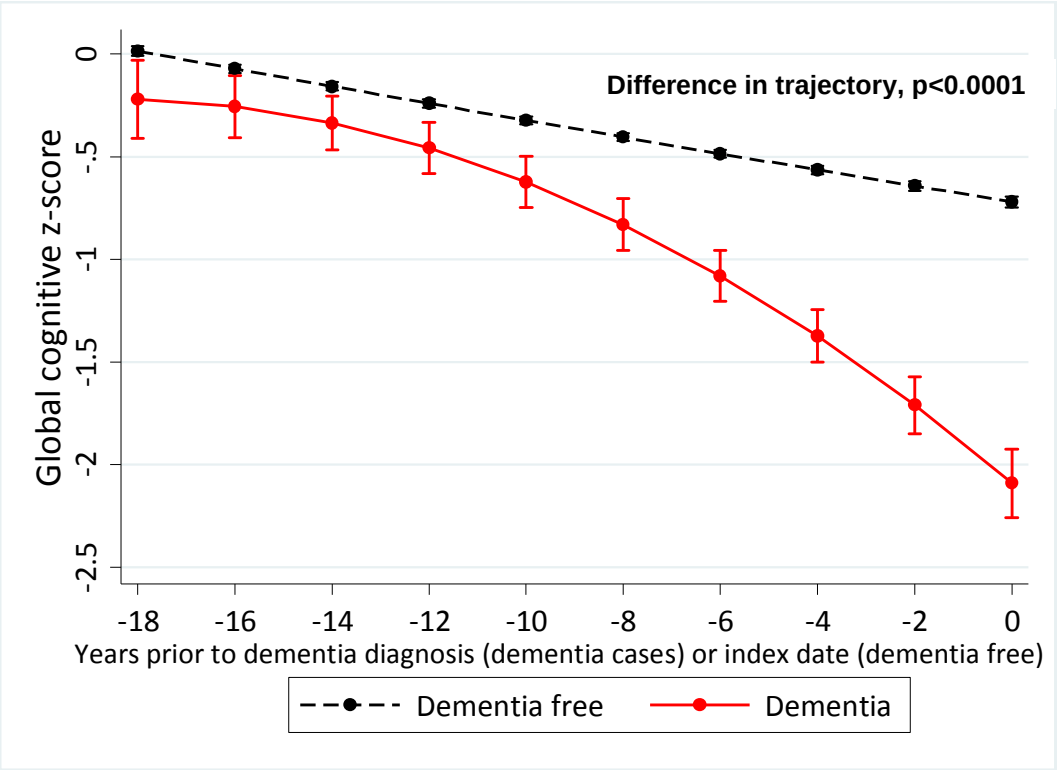
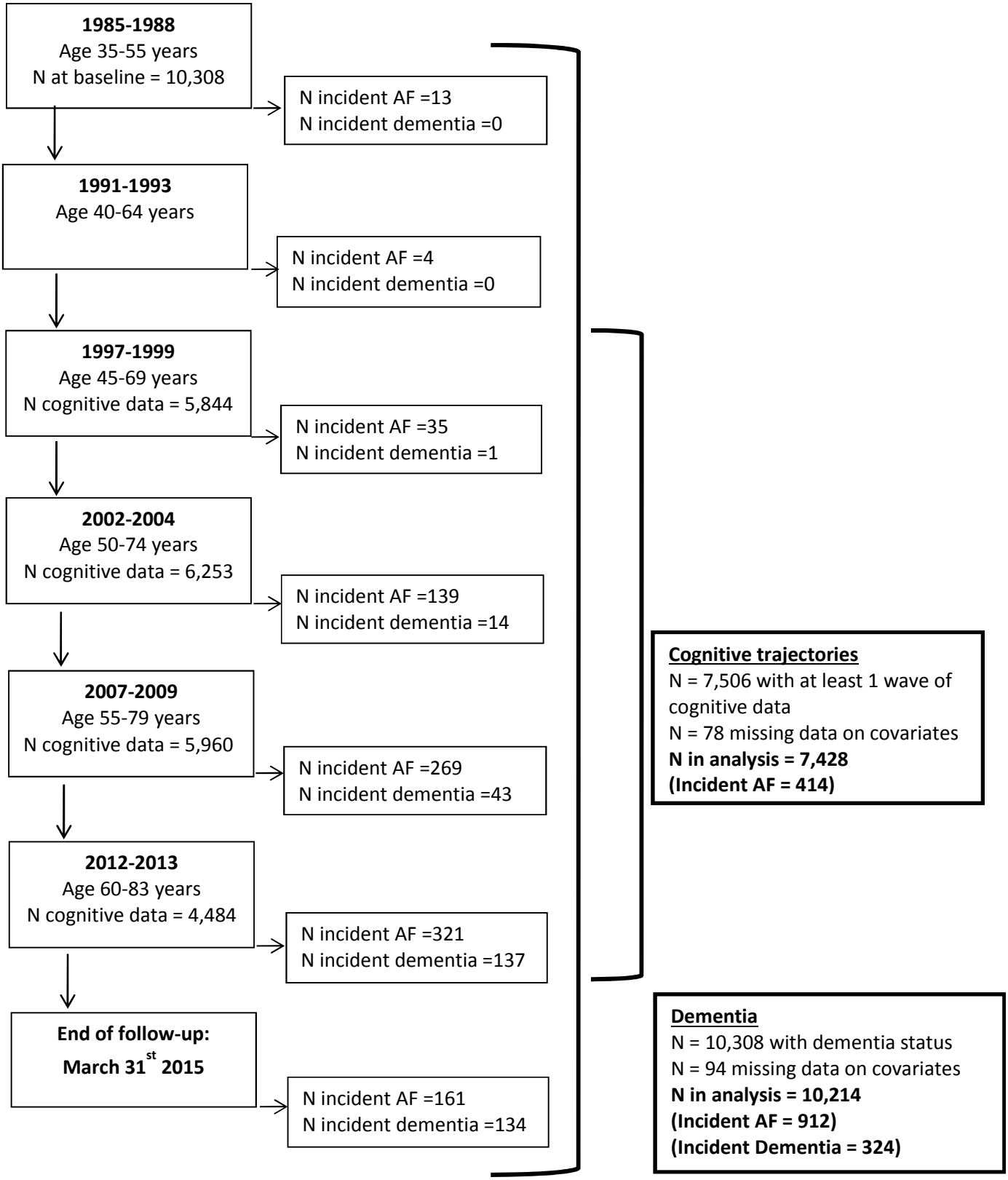
SUPPLEMENTARY DATA

Supplementary Figure S1. Trajectory of global cognitive score in dementia cases and other participants in the years leading to dementia diagnosis.

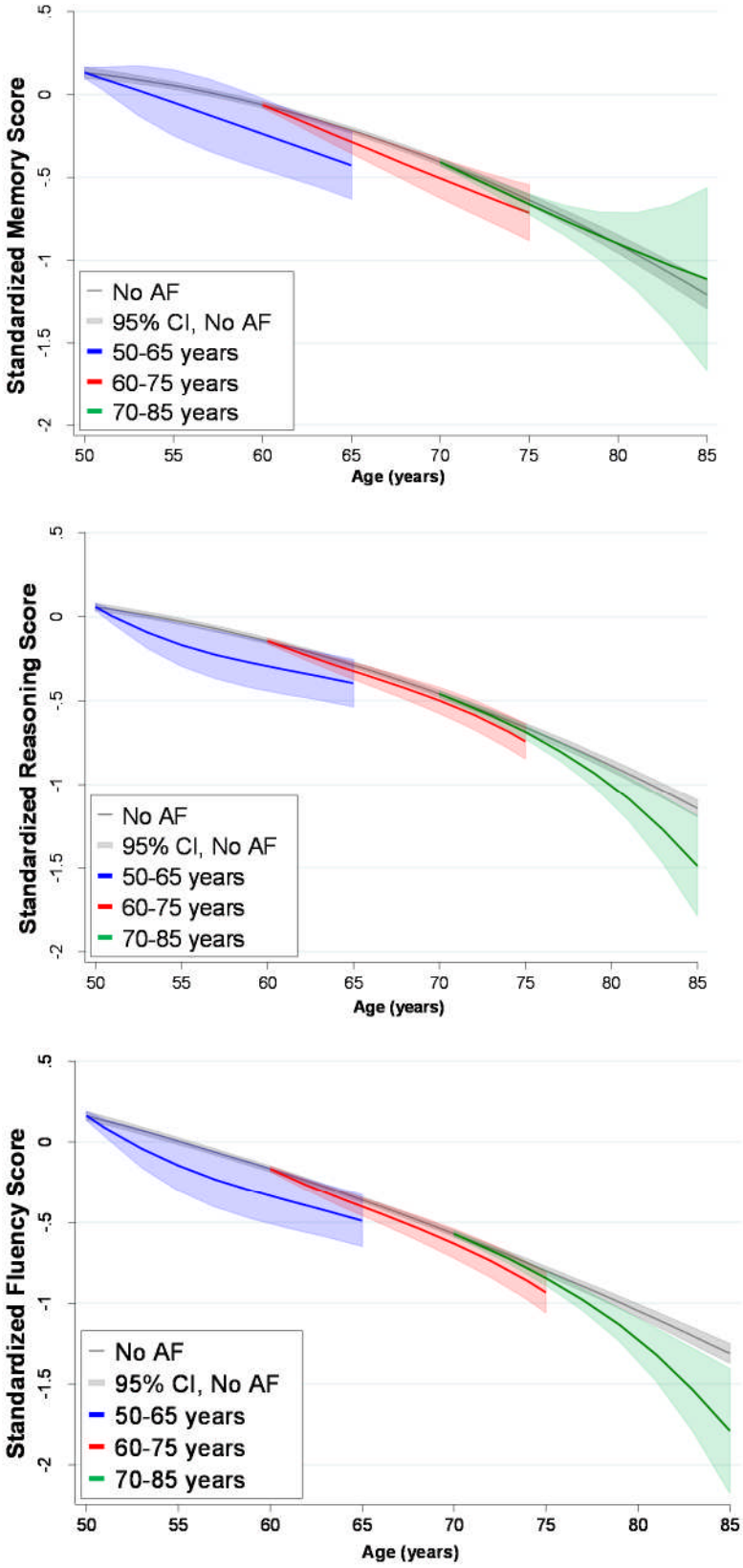


	Number of observations in the analysis				
Years	**-18 to -16**	**-16 to -12**	**-12 to-8**	**-8 to-4**	**-4 to 0**
Dementia free (N=7311)	5192	2489	3714	5938	4777
Dementia cases (N=195)	31	81	119	110	89

Supplementary Figure S2. Flow chart for analysis of cognitive decline and dementia.



Supplementary Figure S3. Decline in memory, reasoning and fluency as a function of atrial fibrillation (AF).



*Analysis uses age as the time-scale, adjusted for sex, education, and ethnicity.

Supplementary Table S1. Estimates of cognitive decline over 15 years[†] in those with atrial fibrillation (AF) compared to those without AF.

Analysis adjusted for sex, ethnicity and education (Model 1).

		Memory	Reasoning	Fluency
		beta (95% CI)	beta (95% CI)	beta (95% CI)
Mean (across all age-groups) 15 year Cognitive Decline				
	NO AF	**Ref.**	**Ref.**	**Ref.**
	additional decline: 5y after incident AF	-0.04 (-0.09, 0.01)	-0.03 (-0.07, -0.001)*	-0.05 (-0.09, -0.01)*
	additional decline: 10y after incident AF	-0.08 (-0.18, 0.02)	-0.07 (-0.14, -0.001)*	-0.10 (-0.18, -0.02)*
	additional decline: 15y after incident AF	-0.12 (-0.27, 0.03)	-0.10 (-0.21, -0.002)*	-0.15 (-0.27, -0.03)*
	P for trend	***0.11***	***0.045***	***0.01***
15 year Cognitive Decline as a function of age				
CURRENT AGE				
60 years	**Decline between 45-60 year, NO AF**	**-0.18 (-0.28, -0.08)***	***-0.25 (-0.30, -0.19)****	***-0.49 (-0.56, -0.42)****
	additional decline when AF at 45y	-0.26 (-0.59, 0.06)	-0.23 (-0.45, -0.01)*	-0.25 (-0.51, 0.01)
65 years	**Decline between 50-65 year, NO AF**	**-0.31 (-0.37, -0.24)***	***-0.33 (-0.36, -0.29)****	***-0.54 (-0.58, -0.49)****
	additional decline: incident AF at 50y	-0.21 (-0.42, -0.01)*	-0.11 (-0.25, 0.03)	-0.13 (-0.29, 0.03)
70 years	**Decline between 55-70 year, NO AF**	**-0.44 (-0.49, -0.39)***	***-0.41 (-0.44, -0.38)****	***-0.59 (-0.62, -0.55)****
	additional decline: incident AF at 55y	-0.15 (-0.33, 0.03)	-0.06 (-0.18, 0.06)	-0.09 (-0.23, 0.05)
75 years	**Decline between 60-75 years, NO AF**	**-0.56 (-0.64, -0.49)***	***-0.50 (-0.54, -0.45)****	***-0.63 (-0.69, -0.58)****
	additional decline: incident AF at 60y	-0.08 (-0.25, 0.10)	-0.08 (-0.19, 0.02)	-0.14 (-0.26, -0.01)*
80 years	**Decline between 65-80 years, NO AF**	**-0.69 (-0.80, -0.58)***	***-0.58 (-0.64, -0.52)****	***-0.68 (-0.76, -0.61)****
	additional decline: incident AF at 65y	0.004 (-0.27, 0.28)	-0.18 (-0.34, -0.02)*	-0.26 (-0.46, -0.07)*
85 years	**Decline between 70-85 years, NO AF**	**-0.82 (-0.97, -0.67)***	***-0.66 (-0.75, -0.58)****	***-0.73 (-0.84, -0.63)****
	additional decline: incident AF at 70y	0.09 (-0.47, 0.65)	-0.34 (-0.65, -0.04)*	-0.48 (-0.87, -0.09)*
Interaction between AF duration and age, p		***0.45***	***0.12***	***0.17***

*p<0.05

[†] Participants aged 45-69 years in 1997-1999 were followed until 2012-2013, mean follow-up 14.7 years. Estimates are for decline over 15 years. Analysis uses age as the time-scale; adjusted for sex, education, and ethnicity.

Supplementary Table S2. Estimates of decline in the global cognitive score over 15 years[†] in those with atrial fibrillation (AF) compared to those without AF.

Analysis adjusted for covariates at baseline and CVD over the follow-up (Model 5).

		Memory	Reasoning	Fluency
		beta (95% CI)	beta (95% CI)	beta (95% CI)
Mean (across all age-groups) 15 year Cognitive Decline				
	NO AF	**Ref.**	**Ref.**	**Ref.**
	additional decline: 5y after incident AF	-0.03 (-0.08, 0.02)	-0.02 (-0.06, 0.01)	-0.03 (-0.07, 0.01)
	additional decline: 10y after incident AF	-0.06 (-0.16, 0.05)	-0.04 (-0.11, 0.03)	-0.06 (-0.14, 0.02)
	additional decline: 15y after incident AF	-0.09 (-0.24, 0.07)	-0.06 (-0.17, 0.04)	-0.09 (-0.20, 0.03)
	P for trend	***0.28***	***0.24***	***0.16***
15 year Cognitive Decline as a function of age				
CURRENT AGE				
60 years	**Decline between 45-60 year, NO AF**	***-0.15 (-0.37, 0.06)***	***-0.28 (-0.40, -0.16)****	***-0.39 (-0.55, -0.24)****
	additional decline when AF at 45y	-0.22 (-0.54, 0.10)	-0.20 (-0.41, 0.02)	-0.22 (-0.48, 0.04)
65 years	**Decline between 50-65 year, NO AF**	***-0.31 (-0.45, -0.17)****	***-0.35 (-0.43, -0.27)****	***-0.48 (-0.58, -0.38)****
	additional decline: incident AF at 50y	-0.18 (-0.39, 0.03)	-0.08 (-0.23, 0.06)	-0.10 (-0.26, 0.06)
70 years	**Decline between 55-70 year, NO AF**	***-0.47 (-0.58, -0.36)****	***-0.42 (-0.49, -0.35)****	***-0.56 (-0.65, -0.48)****
	additional decline: incident AF at 55y	-0.12 (-0.30, 0.06)	-0.03 (-0.15, 0.09)	-0.05 (-0.18, 0.09)
75 years	**Decline between 60-75 years, NO AF**	***-0.63 (-0.78, -0.47)****	***-0.49 (-0.58, -0.39)****	***-0.65 (-0.76, -0.53)****
	additional decline: incident AF at 60y	-0.04 (-0.21,-0.14)	-0.04 (-0.15, 0.07)	-0.06 (-0.19, 0.07)
80 years	**Decline between 65-80 years, NO AF**	***-0.78 (-1.02, -0.55)****	***-0.56 (-0.69, -0.42)****	***-0.73 (-0.90, -0.56)****
	additional decline: incident AF at 65y	0.07 (-0.22, 0.36)	-0.11 (-0.27, 0.06)	-0.14 (-0.35, 0.06)
85 years	**Decline between 70-85 years, NO AF**	***-0.94 (-1.27, -0.61)****	***-0.62 (-0.81, -0.44)****	***-0.82 (-1.05, -0.58)****
	additional decline: incident AF at 70y	0.20 (-0.38, 0.79)	-0.23 (-0.54, 0.08)	-0.30 (-0.70, 0.11)
	Interaction between AF duration and age, p	***0.39***	***0.21***	***0.30***

*p<0.05

[†] Participants aged 45-69 years in 1997-1999 were followed until 2012-2013, mean follow-up 14.7 years. Estimates are for decline over 15 years. Analysis uses age as the time-scale; adjusted for sex, education, ethnicity, alcohol consumption, smoking, physical activity, diet, diabetes, hypertension, heart failure, CVD (stroke or CHD), CVD medication at baseline (1997-1999), and time-dependent CVD (1997-2013).