

Sex-specific association of atrial fibrillation with mild cognitive impairment: Results from the population-based Heinz Nixdorf Recall Study

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Background: Atrial fibrillation (AF), the most common sustained cardiac arrhythmia, is associated with an increased risk of dementia¹. Studies also indicate a link between AF and mild cognitive impairment (MCI), a precursor of dementia. When controlling for stroke risk, this association is attenuated but remains significant². Initial findings suggest that women with AF may be particularly vulnerable to developing MCI³. The present cross-sectional analysis investigates sex-specific differences in the association between AF and MCI.

Methods: Heinz Nixdorf Recall Study

Prospective, population-based cohort study (t0: n=4814)

- Time point t2 (2010-2015): N=3114, aged 55-85 years.
- Assessment of AF (n=202) and stroke (n=57): Self-reported or medically documented diagnosis.
- In total, n=187 with AF without stroke.
- Neuropsychological test battery (see Fig. 1).
- MCI diagnosis: Performance in at least one cognitive domain (see Fig. 1) below the age- and education-adjusted norm, with a report of subjective cognitive decline.

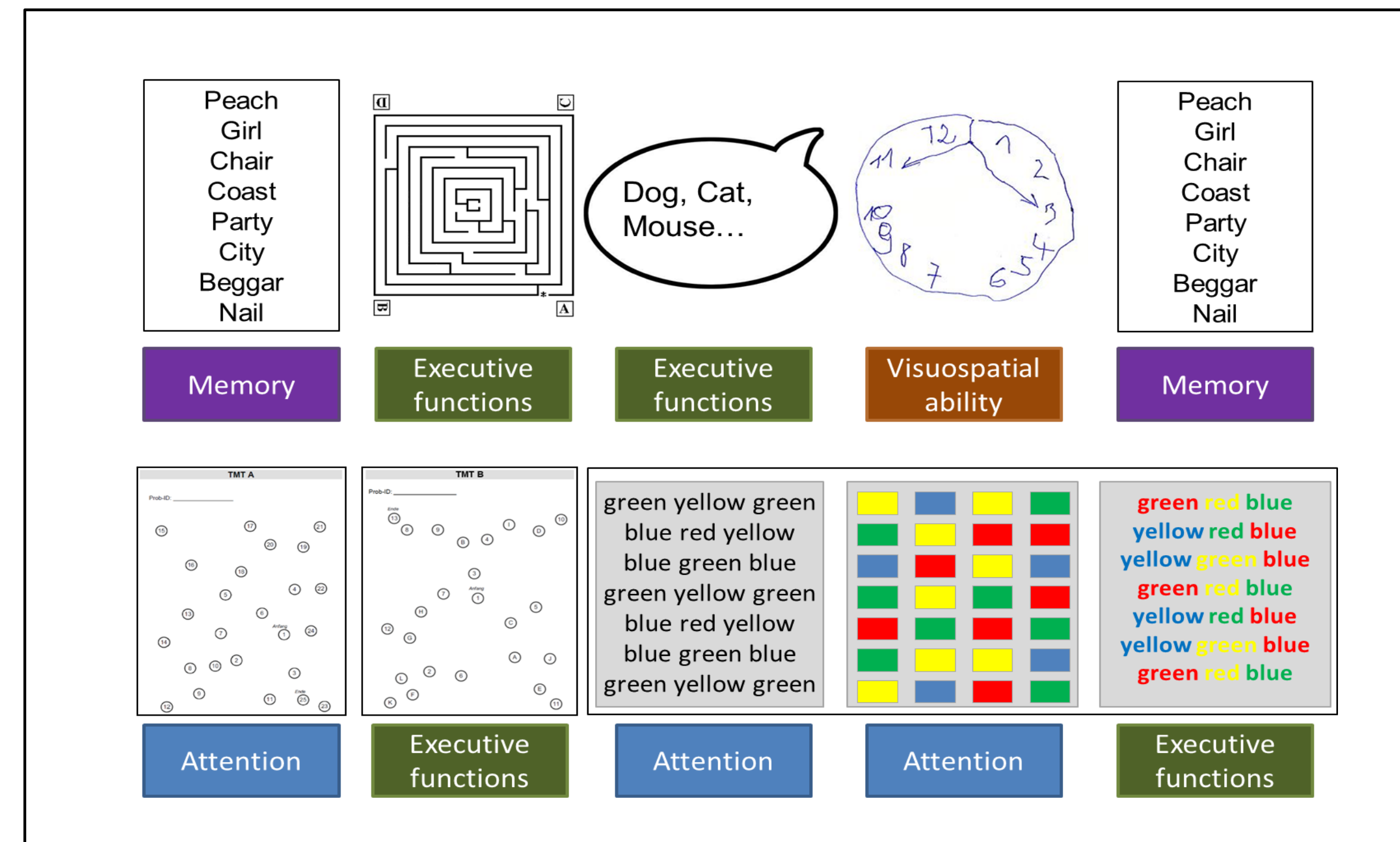


Figure 1. Neuropsychological assessment at t2 with corresponding cognitive domains

- Analysis sample: n=1457 (757 women; average age 68 years), of which n=367 had MCI.
- Prevalence ratios (PR) for the presence of MCI and 95% CIs for AF vs. no AF were calculated using log-binomial regression.
- Analyses were conducted in the total study population and stratified by sex.
- Unadjusted and adjusted models included age, sex (for the total sample only), body mass index (BMI), education, alcohol consumption, smoking status, coronary heart disease (CHD), hypertension, and diabetes mellitus, based on a directed acyclic graph.

Results:

Table 1. Sociodemographic and clinical characteristics of the study population (n=1457) at t2

	Men (n= 700)		Women (n= 757)	
	Ø MCI (n=521)	MCI (n=179)	Ø MCI (n=569)	MCI (n=188)
Age, years, mean ±SD	67.23 ± 6.71	70.04 ± 7.29	67.04 ± 6.86	69.80 ± 7.85
Education				
≤ 10 years, n (%)	17 (3.3)	6 (3.4)	51 (9.0)	28 (14.9)
11-13 years, n (%)	214 (41.1)	78 (43.6)	383 (67.3)	125 (66.5)
14-17 years, n (%)	177 (34.0)	76 (42.5)	69 (12.1)	26 (13.8)
≥18 years, n (%)	113 (21.7)	19 (10.6)	66 (11.6)	9 (4.8)
BMI, kg/m ² , mean ±SD	28.21 ± 3.90	28.29 ± 4.05	28.18 ± 5.58	28.03 ± 5.14
Alcohol, g/day, mean ±SD	19.74 ± 23.78	16.33 ± 22.61	7.30 ± 12.71	7.36 ± 15.80
Smoking				
Never smoked, n (%)	165 (31.7)	57 (31.8)	300 (52.7)	113 (60.1)
Former smoker, n (%)	285 (54.7)	100 (55.9)	187 (32.9)	53 (28.2)
Current smoker, n (%)	71 (13.6)	22 (12.3)	82 (14.4)	22 (11.7)
CHD, n (%)	68 (13.1)	29 (16.2)	17 (3.0)	9 (4.8)
Hypertension, n (%)	175 (33.6)	59 (33.0)	125 (22.0)	45 (24.0)
Diabetes mellitus, n (%)	68 (13.1)	35 (19.6)	50 (8.8)	23 (12.3)
Atrial fibrillation, n (%)	85 (16.3)	34 (19.0)	44 (7.7)	24 (12.8)

MCI: mild cognitive impairment; BMI: body mass index; CHD: coronary heart disease

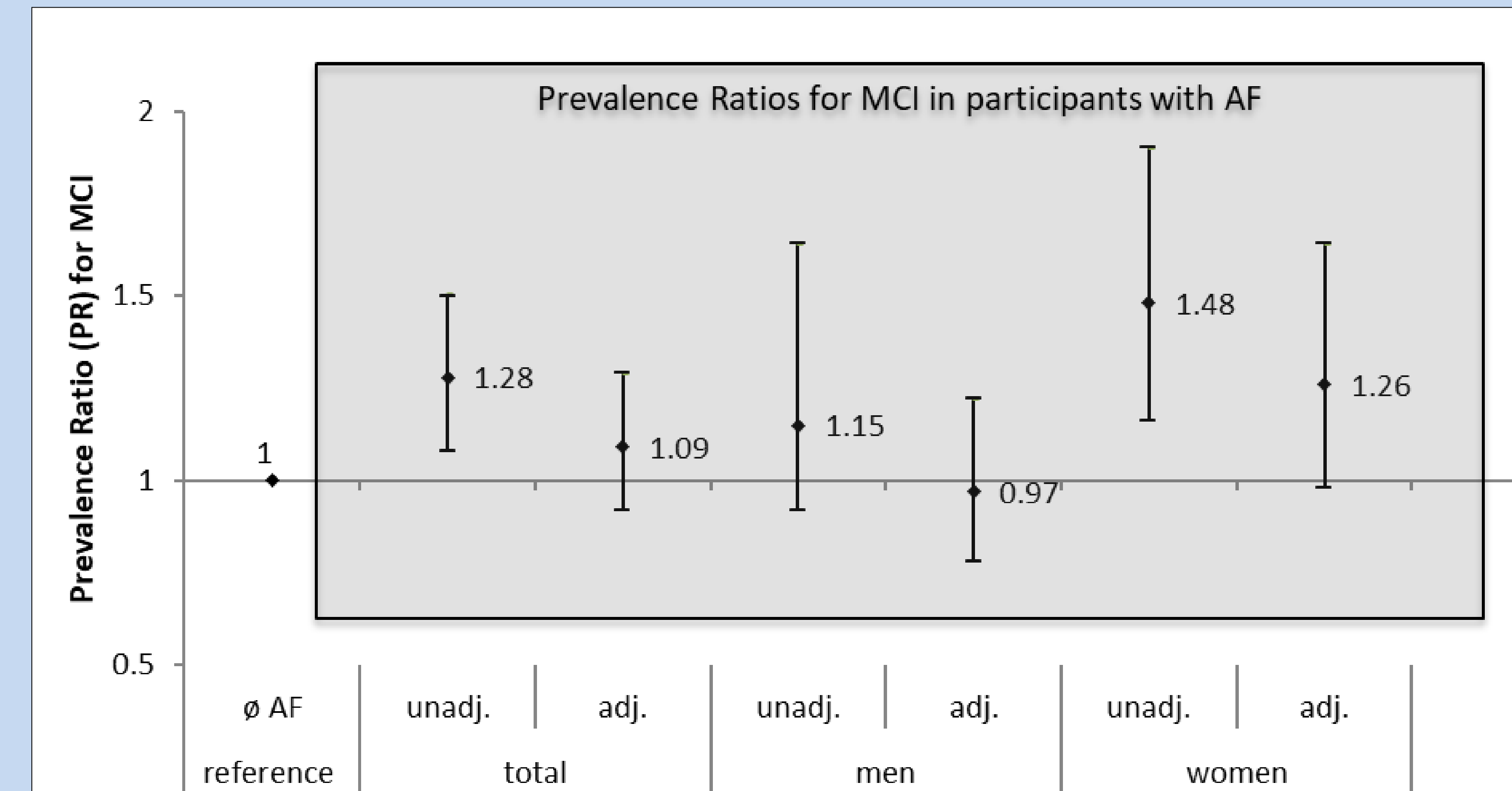


Figure 2. Association between AF and MCI in the total study population and stratified by sex. Prevalence ratios with 95% CIs from log-binomial regression models (unadjusted and adjusted for age, sex (total sample), education, body mass index, alcohol consumption, smoking status, coronary heart disease (CHD), hypertension, and diabetes mellitus).

Conclusion: Despite a lower prevalence of AF in women, the association between AF and MCI is stronger in women than in men. This association is independent of a history of stroke. Larger longitudinal studies are needed to clarify causal pathways and the physiological mechanisms linking AF to MCI.