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**Supplemental References**

## **Supplemental Methods**

### **Description of cohorts**

#### **DanMONICA<sup>1</sup>**

The DanMONICA cohorts from the Research Center for Prevention and Health are three prospective population based cohorts from 11 municipalities from the western part of the suburbs of Copenhagen, Denmark. Random sampling was based on the national population register, stratified by sex and year of birth. Cohort 1 and 3 consists of men and women aged 30-70 years and cohort 2 consists of men and women aged 30-60. Cohort 1 was collected in 1982-1984 (N=4052). Cohort 2 (N=1504) was examined in 1986-1987 and cohort 3 (N=2026) was examined in 1991-1992. Follow-up was achieved through linkage to the National Cause of Death Register and National Hospital Discharge Register, with endpoint diagnosis based on MORGAM criteria and validation described in<sup>2</sup>. Follow-up for the cohorts 1, 2, and 3 was completed to December 31<sup>st</sup> 2010.

<http://www.thl.fi/publications/morgam/cohorts/full/denmark/den-gloa.htm>

#### **FINRISK<sup>3</sup>**

The FINRISK study is a series of population-based cardiovascular risk factor surveys carried out every five years in five (or six in 2002) districts of Finland, including North Karelia (in 1982-2002), Northern Savo (former Kuopio, in 1982-2002), Southwestern Finland (in 1982-2002), Oulu Province (in 1997-2002), Lapland province (in 2002) and the region of Helsinki and Vantaa (in 1992-2002). A stratified random sample was drawn for each survey from the national population register; the age-range was 25-64 years in 1982-1992 and 25-74 years in 1997-2002. All individuals enrolled in the study received a physical examination, a self-administered questionnaire, and a blood sample was drawn. In 1997, altogether 11500 individuals were invited and 8444 (73%) participated in the clinical examination. During follow-up the National Hospital Discharge Register, the National Causes of Death Register and the National Drug Reimbursement Register were used to identify endpoints. At the moment, the

follow-up extends until Dec. 31<sup>st</sup>, 2010, i.e., 9-29 years depending on the baseline year. The Ethics Committee of the National Public Health Institute and the Coordinating Ethics Committee of the Helsinki and Uusimaa Hospital District approved the study, which was in accordance with the declaration of Helsinki.

<http://www.thl.fi/publications/morgam/cohorts/full/finland/fin-fina.htm>

#### **Moli-sani<sup>4</sup>**

The cohort of the Moli-sani Project was recruited in the Molise region from city hall registries using multistage sampling. First, townships were sampled in major areas by cluster sampling; then, within each township, participants aged 35 years or over were selected by simple random sampling. Exclusion criteria were pregnancy at the time of recruitment, lack of understanding (e.g. language difficulties), current multiple trauma or coma, or refusal to sign the informed consent. A total of 24 325 men (47%) and women (53%) over the age of 35 were examined at baseline from 2005 to 2010. Participation was 70%. The cohort was followed-up for a median of 4.2 years (maximum 6.5 years) at December 2011. Follow-up is achieved through record linkage to national mortality registries and hospital discharge registers, validation of events was achieved through hospital record linkage and doctors medical records using updated MORGAM criteria.

<http://www.moli-sani.org/>

#### **Northern Sweden<sup>5</sup>**

The Northern Sweden MONICA (MONitoring Trends and Determinants in CARdiovascular Disease) cohort consists of randomly selected individuals aged 25–74 years from the counties of Västerbotten and Norrbotten who were invited to participate in this health study. The study began in 1986 and has been resampled six times with about 5-year intervals with new random samples of 2500 individuals each (the first two surveys invited 2000 individuals each). The overall participation rate was 74.7%, and a total of 10,457 unique persons participated through 31 December 2011. In 1999, participants from the previous surveys were invited for a repeated

survey. Follow-up is achieved through linkage to the MONICA stroke and MI registries and to the National Cause of Death Register and National Hospital Discharge Register, with endpoint diagnosis based on MONICA MORGAM criteria. Follow-up is completed until December 31<sup>st</sup> 2011. Details on the cohort are described at <http://www.jpi-dataproject.eu/Home/Database/359?topicId=1> and <http://www.org.umu.se/monica> (under construction)

## Supplemental Statistical Analyses

We present continuous variables as median (25th, 75th percentile) and binary variables as absolute and relative frequencies. Sex differences in baseline characteristics were tested using the Mann-Whitney test or the Chi-squared test. Missing data were dealt with available-case analyses, also known as pairwise deletion, meaning that for a given analysis (e.g. a regression), only those individuals without missing values on the variables involved in that particular computation were used. Prevalent AF cases were excluded from all analyses (N=687). The median follow-up (FU) was estimated using the reverse Kaplan-Meier estimator.<sup>6</sup> Cumulative incidence curves for AF and death without AF as competing risks were computed using the Aalen-Johansen estimator.<sup>7</sup> For these curves age was used as the time scale,<sup>8</sup> which involves dealing with left truncated survival data. To test for the equality of incidence curves between sexes for a specific endpoint the score test of Fine and Gray model for the endpoint in question with sex as the only covariate was used.<sup>9</sup> To examine the association of AF and all-cause mortality, a sex and cohort stratified Cox regression for all-cause mortality with AF during follow-up as a time dependent covariate was computed. Total cholesterol, BMI, daily smoking, diabetes, systolic blood pressure and antihypertensive medication were used as time fixed covariates as they are only available at baseline. For all these covariates and AF, a sex interaction was included in the model, to allow for the effect of the covariate to vary with sex. Age was used as the time scale.

To study the associations of AF risk factors with time to AF for women and men, sex and cohort stratified Cox regressions were performed. The use of stratification, that is allowing different baseline hazard functions for each combination of stratification variables, is a general method of adjustment. In particular, by adjusting for cohort we are accounting among others for the different baseline examination years across the cohorts. Age was used again as the time scale. First, for each risk factor a Cox model was computed. Then a model including simultaneously BMI, systolic blood pressure, total cholesterol, diabetes, daily smoking, and antihypertensive medication was fitted. Finally, each of the variables alcohol consumption, history of stroke,

history of myocardial infarction, C-reactive protein and Nt-proBNP was added in turn to this last model. For all covariates a sex interaction was included in each model to estimate a different hazard ratio (HR) for women and men. Wald 95% confidence intervals were computed for the hazard ratios. If a model included systolic blood pressure, then antihypertensive medication was also included in the model.

The proportional hazard assumption was examined graphically and with formal tests using the methods described in Grambsch & Therneau.<sup>10</sup> No evidence of violations of this assumption was observed. We calculated relative risk ratios (RRR) as the quotient (HR women)/(HR men). Since sex was coded in the models as 1 for men and 0 for women, for each risk factor the aforementioned HR quotient equals the exponentiated risk factor-sex interaction coefficient and Wald 95% confidence intervals was also used here.

We further calculated adjusted population attributable risks (PAR) for incident AF based on the following formula<sup>11,12</sup>:

$$PAR(t) = 1 - \frac{\sum_{i=1}^n P\{T_i^{AF} \leq \min(T_i^M, t) | X_i\}}{\sum_{i=1}^n P\{T_i^{AF} \leq \min(T_i^M, t) | X_i^*\}}$$

where

1.  $T_i^{AF}$  is the time to AF for individual i
2.  $T_i^M$  is the time to death for individual i
3.  $X_i$  are the covariate values for individual i
4.  $X_i^*$  are the target covariate values of individual i
5.  $P\{T_i^{AF} \leq \min(T_i^M, t) | X_i\}$  is the probability of developing AF before time t given the covariates  $X_i$  accounting for death as a competing event
6.  $P\{T_i^{AF} \leq \min(T_i^M, t) | X_i^*\}$  is the probability of developing AF before time t given the target covariates  $X_i^*$  accounting for death as a competing event

Using a competing risk approach separate cause-specific Cox models were computed for death (before AF) and AF. Probabilities of AF were obtained from these models using the Breslow estimate of the cumulative cause-specific baseline hazard function.<sup>13</sup>

For the PAR calculations we categorized the continuous variables BMI (<25 kg/m<sup>2</sup>, 25 to <30 kg/m<sup>2</sup>, ≥30kg/m<sup>2</sup>), systolic blood pressure (<120 mm Hg, 120 to <140 mm Hg, 140 to <160 mm Hg, ≥160 mm Hg), and total cholesterol (cut-off 200 mg/dL=5.17 mmol/L). Average daily alcohol consumption was categorized based on estimated pure alcohol intake as follows: category I: for women 0-19.99g pure alcohol daily, for men 0-39.99 g; category II: for women 20-39.99 g, for men 40-59.99 g; category III: for women ≥40 g, for men ≥60 g. These variables together with diabetes, daily smoking, history of myocardial infarction, history of MI and hypertension medication were used as covariates in the cause-specific Cox models. Age was used as the time scale and the models were stratified by sex and cohort. We used a 5-year period for the PAR. Confidence intervals were estimated using the bootstrap with 500 iterations.

In secondary analyses we evaluated the association of waist-to-hip ratio and the components of BMI, i.e. height and weight with time-to-AF using sex and cohort stratified Cox models with age as the time scale and including systolic blood pressure, total cholesterol, diabetes, daily smoking, and antihypertensive medication. For all covariates in the models a sex interaction term was included.

All statistical methods were implemented in R statistical software version 3.3.3 ([www.R-project.org](http://www.R-project.org)).

**Supplemental Table 1.** Baseline characteristics by cohort. Individuals with AF at baseline were excluded.

	All N=79,793	DanMONICA I N=4043	DanMONICA II N=1499	DanMONICA III N=2008	FINRISK 1982 N=9018	FINRISK 1987 N=5783	FINRISK 1992 N=5967	FINRISK 1997 N=8362
Examination age (years)	49.6 (39.7, 59.5)	50.5 (40.5, 60.6)	49.8 (39.8, 59.8)	50.0 (39.9, 60.1)	44.5 (34.5, 54.6)	45.2 (35.0, 54.7)	44.9 (35.3, 54.9)	48.5 (37.3, 59.5)
Male No. (%)	38567 (48.3)	2074 (51.3)	744 (49.6)	999 (49.8)	4456 (49.4)	2783 (48.1)	2807 (47.0)	4188 (50.1)
Survey year	1982-2010	1982-1985	1986-1987	1991-1992	1982	1987	1992	1997
BMI 25 to <30 kg/m <sup>2</sup> (%)	31482 (39.9)	1280 (31.7)	498 (33.3)	695 (34.6)	3548 (39.4)	2317 (40.1)	2283 (38.3)	3445 (41.2)
BMI ≥30kg/m <sup>2</sup> (%)	17392 (22.0)	386 (9.5)	135 (9.0)	253 (12.6)	1476 (16.4)	1091 (18.9)	1140 (19.1)	1707 (20.4)
Systolic blood pressure 120 to <140 mm Hg (%)	30717 (38.9)	1512 (37.4)	537 (35.9)	719 (35.8)	3443 (38.2)	2322 (40.2)	2541 (42.6)	3347 (40.1)
Systolic blood pressure 140 to <160 mm Hg (%)	20236 (25.6)	561 (13.9)	162 (10.8)	315 (15.7)	2821 (31.3)	1788 (30.9)	1497 (25.1)	2173 (26.0)
Systolic blood pressure ≥160 mm Hg (%)	10604 (13.4)	198 (4.9)	40 (2.7)	115 (5.7)	1595 (17.7)	880 (15.2)	727 (12.2)	1066 (12.8)
Diabetes No. (%)	3893 (4.9)	98 (2.4)	18 (1.2)	61 (3.0)	333 (3.7)	278 (4.8)	238 (4.0)	479 (5.7)
Daily smoking No. (%)	19474 (24.6)	1894 (46.8)	637 (42.5)	853 (42.5)	2379 (26.7)	1387 (24.1)	1509 (25.3)	1798 (21.9)
Antihypertensive medication No. (%)	12916 (17.0)	254 (6.6)	74 (5.0)	161 (8.3)	894 (10.3)	621 (11.1)	598 (10.1)	1108 (13.7)
Total cholesterol <5.17 mmol/L (%)	5.6 (4.9, 6.4)	1242 (30.8)	418 (27.9)	596 (29.9)	2202 (24.4)	1548 (26.8)	2256 (37.8)	3262 (39.3)
Average drinking category II (%)	4572 (5.9)	320 (7.9)	116 (7.7)	158 (8.0)	159 (1.8)	97 (1.7)	210 (3.5)	283 (3.7)
Average drinking category III (%)	2005 (2.6)	159 (3.9)	73 (4.9)	68 (3.4)	86 (1.0)	39 (0.7)	79 (1.3)	109 (1.4)
History of stroke No. (%)	1113 (1.4)	40 (1.0)	10 (0.7)	33 (1.6)	56 (0.6)	89 (1.5)	92 (1.5)	220 (2.6)
History of myocardial infarction No. (%)	2051 (2.6)	90 (2.2)	23 (1.5)	45 (2.2)	168 (1.9)	181 (3.1)	150 (2.5)	340 (4.1)
C-reactive protein (mg/L)	1.4 (0.7, 3.1)	1.2 (0.6, 2.8)	1.2 (0.5, 2.6)	1.2 (0.5, 2.6)	.	.	.	1.1 (0.6, 2.5)
Nt-proBNP (ng/mL)	49 (26, 91)	.	.	.	.	.	.	47 (25, 87)



(Continued)

	<b>FINRISK 2002 N=9195</b>	<b>MOLI-SANI N=23565</b>	<b>Northern Sweden 1986 N=1625</b>	<b>Northern Sweden 1990 N=1574</b>	<b>Northern Sweden 1994 N=1884</b>	<b>Northern Sweden 1999 N=1765</b>	<b>Northern Sweden 2004/2009 N=3505</b>
Examination age (years)	47.4 (36.4, 57.7)	54.4 (45.8, 64.2)	45.8 (36.4, 55.2)	45.1 (35.7, 54.8)	49.4 (37.3, 61.5)	50.7 (38.2, 62.2)	50.7 (38.4, 62.7)
Male No. (%)	4267 (46.4)	11162 (47.4)	823 (50.6)	772 (49.0)	923 (49.0)	859 (48.7)	1710 (48.8)
Survey year	2002	2005-2010	1986	1990	1994	1999	2004-2009
BMI 25 to <30 kg/m <sup>2</sup> (%)	3401 (40.1)	10022 (42.6)	579 (35.7)	601 (38.3)	755 (40.3)	771 (43.8)	1287 (37.0)
BMI ≥30kg/m <sup>2</sup> (%)	1785 (21.0)	7052 (29.9)	185 (11.4)	172 (11.0)	276 (14.7)	299 (17.0)	1435 (41.3)
Systolic blood pressure 120 to <140 mm Hg (%)	3473 (41.2)	8799 (37.3)	696 (42.8)	669 (42.5)	677 (36.0)	645 (36.5)	1337 (38.3)
Systolic blood pressure 140 to <160 mm Hg (%)	1995 (23.7)	7009 (29.8)	314 (19.3)	255 (16.2)	342 (18.2)	373 (21.1)	631 (18.1)
Systolic blood pressure ≥160 mm Hg (%)	974 (11.6)	4117 (17.5)	75 (4.6)	98 (6.2)	230 (12.2)	251 (14.2)	238 (6.8)
Diabetes No. (%)	481 (5.2)	1514 (6.5)	53 (3.3)	43 (2.7)	64 (3.4)	69 (3.9)	164 (4.7)
Daily smoking No. (%)	2300 (25.2)	4829 (20.7)	396 (24.5)	386 (24.5)	396 (21.1)	278 (15.8)	432 (12.4)
Antihypertensive medication No. (%)	1331 (18.4)	6586 (28.4)	142 (8.8)	124 (7.9)	203 (10.9)	236 (13.5)	164 (4.7)
Total cholesterol <5.17 mmol/L (%)	3140 (37.3)	9101 (38.9)	389 (23.9)	328 (21.0)	433 (23.1)	538 (30.6)	1276 (36.6)
Average drinking category II (%)	366 (4.0)	2846 (12.7)	1 (0.1)	1 (0.1)	3 (0.2)	3 (0.2)	9 (0.3)
Average drinking category III (%)	180 (2.0)	1207 (5.4)	0 (0)	0 (0)	0 (0)	3 (0.2)	2 (0.1)
History of stroke No. (%)	197 (2.1)	172 (0.7)	16 (1.0)	19 (1.2)	42 (2.2)	38 (2.2)	89 (2.5)
History of myocardial infarction No. (%)	248 (2.7)	469 (2.0)	65 (4.0)	23 (1.5)	59 (3.1)	68 (3.9)	122 (3.5)
C-reactive protein (mg/L)	.	1.6 (0.8, 3.3)	.	.	.	.	.
Nt-proBNP (ng/mL)	.	50 (26, 93)	.	.	.	.	.

Continuous variables are presented as median (25<sup>th</sup>, 75<sup>th</sup> percentile), with the exception of survey year where range is provided. Binary variables are presented as absolute and relative frequencies. Biomarkers were not available in all cohorts as indicated.

Average drinking categories based on pure alcohol intake: category II, for women 20-39.99 g, for men 40-59.99 g; category III, for women ≥40 g, for men ≥60 g. BMI stands for body mass index, Nt-proBNP for N-terminal pro B-type natriuretic peptide.

**Supplemental Table 2.** Survey year, age at baseline examination and follow-up information by cohort.

<b>Cohort</b>	<b>Baseline examination, year</b>	<b>Age range at baseline, years</b>	<b>Median follow-up atrial fibrillation, years</b>	<b>Maximum follow-up for atrial fibrillation, years</b>	<b>Number of atrial fibrillation cases during follow-up</b>	<b>Number of deaths</b>
DanMONICA I	1982-1985	30.5-71.1	27.4	28.2	377	1571
DanMONICA II	1986-1987	29.8-61.1	24.1	24.4	105	364
DanMONICA III	1991-1992	29.6-71.2	19.4	19.9	167	545
FINRISK 1982	1982	24.2-63.7	28.8	29	1026	2923
FINRISK 1987	1987	24.1-64.2	23.8	23.9	539	1247
FINRISK 1992	1992	24.1-64.2	18.9	19	342	733
FINRISK 1997	1997	24.2-74.3	13.8	13.9	479	1045
FINRISK 2002	2002	24.1-74.2	8.9	9	209	368
MOLI-SANI	2005-2010	34.6-97.6	4.3	6.8	414	544
Northern Sweden 1986	1986	25.2-65.2	25.9	26	156	405
Northern Sweden 1990	1990	24.1-64.1	21.8	22	107	235
Northern Sweden 1994	1994	24.1-74.2	17.9	18	155	347
Northern Sweden 1999	1999	24.1-74.3	12.8	13	107	182
Northern Sweden 2004/2009*	2004-2009	24.1-75.2	7.7	8	78	92

\*Due to the relatively low number of atrial fibrillation cases in the 2004 and 2009 Northern Sweden cohorts, these cohorts were combined for the analyses.

**Supplemental Table 3.** Multivariable-adjusted atrial fibrillation hazard ratios by sex and interaction P values for cholesterol lowering medication in the overall sample.

Variable	Interaction P value	Sex	Hazard Ratio (95% Confidence Interval)	P value	Relative Risk Ratio (95% Confidence Interval)
Cholesterol lowering medication	0.86	Women	1.11 (0.85, 1.44)	0.46	0.97 (0.69, 1.36)
		Men	1.14 (0.93, 1.40)	0.21	
Total cholesterol (mmol/L)	0.027	Women	0.85 (0.80, 0.90)	<0.001	0.91 (0.84, 0.99)
		Men	0.93 (0.88, 0.98)	0.0064	
Body mass index (kg/m <sup>2</sup> )	0.0082	Women	1.19 (1.12, 1.25)	<0.001	0.90 (0.83, 0.97)
		Men	1.32 (1.25, 1.41)	<0.001	
Systolic blood pressure (mm Hg)	0.43	Women	1.11 (1.05, 1.17)	0.018	0.97 (0.89, 1.05)
		Men	1.01 (1.00, 1.01)	<0.001	
Diabetes	0.56	Women	1.11 (0.90, 1.37)	0.34	1.09 (0.82, 1.44)
		Men	1.02 (0.85, 1.23)	0.84	
Daily smoking	0.89	Women	1.25 (1.04, 1.50)	0.017	0.98 (0.79, 1.23)
		Men	1.27 (1.13, 1.43)	<0.001	
Antihypertensive medication	0.011	Women	1.79 (1.56, 2.06)	<0.001	1.27 (1.06, 1.53)
		Men	1.41 (1.25, 1.60)	<0.001	

Hazard ratios for continuous variables are given per one standard deviation (SD) increase, total cholesterol: 1.14 mmol/L, body mass index: 4.7 kg/m<sup>2</sup>, systolic blood pressure: 21 mm Hg. Standard deviations were computed using all observations regardless of sex.

**Supplemental Table 4.** Age-adjusted hazard ratios by sex and interaction P values for AF risk factors in the overall sample.

Variable	Interaction P value	Sex	Hazard Ratio (95% Confidence Interval)	P value	N Atrial Fibrillation	Relative Risk Ratio (95% Confidence Interval)
BMI	0.004	Women	1.25 (1.20, 1.31)	<0.001	1790	0.91 (0.86, 0.97)
		Men	1.37 (1.31, 1.44)	<0.001	2462	
Systolic blood pressure	0.47	Women	1.09 (1.04, 1.15)	<0.001	1708	0.98 (0.91, 1.04)
		Men	1.12 (1.07, 1.17)	<0.001	2324	
Diabetes	0.17	Women	1.52 (1.28, 1.80)	<0.001	1794	1.17 (0.93, 1.47)
		Men	1.29 (1.11, 1.50)	<0.001	2463	
Daily smoking	0.41	Women	1.19 (1.03, 1.36)	0.015	1772	1.07 (0.91, 1.27)
		Men	1.11 (1.01, 1.21)	0.037	2422	
Antihypertensive medication	0.20	Women	1.86 (1.67, 2.07)	<0.001	1714	1.10 (0.95, 1.27)
		Men	1.69 (1.54, 1.87)	<0.001	2328	
Total cholesterol	0.008	Women	0.86 (0.82, 0.90)	<0.001	1782	0.92 (0.86, 0.98)
		Men	0.94 (0.90, 0.98)	0.005	2456	
Alcohol consumption	0.025	Women	1.05 (0.97, 1.12)	0.21	1743	0.91 (0.83, 0.99)
		Men	1.15 (1.10, 1.21)	<0.001	2340	
History of stroke	0.26	Women	1.80 (1.39, 2.34)	<0.001	1787	1.22 (0.87, 1.71)
		Men	1.48 (1.19, 1.84)	<0.001	2451	
History of myocardial infarction	0.67	Women	2.11 (1.71, 2.60)	<0.001	1786	1.05 (0.83, 1.35)
		Men	2.00 (1.76, 2.28)	<0.001	2450	
C-reactive protein	0.83	Women	1.18 (1.08, 1.28)	<0.001	532	0.99 (0.89, 1.10)
		Men	1.19 (1.11, 1.28)	<0.001	853	
Nt-proBNP	0.035	Women	2.32 (2.08, 2.60)	<0.001	277	1.16 (1.01, 1.33)
		Men	2.01 (1.87, 2.16)	<0.001	496	

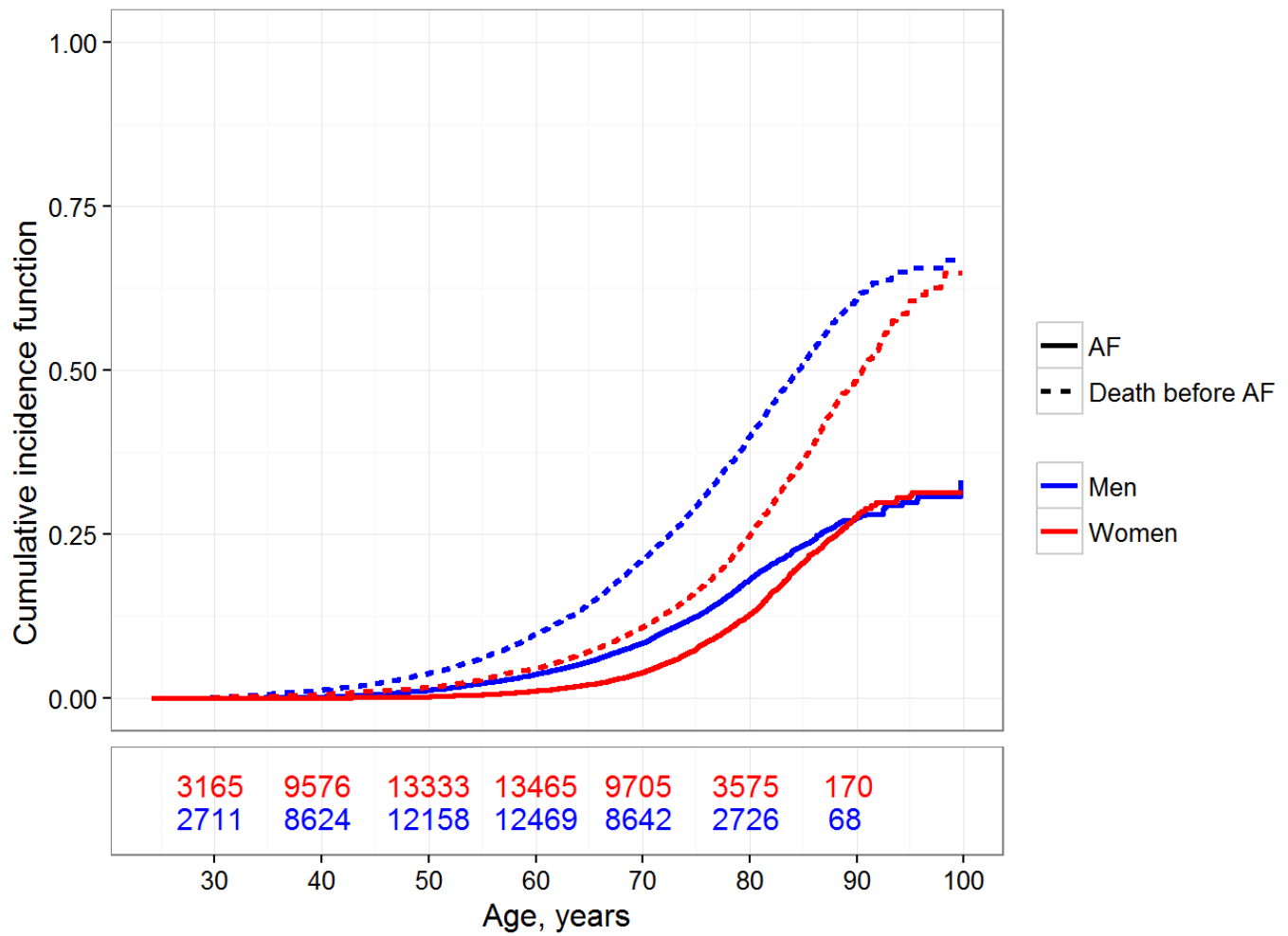
Hazard ratios for continuous variables are given per one standard deviation (SD) increase (BMI, systolic blood pressure, total cholesterol, C-reactive protein, and Nt-proBNP). SDs are for BMI: 4.69 kg/m<sup>2</sup>, systolic blood pressure: 21 mm Hg, total cholesterol: 1.18 mmol/L, log(C-reactive protein): 1.1, log(Nt-proBNP): 0.99, transformed alcohol consumption: 1.36. Standard deviations were computed using all observations regardless of sex. CRP, Nt-proBNP and alcohol consumption were log-transformed. Because abstainers from alcohol consumption can equal zero, one was added before applying the transformation. BMI stands for body mass index, Nt-proBNP for N-terminal pro B-type natriuretic peptide.

**Supplemental Table 5.** Multivariable-adjusted hazard ratios for incident atrial fibrillation by sex and interaction P values in the overall sample. An alternative base model is shown exchanging BMI by height and weight.

Variable	Interaction P value	Sex	Hazard Ratio (95% Confidence Interval)	P value	Relative Risk Ratio (95% Confidence Interval)
Height (cm)	<0.001	Women	1.41 (1.30, 1.54)	<0.001	1.23 (1.10, 1.37)
		Men	1.15 (1.07, 1.24)	<0.001	
Weight (kg)	0.11	Women	1.28 (1.20, 1.35)	<0.001	0.94 (0.87, 1.01)
		Men	1.36 (1.29, 1.43)	<0.001	
Systolic blood pressure (mm Hg)	0.95	Women	1.11 (1.05, 1.17)	<0.001	1.00 (0.94, 1.07)
		Men	1.11 (1.06, 1.16)	<0.001	
Diabetes	0.83	Women	1.13 (0.94, 1.36)	0.18	1.03 (0.81, 1.31)
		Men	1.10 (0.94, 1.29)	0.22	
Daily smoking	0.33	Women	1.35 (1.17, 1.55)	<0.001	1.09 (0.92, 1.29)
		Men	1.24 (1.12, 1.36)	<0.001	
Antihypertensive medication	0.11	Women	1.63 (1.46, 1.83)	<0.001	1.13 (0.97, 1.32)
		Men	1.44 (1.30, 1.60)	<0.001	
Total cholesterol (mmol/L)	0.021	Women	0.87 (0.83, 0.92)	<0.001	0.92 (0.87, 0.99)
		Men	0.94 (0.90, 0.99)	0.0099	

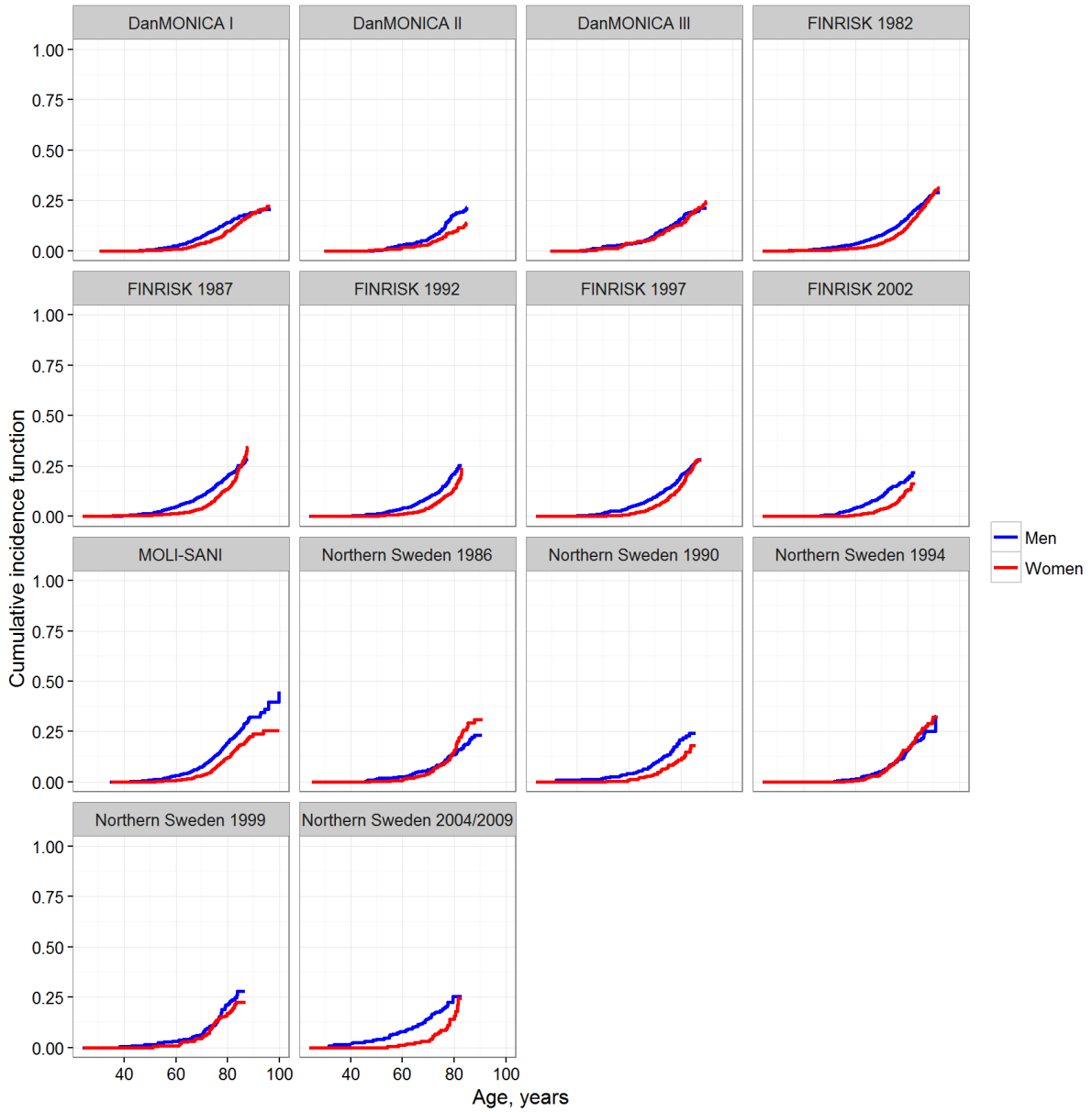
Hazard ratios for continuous variables are given per one standard deviation (SD) increase, height 9.81 cm, weight 14.7 kg, systolic blood pressure: 21 mm Hg, total cholesterol: 1.17 mmol/L. Standard deviations were computed using all observations regardless of sex.

Supplemental Figure 1.



Cumulative incidence functions for incident atrial fibrillation and death in women and men. The curves are derived from a competing risk approach via the Aalen-Johansen estimator. The numbers of individuals at risk are provided below. Testing for the equality of the cumulative incidence curves produces a P value <0.001 for each endpoint.

Supplemental Figure 2.



Cumulative incidence functions for incident atrial fibrillation by cohort. The curves are derived using death before atrial fibrillation as a competing risk via the Aalen-Johansen estimator.



## Reference List

1. Osler M, Linneberg A, Glumer C, Jorgensen T. The cohorts at the Research Centre for Prevention and Health, formerly 'The Glostrup Population Studies'. *Int J Epidemiol.* 2011;40:602-610.
2. Lynge E, Sandegaard JL, Rebolj M. The Danish National Patient Register. *Scand J Public Health.* 2011;39:30-33.
3. Borodulin K, Vartiainen E, Peltonen M, Jousilahti P, Juolevi A, Laatikainen T, Mannisto S, Salomaa V, Sundvall J, Puska P. Forty-year trends in cardiovascular risk factors in Finland. *Eur J Public Health.* 2015;25:539-546.
4. Di Castelnuovo A, De Curtis A, Costanzo S, Persichillo M, Olivieri M, Zito F, Donati MB, de GG, Iacoviello L. Association of D-dimer levels with all-cause mortality in a healthy adult population: findings from the MOLI-SANI study. *Haematologica.* 2013;98:1476-1480.
5. Hallmans G, Agren A, Johansson G, Johansson A, Stegmayr B, Jansson JH, Lindahl B, Rolandsson O, Soderberg S, Nilsson M, Johansson I, Weinehall L. Cardiovascular disease and diabetes in the Northern Sweden Health and Disease Study Cohort - evaluation of risk factors and their interactions. *Scand J Public Health Suppl.* 2003;61:18-24.
6. Schemper M, Smith TL. A note on quantifying follow-up in studies of failure time. *Control Clin Trials.* 1996;17:343-346.
7. Aalen OO, Johansen S. An empirical transition matrix for non-homogeneous Markov chains based on censored observations. *Scand J Statist.* 1978;5:141-150.
8. Korn EL, Graubard BI, Midthune D. Time-to-event analysis of longitudinal follow-up of a survey: choice of the time-scale. *Am J Epidemiol.* 1997;145:72-80.
9. Fine J.P., Gray RJ. A proportional hazards model for the subdistribution of a competing risk. *J Am Stat Assoc.* 1999;94.446:496-509.
10. Grambsch PM, Therneau TM. Proportional hazards tests and diagnostics based on weighted residuals. *Biometrika.* 1994;81:515-526.
11. Laaksonen MA, Virtala E, Knekt P, Oja H, Härkänen T. SAS macros for calculation of population attributable fraction in a cohort study design. *Journal of Statistical Software.* 2011;43:1-25.
12. Laaksonen M. Population attributable fraction in epidemiologic follow-up studies. Helsinki: National Institute for Health and Welfare; 2010. (PhD thesis)
13. Cheng SC, Fine JP, Wei LJ. Prediction of cumulative incidence function under the proportional hazards model. *Biometrics.* 1998;54:219-228.