Supplement to "Geriatric Syndromes and Atrial Fibrillation: Prevalence and Association with Anticoagulant use in a National Cohort of Older Americans"

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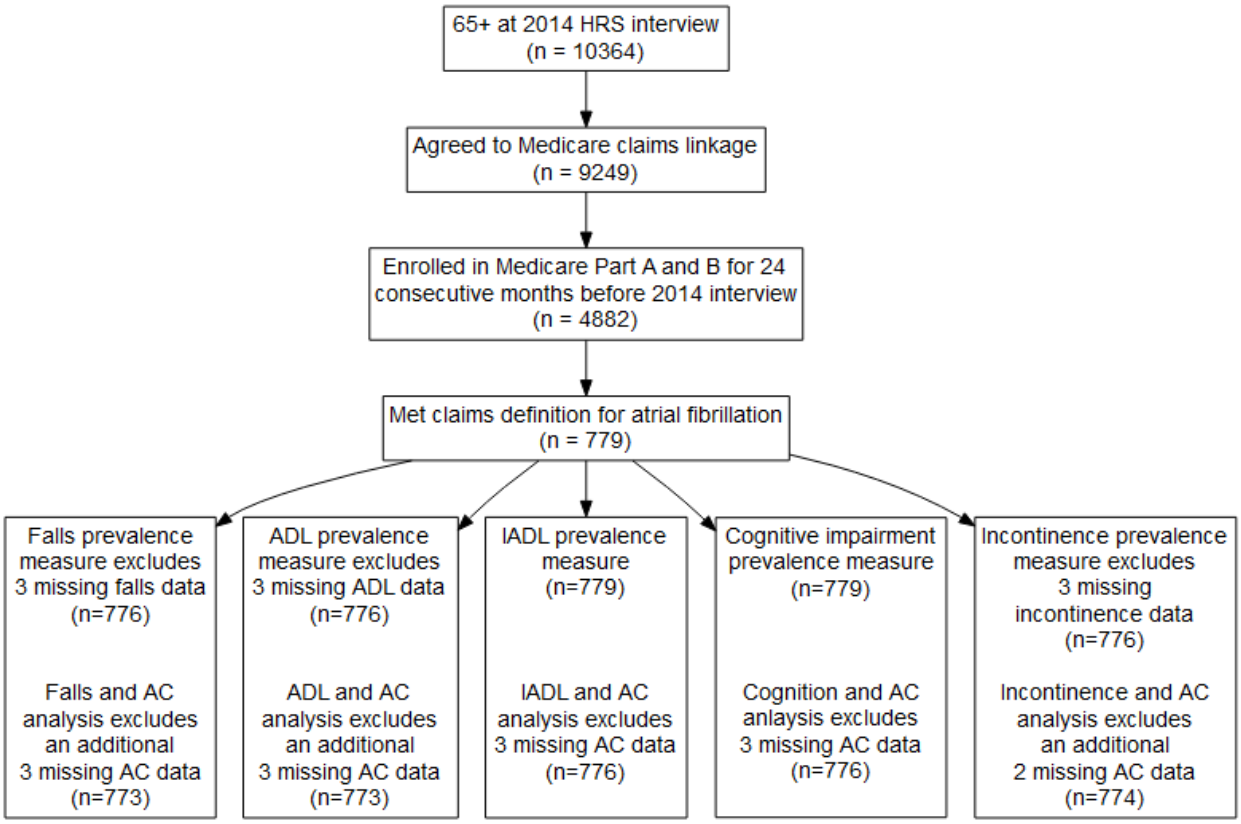
Contents

1. Supplemental Figure S1: Cohort flow diagram



Legend
HRS – Health and Retirement Study; AC – anticoagulation; ADL – activity of daily living; IADL – instrumental activity of daily living

2. Supplementary Table S2: Prevalence of individual activities of daily living, use of assistive devices, and instrumental activities of daily living in adults 65 years and older with atrial fibrillation in a nationally representative sample, 2014

	Prevalence (95% CI)
Bathing (ADL)	
No impairment	78% (75-82%)
Difficulty	4% (3-6%)
Dependence	17% (14-21%)
Getting out of bed (ADL)	
No impairment	85% (82-87%)
Difficulty	5% (4-7%)
Dependence	10% (8-13%)
Dressing (ADL)	
No impairment	76% (73-79%)
Difficulty	5% (4-7%)
Dependence	18% (15-22%)
Eating (ADL)	
No impairment	89% (86-92%)
Difficulty	3% (2-5%)
Dependence	8% (6-11%)
Toileting (ADL)	
No impairment	83% (80-86%)
Difficulty	9% (7-12%)
Dependence	7% (5-10%)
Walking (ADL)	
No impairment	79% (75-83%)
Difficulty	9% (7-11%)
Dependence	12% (9-16%)
Use of assistive devices in walking	42% (38-47%)
Grocery shopping (IADL)	
No impairment	74% (70-78%)
Difficulty	11% (9-15%)
Dependence	15% (12-18%)
Preparing meals (IADL)	
No impairment	73% (70-76%)
Difficulty	16% (13-20%)
Dependence	10% (8-13%)
Taking medications (IADL)	
No impairment	90% (88-93%)
Difficulty	4% (2-5%)

Dependence	6% (4-8%)
Managing money (IADL)	
No impairment	78% (75-82%)
Difficulty	6% (5-8%)
Dependence	15% (12-19%)
Using the phone (IADL)	
No impairment	86% (82-89%)
Difficulty	4% (2-5%)
Dependence	11% (8-14%)

3. Supplemental Table S3: Functional form of the association between the count of geriatric syndromes and anticoagulant use

We examined various functional forms to determine the association between the count of geriatric syndrome and anticoagulant use. First, we examined the relationship visually; based on visual inspection, the relationship appeared linear. Next, we determined the best fit by measuring the Bayesian information criterion (BIC) for each functional form (linear, exponential, logarithmic, and categorical). Below we present the BIC for each functional form. Continuous had the lowest BIC, indicating the best fit

Functional form	**BIC (lower is better)**
Linear	982.5
Exponential	987.1
Logarithmic	989.0
Categorical	1006.4

4. Supplemental Table S4: Count of geriatric syndromes and anticoagulant use, sensitivity analysis limiting population to those where guidelines recommend anticoagulant use

In this sensitivity analysis, we re-examine the association between the count of geriatric syndromes and anticoagulant use limiting the population to those where contemporary guidelines (i.e., 2014 AHA/ACC/HRS guidelines) recommend anticoagulant use.

Analysis	**Main manuscript** (population: all older adults with AF)	**Sensitivity analysis** (population: older adults AF who meet guideline recommendations for anticoagulant use)
Association between the count of geriatric syndromes and anticoagulant use (Figure 1)	-3.66% (95% CI -5.93 to -1.38%)	-3.73% (95% CI -6.01 to -1.44%)

5. Supplemental Table S5: Average marginal effect of individual geriatric syndromes on anticoagulant use adjusted for stroke risk, tabular format

The average marginal effect of individual geriatric syndromes on anticoagulant use adjusted for stroke risk

Syndrome	Level	Predicted anticoagulant use (95% confidence interval)	Difference from reference level (95% confidence interval)
Falls	No falls	0.68 (0.64 to 0.73)	Ref
Falls	Noninjurious falls	0.67 (0.61 to 0.73)	-0.017 (-0.093 to 0.060)
Falls	Injurious falls	0.62 (0.54 to 0.69)	-0.067 (-0.156 to 0.022)
ADL	ADL intact	0.70 (0.66 to 0.74)	Ref
ADL	ADL difficulty	0.61 (0.52 to 0.70)	-0.094 (-0.193 to 0.006)
ADL	ADL dependent	0.62 (0.55 to 0.68)	-0.084 (-0.162 to -0.006)
IADL	IADL intact	0.69 (0.65 to 0.74)	Ref
IADL	IADL difficulty	0.68 (0.59 to 0.76)	-0.016 (-0.112 to 0.079)
IADL	IADL dependent	0.60 (0.54 to 0.67)	-0.090 (-0.166 to -0.014)
Cognitive function	Cognitively intact	0.71 (0.67 to 0.75)	Ref
Cognitive function	Cognitive impairment, not dementia	0.63 (0.57 to 0.70)	-0.079 (-0.157 to -0.001)
Cognitive function	Dementia	0.51 (0.42 to 0.60)	-0.203 (-0.301 to -0.105)
Incontinence	Not incontinent	0.67 (0.63 to 0.72)	Ref
Incontinence	Incontinent	0.65 (0.60 to 0.70)	-0.023 (-0.091 to 0.045)

6. Supplemental Table S6: Individual geriatric syndromes and anticoagulant use, sensitivity analysis limiting population to those where guidelines recommend anticoagulant use

Syndrome	**Level**	**Difference from reference level from main manuscript** (population: all older adults with AF)	**Difference from reference level sensitivity analysis** (population: older adults AF who meet guideline recommendations for anticoagulant use)
ADL	ADL intact	Ref	Ref
ADL	ADL dependent	-8.4% (95% CI -16.2 to -0.6%)	-8.6% (95% CI -16.5 to -0.8%)
ADL	ADL difficulty	-9.4% (95% CI -19.3 to 0.6%)	-9.2% (95% CI -19.2 to 0.8%)
Cognitive function	Cognitively intact	Ref	Ref
Cognitive function	Cognitive impairment not dementia	-7.9% (95% CI -15.7 to -0.1%)	-7.9% (95% CI -15.7 to -0.1%)
Cognitive function	Dementia	-20.3% (95% CI -30.1 to -10.5%)	-20.6% (95% CI -30.5 to -10.7%)
Falls	No falls	Ref	Ref
Falls	Injurious falls	-6.7% (95% CI -15.6 to 2.2%)	-6.9% (95% CI -15.8 to 2.1%)
Falls	Noninjurious falls	-1.7% (95% CI -9.3 to 6%)	-1.3% (95% CI -9 to 6.5%)
IADL	IADL intact	Ref	Ref
IADL	IADL dependent	-9% (95% CI -16.6 to -1.4%)	-9.4% (95% CI -17 to -1.7%)
IADL	IADL difficulty	-1.6% (95% CI -11.2 to 7.9%)	-2.3% (95% CI -12 to 7.3%)
Incontinence	Not incontinent	Ref	Ref
Incontinence	Incontinent	-2.3% (95% CI -9.1 to 4.5%)	-2.7% (95% CI -9.5 to 4.1%)

7. Supplemental Table S7: Concordance of self-reported anticoagulant use and claims-based anticoagulant use: Sensitivity analysis on self-reported anticoagulant use

In this study, we used a self-reported measure of anticoagulant use ("Do you regularly take prescription medications other than aspirin to thin your blood or to prevent blood clots?"). We sought to examine if self-reported use of anticoagulants mirrored Medicare Part D claims for anticoagulants. To accomplish this, we examined a subset of HRS participants with atrial fibrillation and continuous enrollment in Medicare Part D for the 12 months preceding their 2014 interview (including the month of the interview), and who answered the question about anticoagulant use. In this subset (n=505 of 771 total), we examined the concordance between self-reported anticoagulant use and claims for oral anticoagulants, including warfarin, dabigatran, rivaroxaban, apixaban, and edoxaban. We found 83% concordance, and Kappa of 0.63, indicating substantial agreement between the two measures of anticoagulant use.

		Self-report		
		No AC	AC	Total
Claims	No AC	140 (27.7%)	62 (12.3%)	202 (40.0%)
	AC	26 (5.1%)	277 (54.9%)	303 (60.0%)
	Total	166 (32.9%)	339 (67.1%)	505 (100%)

* parenthetical percent is the percent of total population (n=505)

8. Supplemental Table S8: STROBE Statement—Checklist of items that should be included in reports of *cross-sectional studies*

	Item No	Recommendation	Reported on page
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4,5
Objectives	3	State specific objectives, including any prespecified hypotheses	5
Methods			
Study design	4	Present key elements of study design early in the paper	5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	5
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6-8
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	7,8
Bias	9	Describe any efforts to address potential sources of bias	8
Study size	10	Explain how the study size was arrived at	Appendix
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	8
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	8
		(*b*) Describe any methods used to examine subgroups and interactions	8
		(*c*) Explain how missing data were addressed	8, appendix
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	8

		(*e*) Describe any sensitivity analyses	8
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	Appendix
		(b) Give reasons for non-participation at each stage	Appendix
		(c) Consider use of a flow diagram	Appendix
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	8, 9, Table 1
		(b) Indicate number of participants with missing data for each variable of interest	8, 9, Table 1
Outcome data	15*	Report numbers of outcome events or summary measures	9, Table 2
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	8, 9, 10
		(*b*) Report category boundaries when continuous variables were categorized	n/a
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	9, Fig 1, Fig 2
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	Appendix
Discussion			
Key results	18	Summarise key results with reference to study objectives	10
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	11, 12
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	10, 11
Generalisability	21	Discuss the generalisability (external validity) of the study results	12
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	13

*Give information separately for exposed and unexposed groups.