Project Number: 847770

Project Acronym: AFFECT-EU

DIGITAL, RISK-BASED SCREENING FOR ATRIAL FIBRILLATION IN THE EUROPEAN COMMUNITY

Deliverable D1.1

An overview of ongoing and completed AF screening studies

(Month 9)

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Project

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Deliverable 1.1

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1.1	16.09.2020	▪ Document adjusted after 1st round of feedback.
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1.3	24.09.2020	▪ Revised and reviewed the document for final adjustments before submission.

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Abbreviation

Abbreviation	Name
AF	Atrial Fibrillation
CIED	Cardiac implantable electronic device (e.g. pace-maker, implantable cardiac defibrillator)
ECG	Electrocardiography
f/u	Follow-up
GP	General Practice
OAC	Oral Antiocoagulation
pts	Patients
yrs	Years
wk	Week

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Executive Summary

Deliverable (D) 1.1 systematically identified available biomedical AF screening study sources and reviewed the literature for Atrial Fibrillation (AF) screening studies to contemporarily characterize the data for the research proposed in the AFFECT-EU Consortium. The purpose of the systematic review was to provide an overview of AF screening studies to generate information about what types of data should be included in the study variable catalogue that will be created in D1.2.

AF Screening studies have been conducted in several countries for more than 30 years. New knowledge within the field combined with technological advancements has resulted in a high diversity. Based on the AFFECT-EU consortium plan [1], 14 parameters have been included in the D1.1 list:

1) Author/Study
2) Year of completion
3) Country
4) Number of study participants or screenees
5) Recruitment description
6) Inclusion Criteria
7) Exclusion Criteria
8) Geographic location and year of study
9) Screening Device
10) Screening & f/u duration
11) Recruiting Segment
12) Study Approach
13) End Point
14) Results

The complete table contains 55 studies or study groups, 10 of which are beneficiaries of the AFFECT-EU consortium. Links to where the data for each study was acquired is attached to the first column,

"Author/Study". Some studies have been published in peer-reviewed scientific journals, while others are only registered in clinical trial databases such as clinicaltrials.gov. The former is to be preferred since publications contain information about study results – something that is rarely found in trial registries.

1. Review Methodology

Approach

5 databases of published and grey literature were searched using a pre-specified search strategy. The following sources were used: PubMed, Web of Science, Researchgate.net, clinicaltrials.gov, Google Scholar.

Additional references were located by hand searching, by screening the references of included studies, and by contacting specialists in the subject area of the review.

The selection criteria are as follows

- Primary end-point is AF prevalence; general prevalence or new-AF
- Screening method must include some type of ECG recording
- The ECG is not analysed in retrospect

Main results

A comprehensive literature review of AF screening studies by Khurshid et al. [2] was recently (June 2020) published in the journal of Circulation Research, and therefore many of the included studies in the resulting D1.1-table were cited by that publication. Furthermore, two additional literature reviews were used to further ensure that all relevant studies are included; 1) A literature review by Lowress et al. [3] (2013) and a large systematic review on AF screening studies by Welton et al. [4] (2017). Also, a search was performed to identify studies published since the review by Khurshid as well as including any missing AFFECT-EU studies.

2. List of AF Screening Studies – AFFECT-EU studies

Author/Study	Year of completion	Country	Number of study participants or screenees	Recruitment description	Inclusion Criteria	Exclusion Criteria	Geographic location and year of study	Screening Device	Screening & f/u Duration	Recruiting Segment	Study Approach	End Point	Results
STROKESTOP II [5]	Ongoing	Sweden	Screened: 6868 Control: 14356	All 75-76 yrs old in the Stockholm region, were randomized 1:1 to an AF screening programme or control group.	75-76 yrs old, lives within the region of Stockholm		Stockholm Region, Sweden, from Apr. 2016 and is ongoing	Zenicor single-lead ECG	Twice daily for 14 days	Limited to inhabitants within specific community	Systematic	New-onset AF, initiation of OAC	Total prevalence of AF: 10.5%, New AF: 2.6%
D2AF [6]	Ongoing	Netherlands	Target: 19200 N to date: 9218	Asked eligible patients to participate if they had an appointment for a consultation at the practice during the study year	Aged ≥65 yrs, where a fixed sample of 200 is selected from each GP	Any history of AF, having a CIAD, suffering from a terminal illness or unable to come to the practice	96 clusters of 200 patients GPs in Netherlands, from Sep. 2015 to August 2018	MyDiagnostick single-lead ECG, WatchBP oscillometric device	Single time-point	The country's general population	Opportunistic	New-onset AF	
LOOP [7]	Estimated to 2021	Denmark	Screened (n = 1500) Control (n = 4500)	Identified by administrative registries, invited by letter. Patients included in the study are randomized 1:3	Aged ≥70 yrs, with one or more of hypertension/diabetes/ heart failure/previous stroke	Any history of AF	Copenhagen, Denmark, from Jan. 2014 and is ongoing	Implantable Loop Recorder	Continuous during ≥ 3 years	The country's general population	Systematic	New-onset AF, Stroke or systemic embolism	
SAFER [8]	Estimated to 2027	United Kingdom	126000	Eligible patients identified and invited by GP practice	≥70 yrs	On long-term anticoagulation; on the palliative care register; resident in a nursing / care / residential home	12 GP practices in Eastern England, from Feb. 2019 and is ongoing	Handheld single-lead ECG	21-day intermittent (4x ECG traces per day)	The country's general population	Systematic	New-onset AF, stroke	
AFRICAT 1 [9]	2019	Spain	100	Subjects fulfilling inclusion criteria were identified from primary care registries and invited to participate in the study	65-75 yrs, hypertension and diabetes	Chronic inflammatory diseases, cancer, dementia	Spain, from May 2016 to Apr. 2017	First: Fibricheck, MyDiagnostick and WatchBP), Second: Holter ECG.	First: Single time-point second: 4 wks continuous	The country's general population	Systematic	New-onset AF	Total prevalence of AF: 20% New AF: 11%
AFRICAT 2 [10]	Estimated to 2020	Spain	400	Subjects fulfilling inclusion criteria were identified from primary care registries and invited to participate in the study	65-75 yrs, hypertension and diabetes	Previous history of AF, chronic inflammatory diseases, cancer, dementia	Spain, from May 2016 to Apr. 2017	First: Fibricheck, MyDiagnostick and WatchBP), Second: Holter ECG.	First: Single time-point second: 4 wks continuous	The country's general population	Systematic	New-onset AF	
AF-STROKE [11]	2018	Germany	7606	All persons aged ≥65 years who entered a pharmacy during the enrolment period were invited to participate in the study	All pharmacy customers aged ≥65 years	Not able to understand the purpose of the study, acute health problem	90 pharmacies in the Aachen area, Germany, Jan. 2017 to Aug. 2018	Single-lead ECG	Single time-point	The country's general population	Opportunistic	New-onset AF	

Author/Study	Year of completion	Country	Number of study participants or screenees	Recruitment description	Inclusion Criteria	Exclusion Criteria	Geographic location and year of study	Screening Device	Screening & f/u Duration	Recruiting Segment	Study Approach	End Point	Results
RITMO-OK	Estimated to 2021	Italy	5000	Persons attending the hospital for requesting information to admitted pts, or attending social events or educational initiatives on preventive care	≥50 yrs, history of hypertension, diabetes or heart disease	History of AF	Different locations or events around Italy	Single-lead ECG	Single time-point	The country's general population	Opportunistic		
Irish Opportunistic Screening Study [12]	Estimated to 2021	Ireland	7262	All persons aged ≥65 years, attending GP surgeries for routine consultation over a 6-month period in 2014.	≥65 yrs, attending GP surgeries for routine consultation over a 6-month period in 2014.		45 General practices in 3 counties in Ireland	Screening with digital palpation on the radial artery. If an irregular pulse was found a 12 lead ECG was conducted.	Single time point	The country's general population	Opportunistic	New-onset AF, stroke, heart failure, death cardiovascular events	Total prevalence of AF: 10.86%. New AF: 0.76%
STROKESTOP I [13]	2019	Sweden	7173	All 75-76 yrs old in two Swedish regions were invited (n = 13331), where 53.8% participated (n = 7173)	75-76 yrs old, lives in one of two Swedish regions		Community based; 2 Swedish regions, from Mar. 2012 to Jun. 2014	Zenicor single-lead ECG	Twice daily for 14 days	The country's general population	Systematic	New-onset AF, initiation of OAC	Total prevalence of AF: 12.3%. New AF: 3.0%

3. List of AF Screening Studies – Literature

Author/Study	Year of completion	Country	Number of study participants or screenees	Recruitment description	Inclusion Criteria	Exclusion Criteria	Geographic location and year of study	Screening Device	Screening & f/u Duration	Recruiting Segment	Study Approach	End Point	Results
Wheeldon et al. [14]	1998	United Kingdom	1422	Patients were identified from a computerised patient database for a 12-lead ECG. Patients with AF where invited to take an echocardiography	≥65 yrs		A single GP, UK	12-lead ECG, if AF also echocardiography	Single time-point	The country's general population	Systematic	Prevalence of AF, new anticoagulation treatment	5.4% prevalence of AF, 21,4% receiving warfarin
Engdahl et al. [15]	2013	Sweden	848	All individuals of Halmstad, Sweden, born in 1934 and 1935 were invited to participate by mail.	75-76 yrs		Halmstad, Sweden	First: 12-lead ECG Second: single-lead handheld ECG	First: Single time-point Second: Twice daily for 14 d	The country's general population	Systematic	Prevalence of AF, New AF	Total prevalence of AF: 14.3% New AF: 7%
SEARCH-AF [16]	2014	Austria	1000	Opportunistic in pharmacies.	≥65 yrs	Severe coexisting medical condition preventing participation (e.g. severe dementia or terminal illness)	Sydney, Australia from Jun. 2012 to Jan. 2013	Pulse palpation and a handheld iPhone-based lead-IECG (iECG) using the AliveCor Heart Monitor	Single time-point	Limited to inhabitants within specific community	Opportunistic	Prevalence of AF and new-onset AF	Total prevalence of AF: 6.7% New AF: 1.5%
Kearly et al. [17]	2014	United Kingdom	1000	Identified from GP records were invited to participate until reaching the sample size	≥75 yrs	Having a CIAD, those unable to give informed consent, or patients in whom the general practitioner (GP) considered participation was inappropriate (eg, terminal illness)	6 GPs in UK, from May 2011 to Oct. 2012	Single-lead ECG, blood pressure monitor	Single time-point	The country's general population	Opportunistic	AF detection, new cases of AF	Total prevalence of AF: 7.9% New AF: 1.2%
Kaasenbrood et al. [18]	2016	Netherlands	3269	Recruited eligible participants through GPs in 2013	≥60 yrs		10 GPs within Groningen, Netherlands, during 2013	Single-lead ECG	Single time-point	Limited to inhabitants within specific community	Opportunistic	AF detection, new cases of AF	Total prevalence of AF: 3.7% New AF: 1.1%
Chan et al. [19]	2016	Hong Kong	1013	Patients with hypertension, diabetes mellitus and/or aged ≥65 yrs were recruited	hypertension, diabetes mellitus and/or aged ≥65	Having a CIAD	Chai Wan General Out-patient Clinic, Hong Kong, from May to Jun. 2015	Single-lead handheld ECG and PPG, confirmation by 12-lead ECG	Single time-point	Limited to inhabitants within specific community	Opportunistic	AF detection	Total prevalence of AF: 2.76% New AF: 0.5%
PIAAF-Pharmacy Study [20]	2016	Canada	1145	Recruited individuals ≥65 yrs through community pharmacies	≥65 yrs	Unable to provide consent, or known AF and under OAC therapy	Pharmacies in Alberta and Ontario, from Oct. 2014 to Apr. 2015	Single-lead ECG	Single time-point	Limited to inhabitants within specific community	Opportunistic	Actionable' AF: Unrecognised or undertreated AF	Total prevalence of New AF: 2.5%, OAC treatment started on 17%

Author/Study	Year of completion	Country	Number of study participants or screenees	Recruitment description	Inclusion Criteria	Exclusion Criteria	Geographic location and year of study	Screening Device	Screening & f/u Duration	Recruiting Segment	Study Approach	End Point	Results
Chan et al. [21]	2016	Hong Kong	5969	Recruited through a single clinic in Hongkong if they had a history of hypertension, diabetes mellitus or ≥65 yrs.	≥18 yrs with history of hypertension and/or diabetes mellitus (or ≥65 yrs)	Having a CIAD	Primary healthcare setting in Hong Kong, from Sept. 2014 to Jan 2015	Single-lead handheld ECG and PPG, confirmation by 12-lead ECG	Single time-point	Limited to inhabitants within specific community	Opportunistic	AF detection	Total prevalence of AF: 1.21
Quinn et al. [22]	2018	Canada	2171	Patients ≥65 who attended routine appointments	≥65 yrs	Patients being unavailable for follow-up; having a CIAD; inability to have a blood pressure cuff or electrocardiogram electrodes applied	Family practice clinics in Alberta, Canada, from 2015 to 2016	Single-lead handheld ECG, PPG or palpation, confirmation by 12-lead ECG	Single time-point	Limited to inhabitants within specific community	Opportunistic	AF detection, anticoagulation initiation	Total prevalence of New AF: 0.7%, OAC treatment started on 77%
Apple Heart Study [23]	2019	United Kingdom	419297	Interested individuals who download and open the Apple HeartStudy App and meet inclusion criteria are invited to participate in the study.	≥22 yrs, possession of a compatible Apple iPhone and Apple Watch	Previous atrial fibrillation or current use of oral anticoagulation agents were not eligible.	iPhone users within USA, from Nov. 2017 to Jan 2019	PPG-based smart watch followed by ECG patch in subset	Single time-point	The country's general population	Systematic	AF identification after smartwatch-based irregular pulse	0.52% participants received an irregular pulse notification. From these, 34% had atrial fibrillation on subsequent ECG patch readings and 84% of notifications were concordant with atrial fibrillation.
Huawei Heart Study [24]	2019	China	187912	Subjects who freely download the app in the HUAWEI Appstore	≥18 yrs, HUAWEI smart device(s) and phone	Inability to use smart phone or devices.	Huawei users within China, from Oct 2018 to May 2019	PPG-based smart watch or band followed by 12-lead ECG subset	Single time-point	The country's general population	Systematic	Suspected AF and confirmed AF	"Suspected AF": 0.23%, 87.0% of which were confirmed as having AF
Morgan and Mant [25]	2002	United Kingdom	Systematic (N = 1499) Opportunistic (N = 1502)	Randomly selected patients from patients on GP lists in study age range	Between 75 and 100 yrs of age		5 GPs within the MRC network (UK)	Systematic: Pulse assessment and lead II rhythm strip, 6 months Opportunistic: Clinical Pulse assessment with discretionary 12-lead ECG if abnormal	Systematic: 6 months Opportunistic: Single time-point	The country's general population	Systematic & Opportunistic	Compare the uptake and effectiveness of two methods of screening for atrial fibrillation in general practice	AF prevalence: systematic: 4.5% (all), 0.8% new Opportunistic: 1.3 (all), 0.5% new
SAFE [26]	2007	United Kingdom	Systematic (N = 4933) Opportunistic (N = 4933) No Screening (N = 4936)	50 general practices from the Midlands Research Practices Consortium (MidReC). All patients aged 65 or over from these practices were eligible	≥65 yrs	GP advice	50 general practices in UK, from Oct. 2001 to Feb. 2003	Systematic: Pulse assessment and 12-lead ECG, single time-point Opportunistic: Pulse assessment and 12-lead ECG if abnormal	Single time-point	The country's general population	Systematic & Opportunistic	New-onset AF	AF prevalence: No screening: 1.04% Systematic screening: 1.62%. Oppotunistic:1.64%
REHEARSE-AF [27]	2017	United Kingdom	Standard Care (N = 501) Intervention (N = 500)	Recruited through GP records or during attendance at a GP	≥65 yrs, CHAD-VASc score ≥2	On AOC, AF diagnosis or current cardiac pacing implantation	United Kingdom	Screening: Single-lead handheld ECG	Twice weekly for 12 months	The country's general population	Systematic	AF diagnosis, serious events	AF prevalence: Intervention: 3.8% Standard care: 1%

Author/Study	Year of completion	Country	Number of study participants or screenees	Recruitment description	Inclusion Criteria	Exclusion Criteria	Geographic location and year of study	Screening Device	Screening & f/u Duration	Recruiting Segment	Study Approach	End Point	Results
mSToPS [28]	2018	United States	Systematic screening (N = 1366) Opportunistic (N = 1293)	Recruited through the Aetna Fully Insured Commercial and Medicare Advantage populations.	≥75 yrs, ≥55 yrs (male with 1 AF/stroke risk factor), ≥65 yrs (female with 1 AF/stroke risk factor	Current or prior diagnosis of AF, atrial flutter or atrial tachycardia, on AOC; or having a CIAD	USA, from Nov. 2015 to Jan. 2018	Immediate screening: Single-lead patch monitor (unscreened period) Delayed screening: Single-lead patch monitor (unscreened period)	Continuous for up to 14 days	The country's general population	Systematic & Opportunistic	New-onset AF	AF prevalence: Immediate: 3.9% Delayed: 0.9%
Heartline [29]	Ongoing	United States	Estimated to reach 150.000	Recruited by downloading a custom-made iPhone app. Randomized into two groups; One uses Heartline study app alone and the other uses it together with an Apple Watch	≥65 yrs, US resident, iPhone 6 or later, Original (Traditional) Medicare, Parts A and B		iPhone user within USA, planned to start in Feb 2020	Apple Watch ECG	Continuous for study duration (TBA)	The country's general population	Opportunistic	AF detection, New-onset AF	
SCREEN-AF [30]	2020	Canada	856	Eligible participants were recruited from primary care practices and randomly allocated (1:1) to one of two groups	≥75 yrs	previous AF or atrial flutter (≥30 seconds), implanted cardiac device, poorly compliant, o AOC	Primary Care centres in Canada, from Apr 2015 to Oct. 2019	Zio patch monitor, WatchBP oscillometric device	2 wk at baseline and at 3-month mark	The country's general population	Systematic	New-onset AF	
AF-CATCH [31]	Ongoing	China	7641	Recruited through one of five community health centres in the city of Shanghai.	≥65	AF at baseline, on AOC, serious life-threatening disease, difficult for long-term follow-up visit	Five community health canters in Shanghai, China, Apr 2017 to Sept. 2017	AliveCor single-lead ECG, if unreadable signal; 12-lead ECG	Single time-point, f/u at 12-month mark only questionnaire	The country's general population	Opportunistic	New-onset AF	
MonDAFIS [32]	Ongoing	Germany	3470	Patients were enrolled through about 30 German-certified stroke units and randomized 1:1 into one of two groups; normal ECG for AF detection or an additional 7-day Holter ECG	≥18, acute ischemic stroke or transit ischemic attack, admission within 72 hours, ECG monitoring within 24 hours	Known AF or AF detection before study start	30 stroke units in Germany from Dec. 2014 and is ongoing	G1: 12-lead ECG, G2: 12-lead ECG & 7-days Holter ECG	G1: Single time-point, G2: Also Continuous for up to 7 days	The country's general population	Systematic	New-onset AF, initiation of OAC	
VITAL-AF [33]	Ongoing	United States	35000	Patients were recruited while visiting a primary care office and randomly selected for the AF spot-check	≥65		16 primary care at MGH, Boston metro area, MA, USA, from July 2018 to Oct. 2019	AliveCor single-lead ECG, at each encounter	Single time-point	Limited to inhabitants within specific community	Opportunistic	New-onset AF	
GUARD-AF [34]	Ongoing	United States	52000	Participants are recruited through 192 primary care offices in the USA.	≥70	Any history of AF, on OAC, having a CIAD	192 primary care offices in USA, from Dec. 2019 and is ongoing	Zio patch monitor	Continuous for 2 wk	The country's general population	Systematic	New-onset AF, stroke, major bleeding	

Author/Study	Year of completion	Country	Number of study participants or screenees	Recruitment description	Inclusion Criteria	Exclusion Criteria	Geographic location and year of study	Screening Device	Screening & f/u Duration	Recruiting Segment	Study Approach	End Point	Results
London Pharmacy Study [35]	2018	United Kingdom	604	Study advertised by poster and leaflet within the participating practices via text message and via verbal contact at the practice during the influenza vaccination clinics.	≥65 years	Having a CIAD, coexisting medical condition (e.g., terminal illness), insufficient cognitive capacity (e.g., severe dementia) to provide informed consent	4 GPs in Kent, United Kingdom, from Oct. 2017 to Jan. 2018	Pulse palpitation, AliveCor single-lead ECG	Single time-point	The country's general population	Opportunistic	New-onset AF, test accuracy of screening modalities	Total prevalence of AF: 4.3%, new-onset AF: 0.7%
Fitbit Heart Study [36]	Ongoing	United States	100000	Fitbit invites every resident of the US to participate in their study by signing a letter of consent, allowing their Fitbit data to be collected by the study.	≥22 yrs, US resident, owns a Fitbit device capable of tracking Heart Rate.		Fitbit user within USA, from May 2020 and is ongoing	Wrist-based PPG, wearable PPG-based algorithm followed by ECG patch	Continuous for as the study runs (TBA)	The country's general population	Systematic	New-onset AF	
Sanmartin et al. [37]	2013	Spain	1532	Letters containing informative materials and an invitation to attend a special nurse appointment were sent to all individuals ≥ 65 yrs old, without a previous diagnosis of atrial fibrillation or flutter of 3 specific areas in Pontevedra province.	≥65 yrs	Known atrial fibrillation or atrial flutter	Pontevedra province, Spain	Pulse palpitation, 12-lead ECG performed if detected arrhythmic pulsations	Single time-point	Limited to inhabitants within specific community	Systematic	New-onset AF	Total prevalence of New AF: 1.1%
OFRECE study [38]	2014	Spain	8343	Participants >40 yrs and from Spain assigned to PC physician, based in their home province.	≥40 yrs		46 provinces in Spain, from Mar. 2010 to Oct. 2012	12-lead ECG	Single time-point	The country's general population	Systematic	Prevalence of AF	Total prevalence of AF: 4.4%
Gill et al. [39]	2009	UK	5354	Participants from Bermingham and of Indian, Pakistanian and Bangladesh descend, ≥45 yrs old, invited to participate through 20 primary care centres.	≥54 yrs, South Asian and Black African - Caribbean groups	If GP considered them unable to participate, terminal illness, dementia, etc.	20 Primary Care units in Bermingham, UK, from Sept. 2006 to Jul. 2009	12 lead ECG and random sample from 3 independent cardiologist	Single time-point	The country's general population	Systematic	Prevalence of AF	Total prevalence of AF: 1%
Sudlow et al. [40]	1998	England	916	916 age and sex stratified subjects were recruited using 9 contiguous GPs in southern Northumberland	≥65 yrs		9 GPs in southern Northumberland, England.	12-lead ECG and pulse palpitation	Single time-point	The country's general population	Systematic	Prevalence of AF	Total prevalence of AF: 4.5%

Author/Study	Year of completion	Country	Number of study participants or screenees	Recruitment description	Inclusion Criteria	Exclusion Criteria	Geographic location and year of study	Screening Device	Screening & f/u Duration	Recruiting Segment	Study Approach	End Point	Results
Hill et al. [41]	1987	England	819	All symptomless patients over the age of 65 years on 1 December 1983 were identified from the age-sex register of a large general practice in Tamworth, Staffordshire and were invited by post to the study	>65 yrs		A single GP in Tamworth Staffordshire, England, identified in 1987	12-lead ECG	Single time-point	Limited to inhabitants within specific community	Systematic	Prevalence of AF, new-onset AF	Total prevalence of AF: 3.7%; New AF: 1.2%
Camm et al. [42]	1980	England	106	A group general practice in Sussex, England, provided a list of all their patients 75 years of age and older, who were invited to participate	≥75 yrs		A group of GPs in Sussex, England, identified in 1980.	12-lead ECG	Single time-point	Limited to inhabitants within specific community	Systematic	Prevalence of AF	Total prevalence of AF: 9%
Claes et al. [43]	2012	Belgium	10758	69 Belgian medical centres invited participants to be screened during June 2010.	≥40 yrs		69 medical centres, Belgium, June 2010	Handheld single-lead ECG	Single time-point	The country's general population	Systematic	Prevalence of AF, new-onset AF	Total prevalence of AF: 2.1%; New AF: 1.5%
Schnabel et al. [44]	2012	Germany	5000	Participants are selected at random via the registration office in Mainz	35-75 yrs		Mainz, Germany, from Jan. 2007 to Dec. 2012	12-lead ECG	Single time-point	The country's general population	Systematic	Prevalence of AF, new-onset AF	Total prevalence of AF: 1.3%; New AF: 0.5%
REGARDS study [45]	2010	USA	29861	Participants recruited from a commercially available list of residents using mail and telephone	≥45 yrs		Commercial list in USA, from Jan. 2003 to Dec. 2010	12-lead or 7-lead ECG	Single time-point	The country's general population	Systematic	Prevalence of AF, new-onset AF	Total prevalence of AF: 1.5%; New AF: 0.6%
Doliwa et al. [46]	2009	Sweden	606	During the 2005 annual congress of the European Society of Cardiology in Stockholm a public event was organized where the general public was invited to perform an ECG	≥18 yrs		Event in Stockholm, Sweden, during 2005	Handheld single-lead ECG	Single time-point	Limited to inhabitants within specific community	Opportunistic	Prevalence of AF, new-onset AF	Total prevalence of AF: 2%; New AF: 1%
(Associated to) The Rotterdam study [47]	2006	Netherlands	6808	Inhabitants of the area of Rotterdam was invited to participate during 1990	>55 yrs		Rotterdam, Netherlands, during 1990	12-lead ECG	Single time-point	The country's general population	Systematic	Prevalence of AF	Total prevalence of AF: 3%
Lavenson et al. [48]	2004	USA	2559	Screening is announced in the newspaper, and seniors call for an appointment	>60 yrs		Newspaper adds, USA, from Nov. 1997 to Feb 2004	2-lead ECG	Single time-point	Limited to inhabitants within specific community	Opportunistic	Prevalence of AF	Total prevalence of AF: 5.1%

Author/Study	Year of completion	Country	Number of study participants or screenees	Recruitment description	Inclusion Criteria	Exclusion Criteria	Geographic location and year of study	Screening Device	Screening & f/u Duration	Recruiting Segment	Study Approach	End Point	Results
Munschauer et al. [49]	2004	USA	1839	281 community group education sessions about pulse palpitation were conducted and follow-up of this patients was performed	>50 yrs		281 community group sessions, USA	Pulse Palpation	Single time-point	Limited to inhabitants within specific community	Opportunistic	Prevalence of AF, new-onset AF	Total prevalence of AF: 9%; New AF: 0.5%
DeLemos et al. [50]	1998	USA	180	Participants recruited through an advertised community stroke screening conducted in the spring 2000	Not reported		Advertisement, USA, during 2000	3-lead ECG	Single time-point	Limited to inhabitants within specific community	Opportunistic	Prevalence of AF	Total prevalence of AF: 15.6%
Lavenson et al. [51]	1998	USA	176	The SPS protocol was used to screen 6,073 seniors residing in the central valley of California, at more than 68 institutions	>40 yrs		Central Valley California, USA,	2-lead ECG	Single time-point	Limited to inhabitants within specific community	Opportunistic	Prevalence of AF, new-onset AF	Total prevalence of AF: 9%; New AF: 9%
Furberg et al. [52]	1994	USA	5151	Random sample of the Health Care Financing Administration Medicare eligibility lists of 4 U.S. communities was contacted	≥61 yrs	wheelchair bound in the home, being treated for cancer, or likely to move in 3 years	4 communities in USA.	12-lead ECG	Single time-point	The country's general population	Systematic	Prevalence of AF, new-onset AF	Total prevalence of AF: 2.8%; New AF: 1.5%
Lake et al. [53]	1981	Australia	1770	Triennial surveys were conducted in the Busselton community in Western Australia between 1966 and 1981.	≥65 yrs		Busselton community, Western Australia	12-lead ECG	Single time-point	The country's general population	Systematic	Prevalence of AF	Total prevalence of AF: 2.3%
Rose et al. [54]	1978	England	18403	Participants identified through a national register	40-65 yrs, male		National register, England	Limb-lead ECG	Single time-point	The country's general population	Systematic	Prevalence of AF	Total prevalence of AF: 0.3%
IDEAL-MD [55]	2017	Holland	16000	Participants aged 65 or above visiting a GP practice was invited to participate in the study	≥65 yrs	Terminal illness, history of AF	GPs across Holland, from Nov. 2014, to Sept. 2016	MyDiagnostick single-lead ECG	Single time-point	The country's general population	Opportunistic	New-onset AF	Total prevalence of new AF: 0.95%

Author/Study	Year of completion	Country	Number of study participants or screenees	Recruitment description	Inclusion Criteria	Exclusion Criteria	Geographic location and year of study	Screening Device	Screening & f/u Duration	Recruiting Segment	Study Approach	End Point	Results
EARLY [56]	2015	Spain	Intervention (n=463) Control (n=465)	A random sample of 4000 candidates meeting inclusion criteria from a primary healthcare centre in an urban area was preselected. Patients were then randomized and the ones in the intervention group were invited by telephone call to participate in the study	≥65 yrs, arterial hypertension, ischemic heart disease, valvular heart disease, diabetes and/or congestive heart failure	history of AF, pacemakers	Primary healthcare centre, Spain, from Jan 2008 to Mar. 2011	12-lead ECG	Single time-point every 6 months	The country's general population	Systematic	New cases diagnosed with AF	At 6 months, AF was diagnosed in 8 IG patients and 1 CG patient (1.7 vs. 0.2%). After 2 years of follow-up, 11 IG patients and 6 CG patients had newly diagnosed AF (2.5 vs. 1.3%)
Bury G. et al. [57]	2015	Ireland	566	26 randomly selected GPs each selected 80 patients randomly	≥70 yrs	Previous AF, GP consider participation inadvisable	26 GPs, Ireland, from 2004 to ??	3-lead ECG	Single time-point	The country's general population	Selected randomly	New-onset AF	New AF found in 2.1% of participants
Rhys G. C. et al. [58]	2013	United Kingdom	573	Patients ≥65 yrs old attending flu clinics were screened.	≥65 yrs		Flu clinics, UK	Pulse assessment, ECG for patients with irregular pulse	Single time-point	The country's general population	Opportunistic	New-onset AF	Total prevalence of AF: 4.01%; New AF: 0.35%

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