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Supplementary Table 1. Detailed search strategy.

|  |  |  |
| --- | --- | --- |
| Cochrane | | |
|  | #1 | MeSH descriptor:[Atrial Fibrillation] explode all trees |
|  | #2 | MeSH descriptor:[Mass Screening] explode all trees |
|  | #3 | (Atrial Fibrillation OR Auricular Fibrillation OR Atrium fibrillation OR AF OR a-fib OR Atrial flutter OR Auricular flutter OR atrium fibrillation):ti,ab,kw |
|  | #4 | (Screening OR screen):ti,ab,kw |
|  | #5 | #1 or #3 |
|  | #6 | #2 or #4 |
|  | #7 | #5 and #6 |
|  | #8 | (older OR elder OR elderly OR aged):ti,ab,kw |
|  | #9 | #7 and #8 |
| Embase | | |
|  | #1 | 'atrial fibrillation':ti,ab,kw OR 'auricular fibrillation':ti,ab,kw OR 'af':ti,ab,kw OR 'a-fib':ti,ab,kw OR 'atrial flutter':ti,ab,kw OR 'auricular flutter':ti,ab,kw OR 'atrium fibrillation':ti,ab,kw |
|  | #2 | screening:ti,ab,kw OR screen:ti,ab,kw |
|  | #3 | older:ti,ab,kw OR elder:ti,ab,kw OR elderly:ti,ab,kw OR aged:ti,ab,kw |
|  | #4 | #1 AND #2 AND #3 AND ([controlled clinical trial]/lim OR [randomized controlled trial]/lim) |
| Pubmed | | |
|  | #1 | "Atrial Fibrillation"[Title/Abstract] OR "auricular fibrillation"[Title/Abstract] OR "atrium fibrillation"[Title/Abstract] OR "AF"[Title/Abstract] OR "a-fib"[Title/Abstract] OR "atrial flutter"[Title/Abstract] OR "auricular flutter"[Title/Abstract] OR "atrium fibrillation"[Title/Abstract] |
|  | #2 | "Atrial Fibrillation"[MeSH Terms] |
|  | #3 | "Mass Screening"[MeSH Terms] |
|  | #4 | "screen"[Title/Abstract] OR "screening"[Title/Abstract] |
|  | #5 | #1 OR #2 |
|  | #6 | #3 OR #4 |
|  | #7 | #5 AND #6 AND (clinical trial[Filter] OR randomized controlled trial[Filter]) |
| MEDLINE | | |
|  | #1 | (screening or screen).ab,ti. |
|  | #2 | Mass Screening/ |
|  | #3 | (Atrial Fibrillation or Auricular Fibrillation or Atrium fibrillation or AF or a-fib or Atrial flutter\* or Auricular flutter\* or atrium fibrillation).ab,ti. |
|  | #4 | Atrial fibrillation/ |
|  | #5 | #1 OR #2 |
|  | #6 | #3 OR #4 |
|  | #7 | #5 AND #6 |
|  | #8 | Limit 7 to (clinical study or clinical trial, all or clinical trial or comparative study or multicenter study or randomized controlled trial) |
| CINAHL | | |
|  | #1 | TI ("screen" OR "screening") OR AB ("screen" OR "screening") |
|  | #2 | TI ("Atrial Fibrillation" OR "Auricular Fibrillation" OR "Atrium fibrillation" OR "AF" OR "a-fib" OR "Atrial flutter" OR "Auricular flutter" OR "atrium fibrillation") OR AB ("Atrial Fibrillation" OR "Auricular Fibrillation" OR "Atrium fibrillation" OR "AF" OR "a-fib" OR "Atrial flutter" OR "Auricular flutter" OR "atrium fibrillation") |
|  | #3 | TI ("older" OR "elder" OR "elderly" OR "aged") OR AB ("older" OR "elder" OR "elderly" OR "aged") |
|  | #4 | #1 AND #2 AND #3 |

MeSH, Medical Subject Headings; AF, atrial fibrillation.

Supplementary Table 2. Characteristics of the included studies.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Study | Region | Design | Setting | Eligibility of participants | Participants (Intervention group/Control group) | Screening implementer | Intervention | Comparator | Outcomes | Number needed to treat (NNT) | Follow-up |
| Morgan *et al.* 2002 [31] | England | RCT | Home | Patients between the ages of 65 and 100 without known AF | 1,499/1,502 | Nurses | Systematic nurse-led screening by pulse palpation and confirmed by electrocardiogram (ECG) | Prompted Opportunistic screening: notes were flagged for pulse check and, if suspicious of AF then a confirmatory ECG | AF detection rate | 93.5 | 6 months |
| Hobbs *et al.* 2005 [12]; Fitzmaurice *et al.* 2007 [26]  (SAFE) | England | Cluster RCT | Primary healthcare centre | Patients ≥65 years without known AF | 9,866 (4,933 for Opportunistic Screening and Systematic Screeing respectively)/4,936 | Nurses | Single-time point systematic screening with 12-lead ECG device;  Opportunistic screening with pulse-taking and 12-lead ECG device if irregular pulse detected | Routine care | Primary outcomes: incidence of new cases of AF detected; incremental cost per case detected;  Secondary outcomes: cost-effectiveness of screening for AF, the methods of ECG interpretation; patients acceptability to AF screening, anxiety, and quality of life relating to AF screening. | 169.5 | 1 year |
| Benito *et al.* 2015 [25]  (EARLY) | Spain | RCT | Primary healthcare centre | With one or more risk of: ≥65 years, hypertension, ischemic heart disease, valvular heart disease, diabetes, and/or congestive heart failure, but without known AF | Randomization: 2,000/2,000 (Included: 463/465) | Doctors lead screening, nurses participate | Systematic screening using ECG every 6 months and self-pulse check once a month over 2 years | Routine care (No screening) | Primary outcomes: incidence of new cases of AF at 6-month;  Secondary outcomes: no. of AF diagnosed during 2-year; complications related to AF or its treatment, origin and means of the initial AF diagnosis | 20.7 | 2 years |
| Halcox *et al.* 2017 [15]  (REHEARSE-AF) | England | RCT | Home | Patients ≥65 years with a CHADS-VASc ≥2, without known AF | 500/501 | Doctors | Systematic screening using single-lead ECG device (AliveCor Kardia monitor) twice weekly over 12 months | Routine care | Primary outcomes: time to diagnosis of AF,  Secondary outcomes: clinical events including stroke or TIA or systemic embolism; death, major bleeding; participants’ experience about screening, intervention cost per AF diagnosis | 41.7 | 4.2 years |
| Kaasenbrood *et al.* 2020 [28] | Netherlands | Cluster RCT | Primary healthcare centre | Patients ≥65 years without known AF | Randomization: 9,542/9,374  (People without atrial fibrillation: 8,581/8,526) | Doctors | Single-time point opportunistic screening with handheld single-lead ECG (MyDiagnostick) | Routine care (no screening) | Primary outcomes: incidence of new AF, anticoagulant rate | 769.2 | 1 year |
| Uittenbogaart *et al.* 2020 [32]  (D2AF) | Netherlands | Cluster RCT | Primary healthcare centre | Patients ≥65 years without known AF | 9,400/9,789 | Doctors and nurses | Opportunistic screening using multiple methods including pulse palpation, blood pressure monitor (WatchBP-Home A), handheld Single-lead ECG (MyDiagnostick), and 12-lead ECG if negative of all above three tests, and holter-ECG if negative of 12-lead ECG. | Routine care | Primary outcome: Number of new cases of AF | 147.1 | 1 year |
| Gladstone *et al.*2021 [27]  (SCREEN-AF) | Canada and Germany | Multicentre RCT | Home | Patients ≥75 years with hypertension but without known AF | 434/422 | Doctors | Systematic screening using Zio patch for 2 weeks, one at baseline and another at 3-month, and with blood pressure monitor (WatchBP-Home A, Microlife Corp) recording twice daily for 6-month. | Routine care with pulse palpation and cardiac auscultation at baseline and 6 months | Primary outcomes: detection r of AF,  Secondary outcomes: anticoagulant rate, device adherence, clinical outcomes (e.g., death, ischemic strokes and other systemic embolism, major bleeding | 126.6 | 6 months |
| Svennberg *et al.* 2021 [13]  (STROKESTOP) | Sweden | Multicentre, parallel group, unmasked, RCT | Primary healthcare centre | Residents aged 75 or 76 | 14,387/14,381 | No information | Systematic screening using handheld single-lead ECG (Zenicor II); if no atrial fibrillation with the index ECG, then twice daily for two weeks | Routine care | Primary outcomes: combined endpoint of ischemic or hemorrhagic stroke, systemic embolism, bleeding leading to hospitalization, all-cause mortality;  Secondary outcomes: detection of AF, death from cardiovascular disease (CVD), hospitalization due to CVD, ischemic stroke, a composite of ischemic stroke and systemic thromboembolism, initiation of oral anticoagulant therapy, cost-efficacy analysis. | 27.3 | 5 years |
| Zhang *et al.* 2021 [14]  (AF-CATCH) | China | RCT | Primary healthcare centre | Patients ≥65 years without known AF | 3,562 (2,841 for quarterly screening and 721 for quarterly plus)/3,244 | No information | Systematic screening at quarterly or quarterly plus (screening once per week for the first month in addition to quarterly screening) for 2-year using handheld Single-lead ECG (AliveCor) | Annual screening (Systematic screening once a year) | Primary outcomes: detection of new cases of AF, secondary outcomes: clinical events including all-cause mortality, cardiovascular deaths, hemorrhagic and ischemic stroke, acute coronary syndrome | 60.2 | 2 years |
| Lubitz *et al.* 2022 [30]  (VITAL-AF) | United States | Cluster RCT | Primary healthcare centre | Patients ≥65 years without known AF | 15,393/15,322 | Doctors and assistant | Point-of-care screening at a single time point using handheld single-lead ECG (AliveCor KardiaMobile ECG device) | Routine care (no screening) | Primary outcomes: incidence of newly diagnosed AF,  Secondary outcomes: change in the incidence proportion of AF before and after screening, anticoagulant rate | 1111.1 | 1 year |
| Lopes *et al.* 2024 [29] | United States | RCT | Primary healthcare centre | Patients ≥70 years without known AF | 5,952/5,953 | No information | Systematic screening using Zio patch for 2 weeks | Routine care (no screening) | Primary outcomes: hospitalization for all-cause stroke (ischemic and hemorrhagic), hospitalization for bleeding,  Secondary outcomes: Newly Diagnosed AF, Oral anticoagulation | 61 | 15.3 months |
| Wong *et al.* 2024 [33] | Australia | RCT | Home | Patients ≥75 years without known AF | 100/100 | No information | Self-recorded their ECGs using AliveCor KardiaMobile ECG device once daily on weekdays | Routine care with their general practitioners (GPs) in the first 6 months | Primary outcomes: new AF diagnosis,  Secondary outcomes: Oral anticoagulation, healthcare visits | 12 | 6 months |

Fig. 1 Risk of bias using the RoB 1 tool

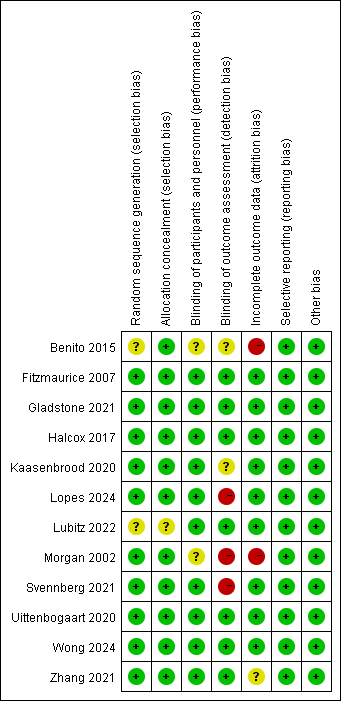


Fig. 2 Risk percentage for each domain and overall risk of bias using the RoB 1 tool

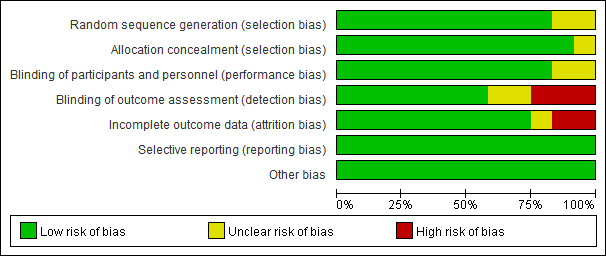


Fig. 3 Subgroup analysis of AF detection according to age

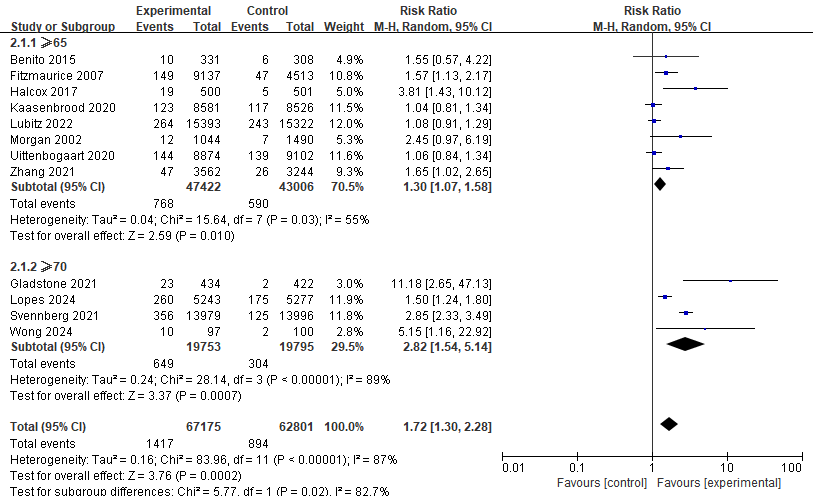


Fig. 4 Subgroup analysis of AF detection according to intensity of screening

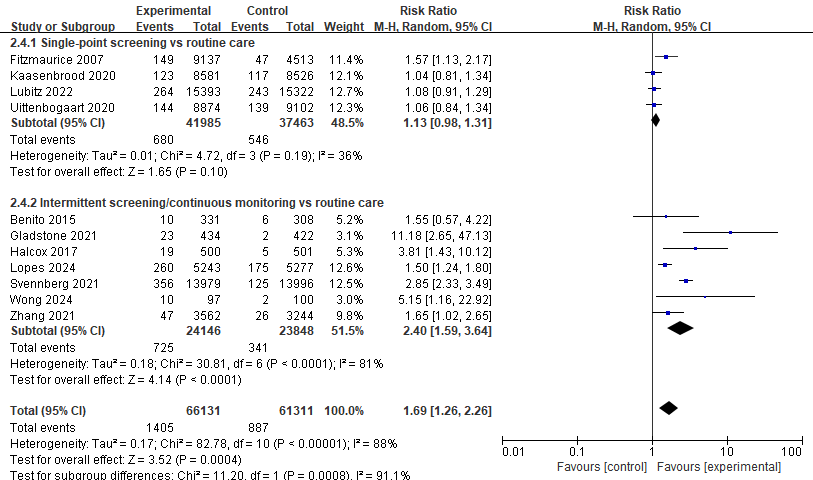


Fig. 5 Meta-analysis on prescription of anticoagulant

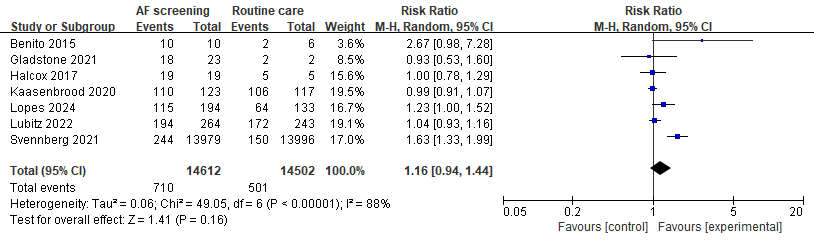
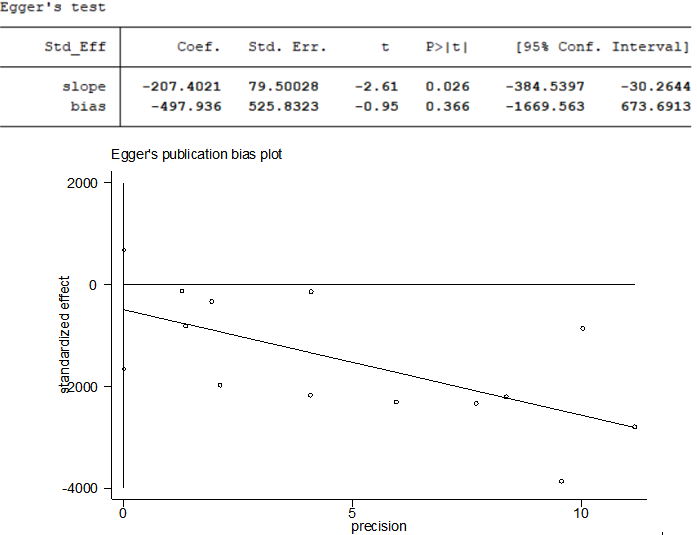


Fig. 6 Funnel plot



Fig. 7 Egger’ s test

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