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Factors that influence awareness and treatment of atrial fibrillation in older adults

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Summary

Aim: The aims of this study were to investigate the prevalence of atrial fibrillation (AF), treatment rates of AF and the factors underlying awareness and treatment, in a large nationally representative study.

Methods: A population sample of people aged 50+, living in the Republic of Ireland, were recruited as part of The Irish longitudinal study on ageing. Ten-minute electrocardiogram recordings were obtained ($n=4890$), and analysed to detect AF. Self-reported arrhythmias, subjective and objective health measures (cardiovascular diseases, CHA₂DS₂-VASc variables and blood pressure) and medications were also recorded. Logistic regressions were used to determine associations with outcomes of presence of AF, lack of awareness and untreated AF.

Results: Overall prevalence of AF was 3% (95% CI: 2.4–3.7%), with a marked age gradient and sex difference [4.8% (men) vs. 1.4% (women); $P<0.0001$]. In total, 67.8% were at high risk of

stroke (CHA₂DS₂-VASc ≥ 2), of whom 59.3% were inadequately treated. A high proportion of 38.1% were unaware of having AF. CHA₂DS₂-VASc nor HAS-BLED score influenced awareness or treatment. Lack of awareness was associated with lower education ($P=0.01$), lower cognition ($P=0.04$), rural location (OR=3.67; $P=0.02$) and number of general practitioner visits ($P=0.01$), whereas untreated AF was influenced by frailty status ($P=0.04$).

Conclusions: With projected doubling of numbers of persons over 80 in the next 30 years in the British Isles, detection and management of AF is pressing. Two-thirds of adults at high risk of stroke were inadequately treated. More regular screening for AF, application of criteria for stroke and bleeding risk and awareness of factors influencing diagnosis and treatment is recommended.

Introduction

Atrial fibrillation (AF) is the most common cardiac arrhythmia, directly affecting 1–2% in the general

population—predominantly older men.^{1–3} The prevalence of AF will continue to increase with a global demographic shift towards an older population. Almost one in four of all strokes is attributable to

AF,⁴ with the risk of death and cost of care increasing 1.5-fold in strokes associated with AF.

AF is readily diagnosed and treated in the community. Reduction of stroke risk associated with AF is effective; anti-coagulant therapy reduces the incidence of stroke by 64%.⁵ Several new emerging rhythm control and anti-coagulant medications eliminate issues associated with traditionally used therapies, such as the need for therapeutic monitoring. Technology-enhanced opportunistic screening is currently favoured as the most accurate and cost effective approach for AF detection.⁶ Although treatment is effective, recent evidence suggests that there is a distinct evidence-practice gap with many individuals failing to be diagnosed and/or receive treatment.⁷ Reports to date estimate anti-thrombotic treatment rates of between 39 and 62%, amongst AF patients eligible for anti-coagulation.^{8–11}

The causes of under treatment are unclear but reported factors include drug and dietary interactions, inconvenience of monitoring the international normalized ratio (INR), history of falls, co-morbidities such as dementia, concerns about real-world effectiveness, patient preference and under diagnosis in the community.^{12–14} AF is difficult to identify in certain cases, as it can be asymptomatic and/or intermittent. In Ireland, Hannon *et al.* reported that one-third of new stroke cases in North Dublin were associated with AF, which had not been previously diagnosed in 45%.¹³ The high prevalence of strokes attributed to AF is possibly due to low diagnosis rates of AF and inappropriate treatment.¹³ An understanding of the factors underlying awareness and treatment of AF will inform public awareness, health professional training and educational programmes and improve adherence to current management guidelines.

To date, studies reporting prevalence rates of AF in nationally representative populations, and patient awareness of AF coupled with information on treatments are few. Furthermore, there is a paucity of data examining the factors that influence patient awareness and treatment of AF. Most studies to date have employed the CHADS₂ score, which has minimal clinical utility when classic or modified cut-points are applied.¹⁵ Few studies have employed the newer CHA₂DS₂-VASc criteria,¹⁶ which has a higher stroke prediction performance.¹⁷

In this study, we describe the demographics of the Irish population with AF in a nationally representative sample. We identify the proportion unaware of a diagnosis of AF and inadequately treated according to the CHA₂DS₂-VASc score and a modified HAS-BLED¹¹ index. We further identify factors that account for both awareness and treatment of AF.

Methods

Study design

Data from the first wave of The Irish Longitudinal Study on Ageing (TILDA) were analysed. TILDA is a large prospective cohort study of ageing comprised of community dwelling people aged 50 and over resident in the Republic of Ireland. The objectives of TILDA are to describe the social (home care, social network), economic (income, employment) and health status (physical and mental health, medication use, health service utilization) of older adults and determine the factors underlying healthy ageing. Further detail of the study is published elsewhere.¹⁸

A statistically robust nationally representative sample was drawn from a listing of all residential addresses in the Republic of Ireland using the RANSAM sampling procedure.¹⁹ Each participant was representative of 142 members of the population aged ≥ 50 years. Data were collected by (i) computer-assisted personal interviewing (CAPI), (ii) a self-completion questionnaire and (iii) a physical health assessment. Ethical approval was obtained and all participants provided signed informed consent prior to the study. All experimental procedures adhered to the Declaration of Helsinki. Wave 1 data were collected between July 2009 and June 2011.

Covariate information

CAPI

Age, gender, highest educational attainment [primary (≤ 8 years), secondary (≤ 12 years) or tertiary (13+ years)], location (Dublin, other urban area or rural) and residential status were recorded. Participants were asked how many times they visited a general practitioner (GP) in the previous 12 months. History of health was obtained by asking if a doctor has ever told them they have diabetes, stroke, transient ischaemic attack (TIA) and cardiovascular disease (congestive heart failure, angina or myocardial infarction). In addition, specific awareness of having an arrhythmia was obtained by asking 'has a doctor ever told you, you have an abnormal heart rhythm?'. Behavioural health measures, including smoking history (current, past or never) and alcohol consumption (number of units) were also captured. Medication use was recorded and the interviewer logged the generic and proprietary names. The Anatomical Therapeutic Classification codes were subsequently recorded,²⁰ which allowed for categorization of medications and specific analysis of oral anti-coagulant (OAC) and oral anti-platelet (OAP) medication usage. Polypharmacy was defined as five or more medications.

Activities of daily living (ADL)²¹ and incremental activities of daily living (IADL)²² were measured by asking if participants had any difficulty carrying out normal daily activities, over a period of three or more months. Participants were asked how many times they visited a GP in the previous 12 months. They were asked what modes of transport they use and what their main mode of transport was. Current drivers (main or secondary mode of transport) were asked if they drive less than they did 5 years ago, and non-drivers were asked if they ever drove in the past. Participants answering yes were then asked if the change in driving has affected their ability to attend healthcare appointments over the last 12 months. Answers were categorized as 'never driven', 'no change to driving or never/rarely affects healthcare access' and 'affects access some/most/all of the time'.

The CHA₂DS₂-VASc score²³ was reconstructed for stroke risk stratification. A single point was allocated for age (65–74), female gender, objective evidence of hypertension and the self-reported presence of each of congestive heart failure, diabetes mellitus and vascular disease. Two points were allocated to participants who were aged ≥ 75 and to those with a previous stroke or TIA. As per European Society of Cardiology (ESC) guidelines, participants with a CHA₂DS₂-VASc score of >2 require OAC treatment, those with a CHA₂DS₂-VASc score of 1 require either OAC or OAP medications and those with a CHA₂DS₂-VASc score of zero require neither OAC nor OAP medication.

A modified HAS-BLED score was derived to inform possible bleeding risk. A single point was allocated for objective hypertension, abnormal renal function (history of renal cancer or diabetic nephropathy), abnormal liver function (cirrhosis, serious liver damage), history of stroke, age 65 or older, drug use (OAP or non-steroidal anti-inflammatory drugs) or alcohol abuse (>21 standard drinks weekly for males, >14 standard drinks weekly for females). Labile INR was not analysed, and history of bleeding was not recorded. Patients with a HAS-BLED score ≥ 3 are considered at high risk of bleeding, and caution and regular review following initiation of anti-thrombotic therapy is recommended.¹¹

Health assessment

Global cognitive function was assessed using the Montreal Cognitive Assessment (MoCA).²⁴ Body mass index (BMI) was calculated as the measured weight in kg divided by the square of measured height in m, and categorized as healthy (≤ 20), overweight (≤ 25) or obese (≤ 30). Mean systolic blood pressure (SBP) and diastolic blood pressure (DBP)

were measured from two recordings, using a sphygmomanometer on the upper arm in the seated position (mmHg). Hypertension was defined as either objective evidence of hypertension (SBP >140 mmHg and/or DBP >90 mmHg) or a positive response to the question 'Has a doctor ever told you that you have high blood pressure or hypertension'.

Frailty (score ≥ 1) and robust state (score = 0) were defined using the Fried frailty criteria.²⁵ A score of 1 assigned for each of the following: weight loss (unintended weight loss of 10 pounds or more), weakness (grip strength less than sex and BMI specific 20th percentiles for population over 65 years), exhaustion (positive response to: 'everything I did was an effort on more than one day' or 'I felt that everything I did was an effort'), slowness (timed-up-and-go less than sex and height specific 20th percentiles for population over 65 years) and low physical activity (International physical activity questionnaire minutes of activity less than sex specific 20th percentiles for population over 65 years).

Evaluation of AF

All subjects who underwent health assessment had a 10-minute surface electrocardiogram (ECG) recording (Medilog Darwin®). Subjects were directed to breathe normally, lying supine in a quiet room at ambient temperature (21–23°C). ECG signals were sampled at 4000 Hz, filtered between 0.01 and 100 Hz and stored digitally. Data records were scored for significant noise and artefact, and excluded if noise rendered clinician detection of AF impossible. ECG records were screened for AF independently by two clinicians according to ESC guidelines.²⁶ Inter-rater disagreement was resolved by a cardiologist, who made the final judgement. This provided gold standard objective evidence of AF prevalence. Consistency of inter-rater agreement was assessed on a subset of 300 ECG records, calculated as the Cronbach's alpha coefficient.

Statistical analysis

STATA 12 Intercooled (Stata Corporation, 2001, Texas) was used for analysis. All features were assessed for normality using data histograms, normal Q–Q plots and Kolmogorov–Smirnov test statistics. Normally distributed variables were compared using Student's *t*-tests. Non-parametric two-tailed Mann–Whitney *U*-test was used to compare non-parametric data. Significance was calculated at a level of $P < 0.05$. Adjustment was made for clustering of responses at household and geographical primary cluster level. Additional adjustments were made for potential bias in health centre attendance. Population weights were calculated by comparing

the TILDA sample with the national census population data, with respect to age, sex and educational attainment. They were applied when calculating the prevalence of AF and the characteristics of the AF and non-AF groups. Age, gender and education level were controlled for in initial regression modelling. Factors significant at the 95th percentile in Model 1 were further controlled for in Model 2, when analysing (i) the characteristics of AF, (ii) awareness of AF and (iii) treatment of AF. The census data and new weights (derived using age and gender specific population projections) were used to estimate current and predicted population burden of AF.

Results

Participants

In total, 8175 participants aged 50 years and older were recruited to the TILDA study, a response rate of 62%.¹⁸ Of these, 5036 had a comprehensive health

assessment, of whom 4890 (>95%) underwent ECG recording and were included in this study. Fifty-four per cent were men ($n=2647$, 95% CI: 53–56%), aged 63.8 (SD=9.8). The Cronbach's alpha coefficient between raters for AF was 0.996.

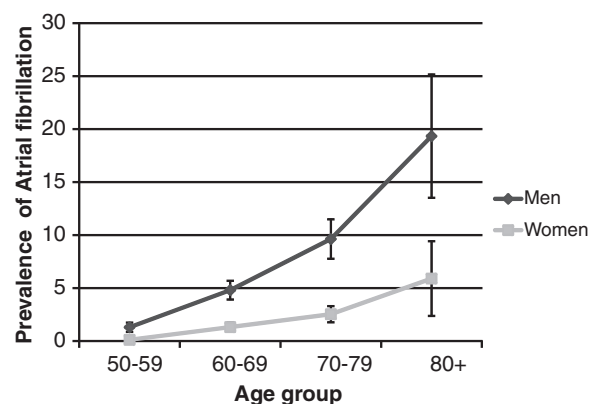


Figure 1. Weighted prevalence (with error bars) of AF by age and gender from the TILDA study ($n=4890$).

Table 1 Factors independently associated with AF when controlling for age, gender and education in multiple regressions, and controlling for significant risk factors (second regression)

Covariates	Total cohort					
	Model 1: multivariate analysis, adjusted for age, sex and education			Model 2: multivariate analysis, adjusted for significant factors		
	Odds ratio	95% CI	P-value	Odds ratio	95% CI	P-value
Age	1.11	1.09–1.13	<0.01	1.09	1.06–1.12	<0.01
Female sex	0.27	0.17–1.13	<0.01	0.36	0.22–1.12	<0.01
Education (ref = primary)						
Secondary	0.76	0.5–1.18	0.22	0.82	0.5–1.32	0.41
Tertiary	0.55	0.34–0.9	0.02	0.5	0.29–0.87	0.01
Living alone	0.99	0.62–1.6	0.98			
Location (ref = Dublin)						
Living in an urban area outside Dublin	1.13	0.69–1.85	0.62			
Living in rural area	1	0.64–1.58	0.99			
Alcohol units consumed weekly	1.02	1–1.03	<0.01	1.02	1–1.03	<0.01
Smoking status (ref = never smoked)						
Ex-smoker	1.79	1.2–2.7	<0.01	1.52	0.96–2.4	0.08
Current smoker	0.95	0.5–1.96	0.9	0.79	0.35–1.8	0.59
BMI (ref = healthy)						
Overweight	1.13	0.64–2	0.66			
Obese	1.68	0.96–2.95	0.07			
Hypertension	1.25	0.86–1.84	0.24			
Cardiovascular disease	2.4	1.3–3.2	<0.01	1.22	0.72–2.1	0.46
Stroke or TIA	2.18	1.1–4.2	0.02	1.9	0.92–3.9	0.08
Diabetes	1.37	0.8–2.4	0.27			
Polypharmacy	2.7	1.8–4	<0.01	2.47	1.55–3.92	<0.01
GP visits	1.03	1.01–1.05	<0.01	1.02	0.99–1.05	0.138

Values of $P \leq 0.05$ are indicated in bold.

Prevalence of AF

The overall prevalence of AF was 3% (95% CI: 2.4–3.7%) and higher in men than women (4.8%: 95% CI: 3.7–5.9% vs. 1.4%: 95% CI: 0.8–2.0%) both overall and with advancing age. There was a marked age gradient in both sexes (Figure 1): 19.3% of men and 5.9% of women aged 80 years and older had AF.

Demographic and clinical characteristics of individuals with AF

The demographic, health and social factors independently associated with AF, following adjustment

for age, sex and education (using multiple models) are summarized in Table 1. Higher age, male sex, primary education, higher alcohol intake, former smoking, history of cardiovascular disease, stroke or TIA, polypharmacy and higher number of GP visits were all significantly associated with AF. In Model 2, factors associated with AF from before were included. Here, higher age, male sex, primary education, higher alcohol intake and polypharmacy remained significant.

Awareness of AF

Of those with ECG evidence of AF, 38.1% ($n=45$) were unaware of an abnormal rhythm. Gender [40%

Table 2 Factors independently associated with lack of awareness of AF, when controlling for age, gender and education (first regression) and the significant risk factors from first regression (second regression)

Factors associated with lack of awareness (aware of AF $n=73$, unaware of AF $n=45$)						
Covariates	Model 1: multivariate analysis, adjusted for age, sex and education			Model 2: multivariate analysis, adjusted for significant factors		
	Odds ratio	95% CI	<i>P</i> -value	Odds ratio	95% CI	<i>P</i> -value
Age	0.98	0.94–1.03	0.47			
Female sex	0.77	0.3–1.97	0.58			
Education (ref=primary)						
Secondary	0.39	0.16–0.96	0.04	0.28	0.1–0.77	0.01
Tertiary	0.34	0.13–0.94	0.04	0.43	0.14–1.31	0.14
Living alone	1.07	0.4–2.8	0.9			
Location (ref=Dublin)						
Living in an urban area outside Dublin	2.7	0.89–8.13	0.08	2.32	0.76–7.1	0.14
Living in rural area	2.9	1.1–7.9	0.04	3.67	1.26–10.9	0.02
Alcohol units consumed weekly	0.97	0.94–1.02	0.29			
Smoking status (ref=never smoked)						
Ex-smoker	0.54	0.22–1.35	0.19			
Current smoker	1.17	0.26–5.3	0.84			
Polypharmacy	0.52	0.23–1.17	0.11			
GP visits	0.88	0.79–0.99	0.03	0.84	0.75–0.96	0.01
Main mode of transport=driving	1.8	0.7–4.67	0.22			
Healthcare access (ref=complete access)						
Non-drivers	0.69	0.19–2.57	0.58			
Impaired access to health care ($n=0$)	–	–	–			
CHA ₂ DS ₂ -VASc score (ref=0) ^a						
1	0.88	0.2–3.78	0.86			
≥2	0.54	0.15–2.03	0.36			
HAS-BLED score (ref=0) ^b						
≥3	1.06	0.08–13.07	0.96			
MoCA score	0.87	0.77–0.99	0.03	0.86	0.75–0.96	0.03
Frailty status (ref=robust)						
Frail	0.55	0.24–0.93	0.15			
Have an ADL and/or IADL disability	0.74	0.24–2.21	0.59			

Values of $P \leq 0.05$ are indicated in bold.

^aCHA₂DS₂-VASc modelled omitting age and sex due to collinearity.

^bHAS-BLED modelled omitting age due to collinearity.

($n=36$) men vs. 32.1% ($n=9$) women; $P=0.455$] and age ($P=0.469$) did not influence awareness.

Factors independently associated with lack of awareness, following adjustment for age, sex and education (using multiple models), are reported in Table 2. Subjects with lower education, living rurally, lower cognition and lower number of GP visits were less likely to be aware. Each of these factors remained statistically significant following analysis together in a single model (Model 2).

Stroke risk and treatment AF

Those with AF were stratified by stroke risk according to the CHA₂DS₂-VAsC score: 67.8% ($n=81$) had a CHA₂DS₂-VAsC score ≥ 2 , a further 22% ($n=26$) had a score of 1 and the remaining 10.2% ($n=11$) had a score of zero (Figure 2).

40.7% ($n=33$) of the CHA₂DS₂-VAsC ≥ 2 group were on OAC therapy, a further 34.6% ($n=28$) were

on OAP therapy only and the remaining 24.7% ($n=20$) were not taking any anti-thrombotic medication. Of those not on OAC in this group, 4.2% ($n=2$) had a HAS-BLED score of 3 or more.

In the CHA₂DS₂-VAsC=1 group, 23% ($n=6$) were taking OAC therapy, a further 38.5% ($n=10$) were on OAP alone and the remaining 38.5% ($n=10$) in this group were not taking any anti-thrombotic treatment. Of those not on OAC in this group, none had a HAS-BLED score of 3 or more.

In the CHA₂DS₂-VAsC=0 group, 36% ($n=4$) were taking OAC therapy, 36% ($n=4$) were taking OAP therapy alone and the remaining 28% ($n=3$) were not taking any anti-thrombotic treatment.

Factors associated with treatment

Independent factors for untreated AF (not on OAC therapy) are summarized in Table 3. Frailty status was the only factor significantly associated with

Table 3 Factors independently associated with untreated AF (not on OAC therapy), when controlling for age, gender and education (first regression) and the significant risk factors from first regression (second regression)

Factors associated with untreated AF (untreated $n=75$, treated $n=43$)

Covariates	Model 1: multivariate analysis, adjusted for age, sex and education		
	Odds ratio	95% CI	P-value
Age	0.98	0.93–1.03	0.47
Female sex	0.9	0.37–2.2	0.82
Education (ref=primary)			
Secondary	0.72	0.3–1.75	0.47
Tertiary	0.79	0.3–2.1	0.64
Living alone	0.78	0.3–2.07	0.62
Location (ref=Dublin)			
Living in an urban area outside Dublin	1.74	0.57–5.35	0.33
Living in rural area	0.47	0.19–1.19	0.11
Polypharmacy ^a	0.63	0.29–1.37	0.25
GP visits	0.98	0.92–1.03	0.4
Main mode of transport=driving	0.51	0.2–1.32	0.17
Healthcare access (ref=complete access)			
Non-drivers	1.1	0.3–4	0.88
Impaired access to health care	1.13	0.1–19.3	0.93
CHA ₂ DS ₂ -VAsC score (ref=0) ^b			
1	1.9	0.4–8.63	0.43
≥ 2	0.8	0.21–2.96	0.74
HAS-BLED score (ref=0) ^c			
≥ 3	1.28	0.1–15.61	0.85
MoCA score	0.95	0.84–1.07	0.42
Frailty status (ref=robust)			
Frail	0.43	0.19–0.96	0.04
Have an ADL and/or IADL disability	2.17	0.7–6.78	0.18

Values of $P \leq 0.05$ are indicated in bold.

^aPolypharmacy excluding OAC medications.

^bCHA₂DS₂-VAsC modelled omitting age and sex due to collinearity.

^cHAS-BLED modelled omitting age due to collinearity.

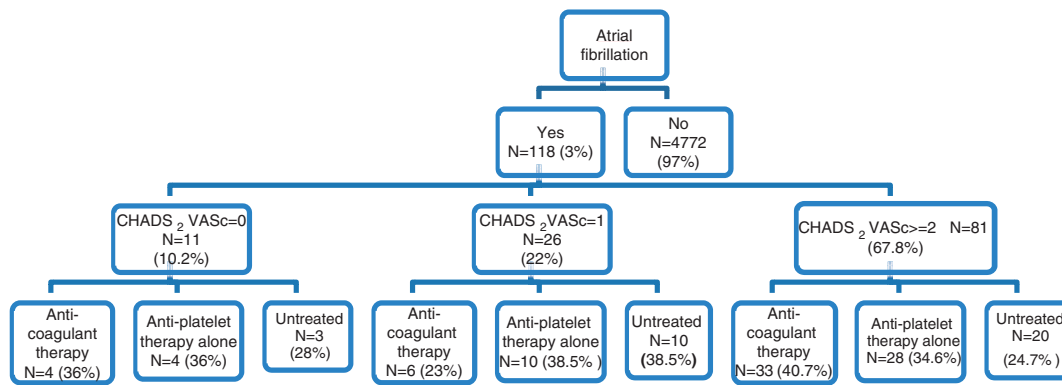


Figure 2. Comparison of treatment patterns by stroke risk according to the CHA₂DS₂-VASc score.

treatment, whereby frail subjects were more likely to be treated. CHA₂DS₂-VASc and HAS-BLED scores, location, number of GP visits and access to health-care facilities did not predict treatment.

Discussion

The prevalence of AF rises dramatically with age. It is evident in one in five men aged 80 years and over. Although 7 of 10 adults with AF had a high risk of stroke, less than half were on appropriate treatment as evidenced by current guidelines. Conversely, over one-third of those at low risk of stroke were inappropriately treated with oral anti-coagulants. Frailty was the only factor to influence treatment. Awareness of AF was also worryingly low; less than half were aware of their diagnosis, suggesting poor screening for AF. Frequency of attendance to practitioners was associated with awareness but not treatment. Lower cognitive function, lower education and rural dwelling were all associated with lack of awareness.

These findings have implications for the inadequacy of self-reported arrhythmias in determination of prevalence of AF; and the poor application of current guidelines for treatment of AF and stroke prevention. Marked differences in self-reported and objective measures emphasize the importance of employing standardized objective measures when applying cross country comparisons in Europe, where self-reporting of diseases in community datasets is employed to inform policy (Eurostat).²⁷ Population characteristics of those unaware and inappropriately treated will inform public health policy initiatives including public awareness, professional education and training programmes, and screening programmes.

Using population data from the Irish national census, we estimate that of 34 771 (95% CI: 27 166–42 375) people with AF, 16 502 eligible

patients are not treated. Using national population projections, AF will increase 3-fold to 107 000 by 2040 (with a corresponding prevalence increase from 3 to 4.5%), mainly due to dramatic age related demographic changes—particularly the oldest old (age 80+). This striking increase in the older population is a worldwide phenomenon. The proportion of people over 50 years in the UK will rise by 37% during the same period, and the proportion over 80 years will rise from 4.6 to 7.7%.²⁷ If our data are extrapolated to the UK—the total number of UK adults with AF will rise from 800 000 to 1.4 million over the next 30 years. Accurate phenotyping of this at risk population is necessary for policy initiatives aimed at improving AF diagnosis and management. This will consequently lead to effective reductions in stroke,⁵ disability¹³ and dementia,²⁸ all of which are sequelae of AF, each carrying a significant healthcare burden.

Although lack of awareness of AF has been reported previously,^{7,29} these new data further describe the factors that underscore lack of awareness, namely lower cognitive function, lower education, less GP visits and rural dwelling. This will help inform public policy when developing screening programmes, with focus on targeting older adults with these characteristics. An education campaign is also warranted to increase rates of awareness and consequently detection of AF in the community. Screening tools to facilitate AF detection in the community have recently been developed,³⁰ and may offer a means of screening larger numbers of people without relying on impractical ECG recording for accurate detection. The rationale for including these factors in regressions was based on characteristics which may logically influence awareness or treatment, namely demographics, health behaviours, disability, current guidelines and access and use of healthcare services.

Treatment rates are low (40.7%) in adults at high cardioembolic risk, reflecting earlier studies that

report suboptimal adherence to both CHADS₂^{8–10} and CHA₂DS₂-VASc criteria.¹⁴ Unlike the TILDA study, most of these other studies precede intensive British and American media coverage and professional programmes for correct AF management. Of note, CHA₂DS₂-VASc score did not influence treatment. This mirrors results reported by the REGARDS study⁷ and provides further objective evidence to support the assertion of an evidence practice gap. A modified HAS-BLED bleeding risk score was constructed and applied to the CHA₂DS₂-VASc ≥ 2 group who were untreated with OAC. Only 4.2% had a HAS-BLED score of ≥ 3 , suggesting that established contraindications or cautionary factors did not explain the low treatment rate. History of falls, and co-morbid conditions, including dementia are factors associated with avoidance of treatment.^{14,31} A novel finding of this study was that Fried's frailty index was a significant factor accounting for OAC treatment, whereby frailer subjects were more likely to be anti-coagulated. This may indicate the complexity of decision-making criteria used by physicians beyond established CHA₂DS₂-VASc risk factors. They may perceive frailer patients to have a greater stroke risk, hence requiring treatment. A previous study of inpatients with AF reported frailer subjects were less likely to receive OAC therapy, in spite of having an increased risk of stroke.³² Further investigation of the impact of frailty on both prescribing and effectiveness of anti-coagulation is warranted. The reluctance of physicians to prescribe anti-coagulants has recently been reported as the commonest cause of undertreatment.³³ Our findings provide new and important information on the treatment decisions made by physicians. The apprehension to prescribing anti-thrombotics may be eased in the near future, in light of the recent licensing of newer OACs, as the need for therapeutic monitoring is eliminated.

Thirty-six per cent of those at low stroke risk were on OAC therapy. However, other unrecorded indications may account for OAC treatment in this group. Compared with CHADS₂ guidelines, CHA₂DS₂-VASc demonstrates improved accuracy for identification of 'truly low risk' patients, and this must be utilized by physicians before considering initiating treatment.¹⁴ A number of factors that may influence awareness were not recorded in this study. ECG recording during GP visits was not documented. Clinician preference not to treat may have influenced their decision to inform the patient of their arrhythmia, however, when CHA₂DS₂-VASc standards were applied, this was inconsistent with guideline recommendations. Patients may also have declined treatment offered to them. However,

comprehensive assessment of demographics, life-style characteristics, healthcare utilization and disability is a novel feature here. This study was designed to detect AF present during a 10-minute ECG recording; thus persistent, permanent or paroxysmal AF fortuitously detected during this interval were screened for. The presence of paroxysmal AF on a 10-minute recording is highly unlikely, indicating that persistent and permanent AF likely accounted for most cases detected. Approximately, 5% of the population over 64 years are living in residential care in Ireland.³⁴ Given the high prevalence of stroke, disability and dementia in residential care facilities, the current reported prevalence is likely an underestimate. Exclusion of persons in residential care and/or with significant cognitive impairment/dementia from TILDA ensured the accuracy of self-reported measures. However, this also means that findings reported here cannot be generalized to describe the entire population. TILDA is a longitudinal study, and so those who enter institutional care will be followed up in subsequent waves.

In summary, awareness of AF in Ireland is worryingly low and treatment according to the CHA₂DS₂-VASc score is inadequate. The ageing demographic is expected to accelerate in the coming years, and improved public awareness, care, professional education and training are needed in response, for adequate AF management.

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