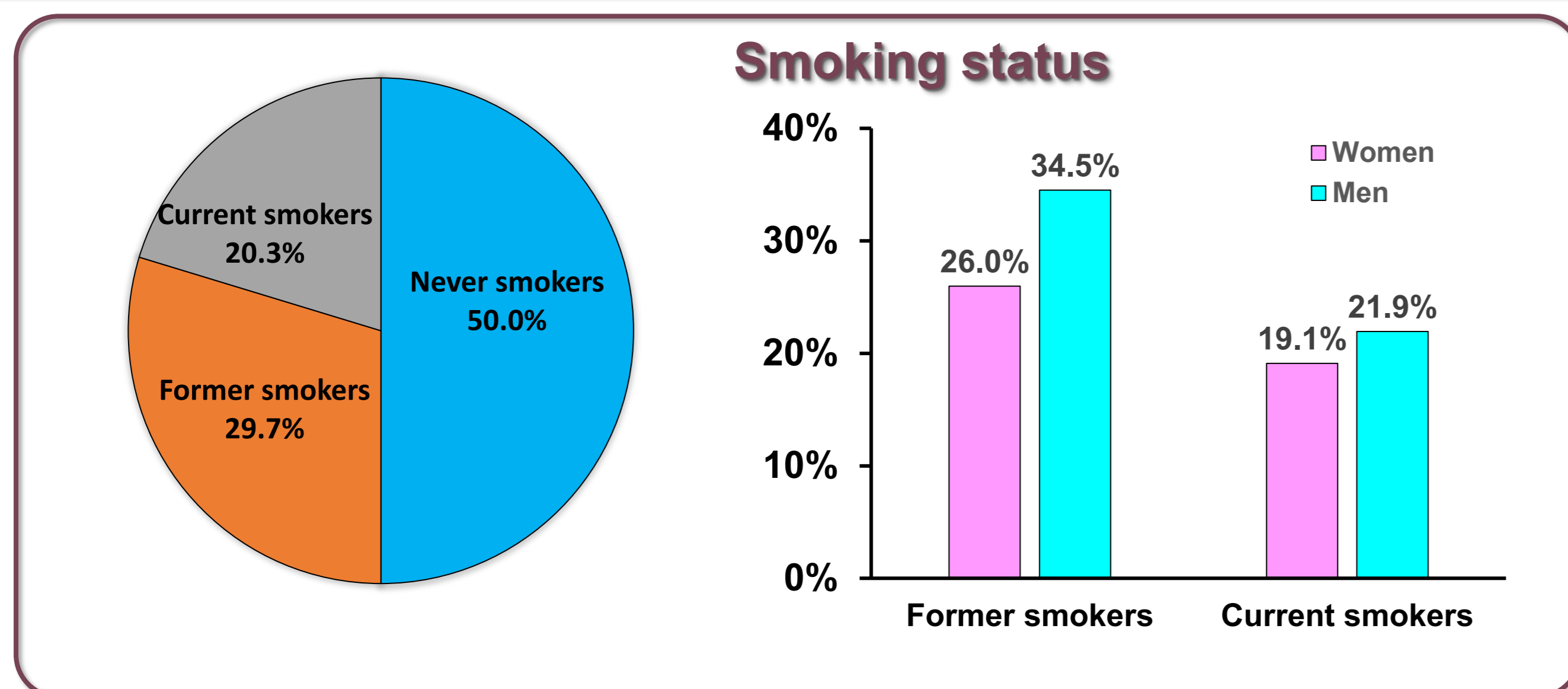
METHODS

CV-PREVITAL study: nationwide, multicentre, randomised trial of a mobile-health intervention for primary cardiovascular prevention in Italy

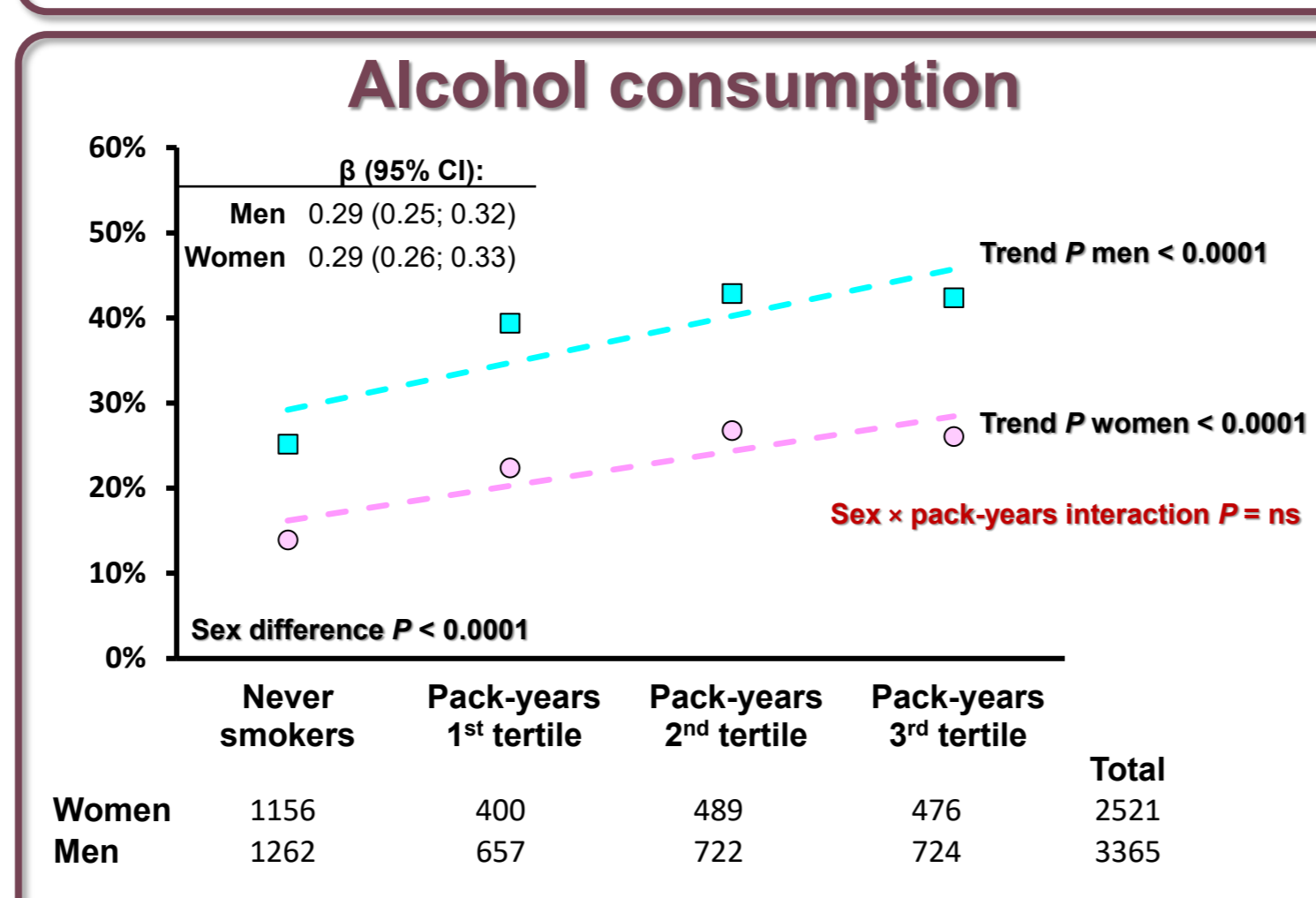
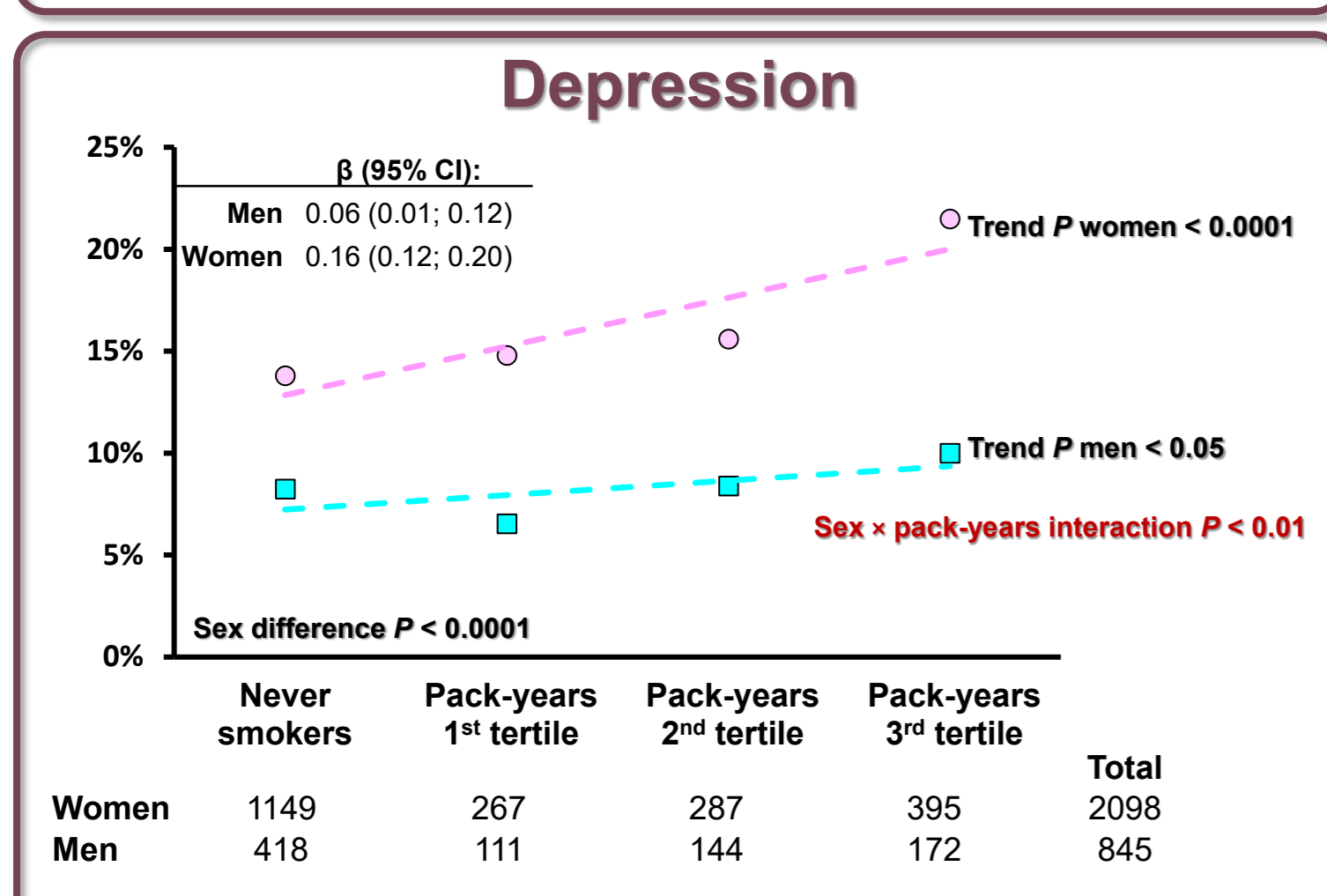
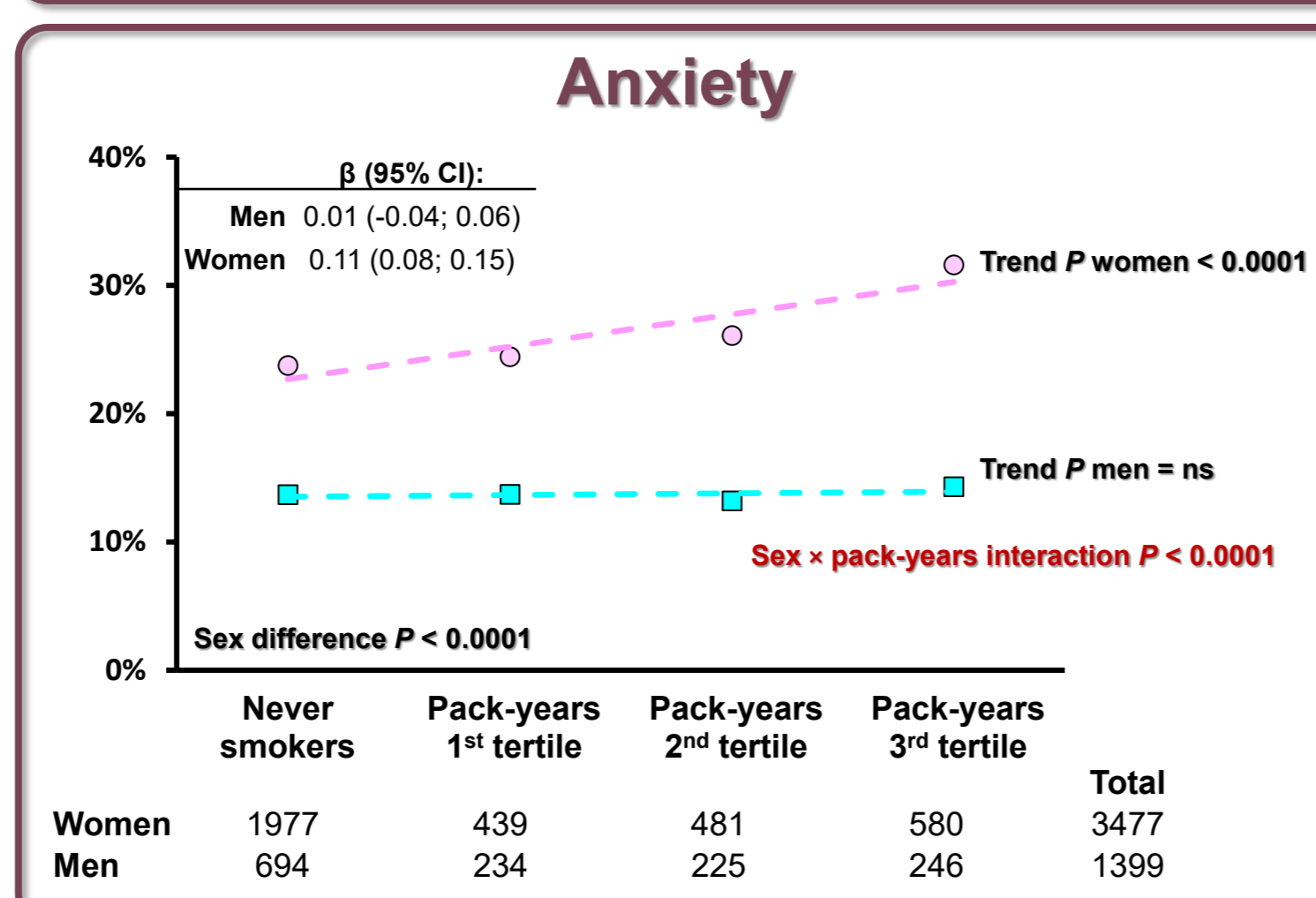
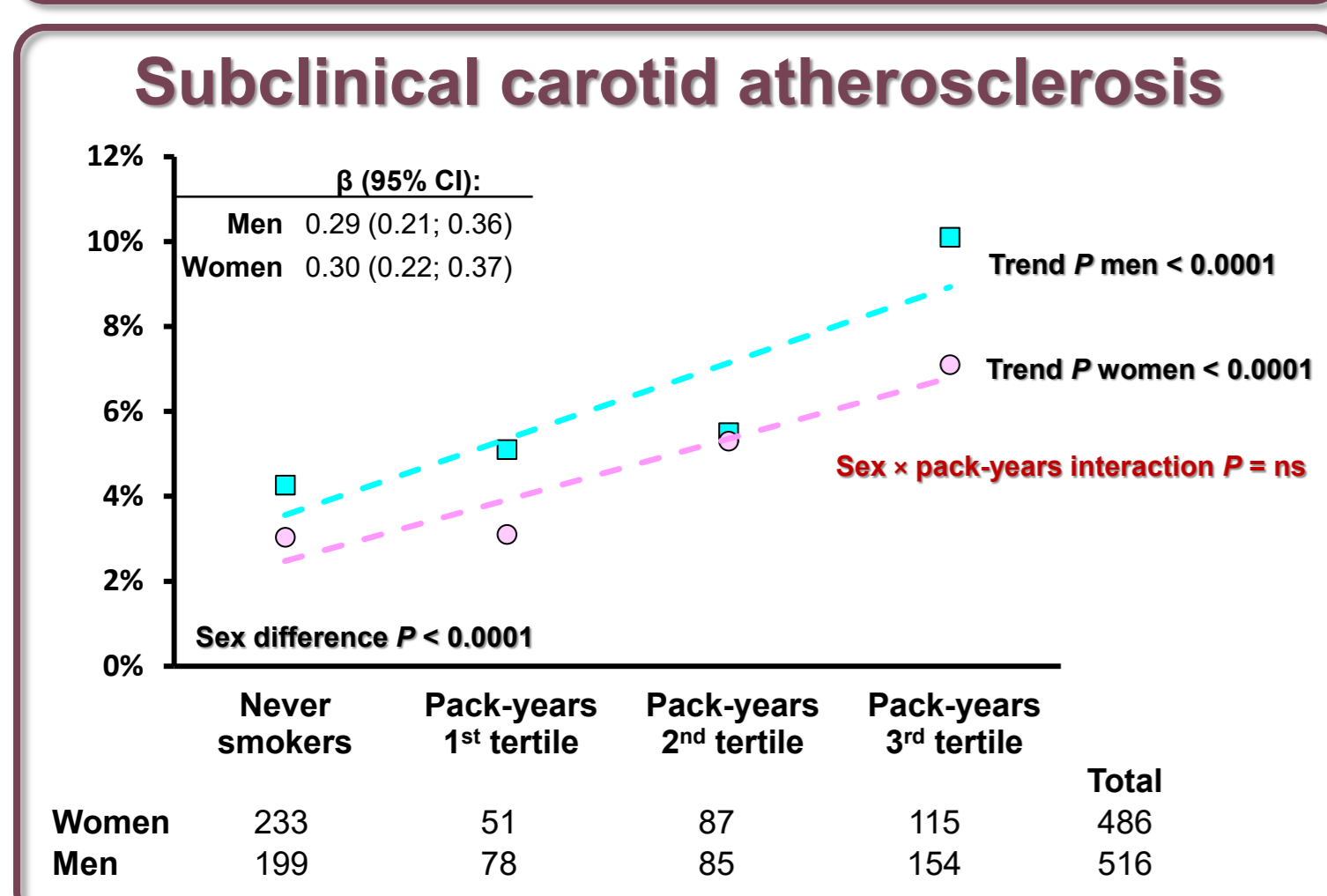
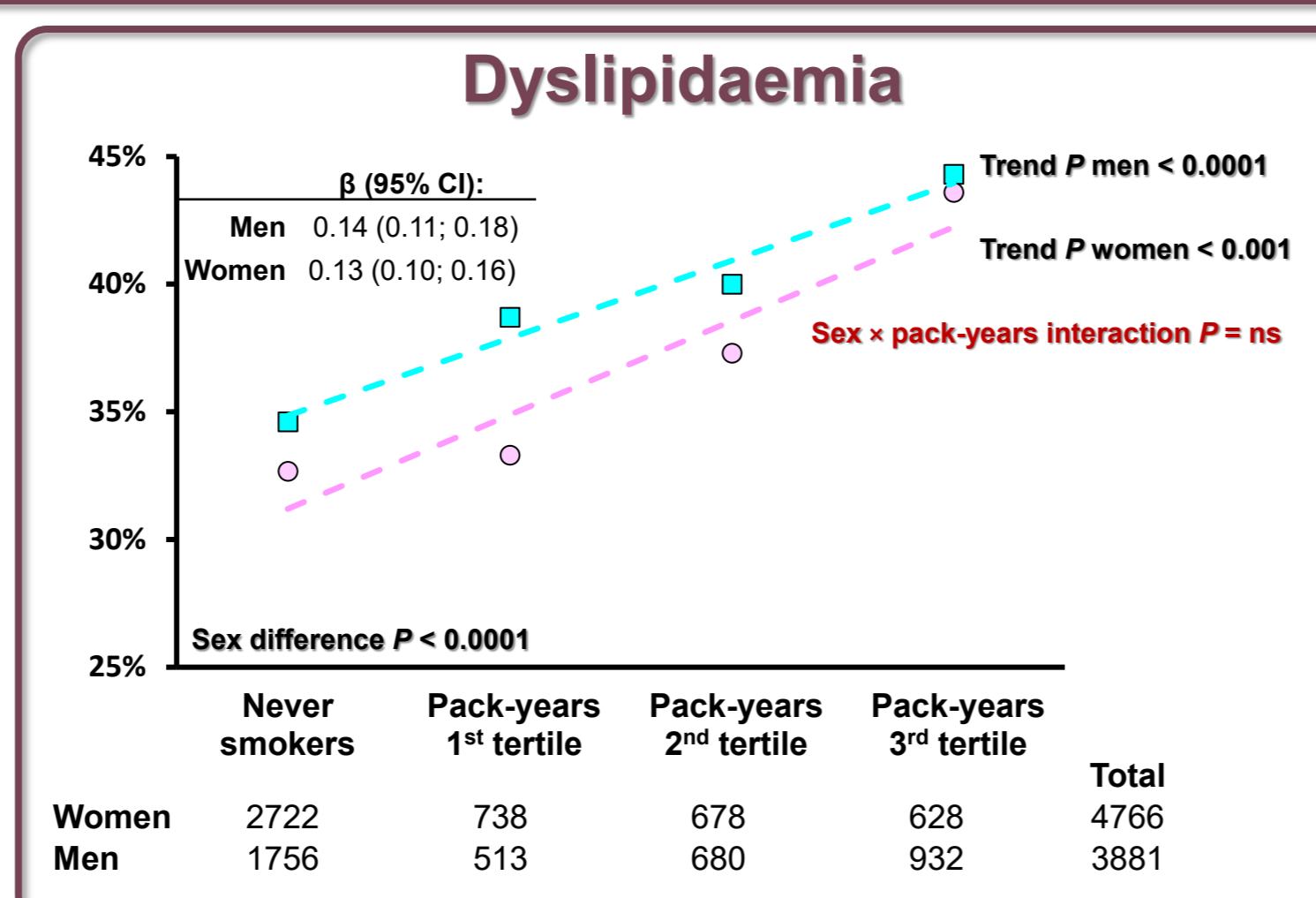
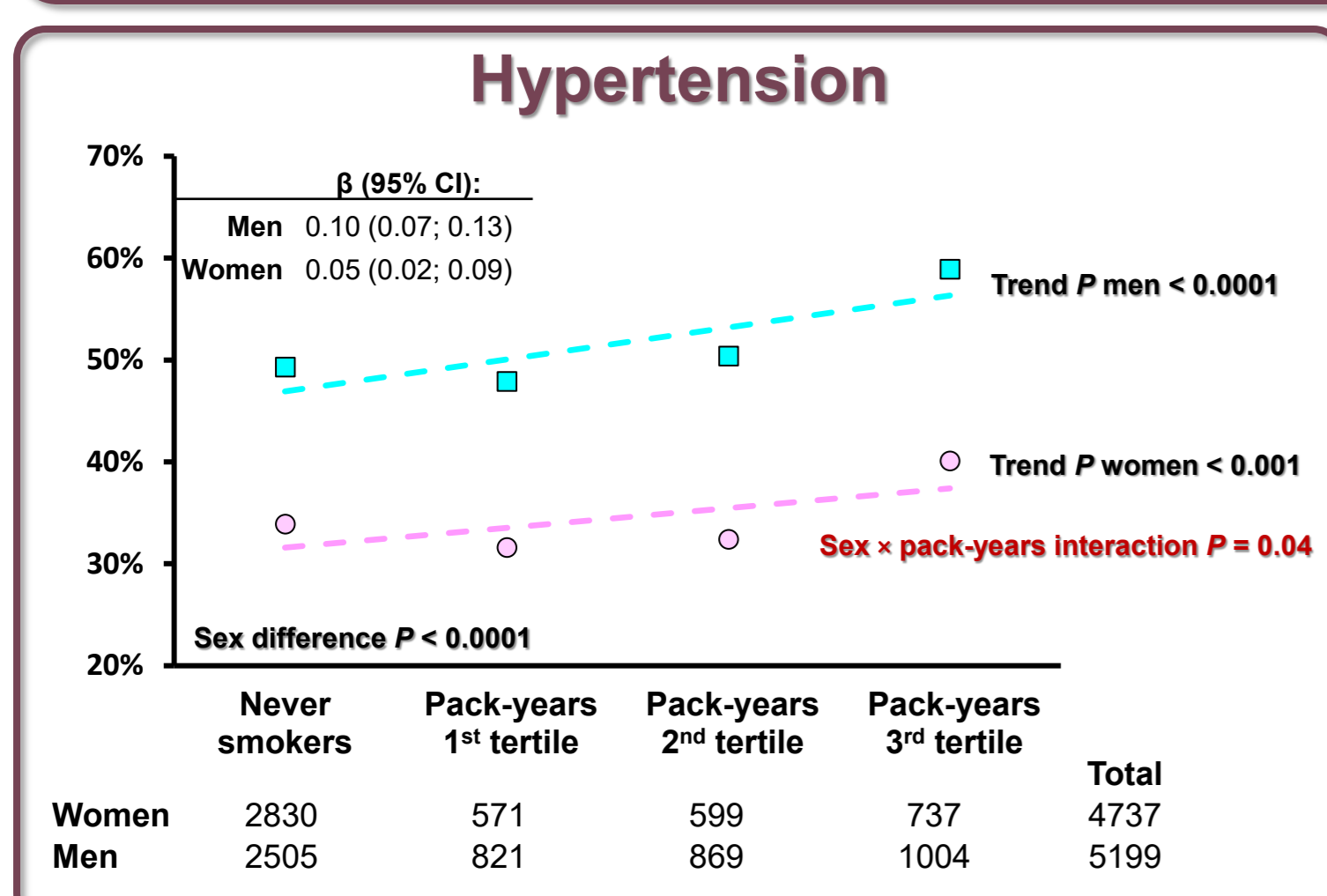
PARTICIPANTS: 27,560 adults aged ≥45 years, including 57% women [median age 57 (51; 63) years] and 43% men [median age 58 (52; 64) years], recruited through general practitioners, IRCCS hospitals and community pharmacies; baseline data only.

STATISTICAL ANALYSIS: Sex-stratified analyses across pack-year categories evaluated the prevalence of cardiometabolic diagnoses, carotid atherosclerosis, psychosocial factors, socioeconomic indicators and lifestyle behaviours. Smoking exposure was categorised as never smoking plus sex-specific tertiles of pack-years among ever-smokers. Trends and smoking–sex interactions were tested using generalised linear models.

RESULTS



Model-derived trends in factor prevalence across smoking-burden categories



	Women β (95% CI)	Men β (95% CI)	Sex × pack-years interaction P value
Type 2 diabetes	0.01 (-0.06; 0.07)	0.23 (0.17; 0.29) [#]	<0.0001
Respiratory disease	0.13 (0.09; 0.18) [#]	0.12 (0.07; 0.17) [#]	ns
Kidney disorder	0.08 (0.01; 0.14) [*]	0.08 (0.01; 0.14) [*]	ns
Living in a large city	0.12 (0.08; 0.15) [#]	0.02 (-0.02; 0.06)	<0.0001
Low educational attainment	0.08 (0.04; 0.11) [#]	0.20 (0.18; 0.25) [#]	<0.0001
Unemployment	0.15 (0.11; 0.19) [#]	0.19 (0.15; 0.23) [#]	ns
Non-home ownership	0.25 (0.20; 0.30) [#]	0.20 (0.14; 0.26) [#]	ns
High-risk propensity	0.13 (0.08; 0.17) [#]	0.09 (0.05; 0.13) [#]	ns
Perceived stress	0.03 (-0.02; 0.06)	-0.05 (-0.08; -0.01) [*]	0.001
Self-efficacy	0.02 (-0.06; 0.09)	-0.01 (-0.12; 0.11)	ns
Physical activity	-0.04 (-0.07; -0.01) [*]	-0.01 (-0.05; 0.03)	ns
Low-quality diet	0.05 (-0.01; 0.11)	0.07 (0.02; 0.12) [*]	ns
Binge drinking	0.29 (0.25; 0.34) [#]	0.24 (0.20; 0.28) [#]	ns

Baseline sex differences: Except for low educational attainment and non-home ownership, baseline prevalence differed significantly between women and men for all variables, with most P values < 0.0001.

Trend analyses: β coefficients represent model-derived trends in factor prevalence across increasing smoking-burden categories.

indicates trend P < 0.0001; * indicates trend P < 0.05. "ns" indicates a non-significant sex × pack-years interaction. CI, confidence interval.

KEY RESULTS

Beyond traditional cardiovascular risk factors, smoking burden was associated with distinct socioeconomic and behavioural profiles.

- Socioeconomic disadvantage:** higher smoking burden clustered with low educational attainment, unemployment and non-home ownership.
- Sex-specific patterns:** interactions were most evident for living in a large city, low educational attainment and perceived stress.
- Behavioural profile:** high-risk propensity and binge drinking increased across smoking-burden categories in both women and men.

β values indicate model-derived trends in prevalence across smoking-burden categories.

CONCLUSIONS

In this large Italian primary-prevention cohort, smoking burden was associated with a less favourable cardiometabolic, vascular, socioeconomic and behavioural profile. Sex-specific socioeconomic and psychosocial-behavioural patterns may help inform sex-tailored strategies for primary cardiovascular prevention.