Co-funded by
the Health Programme
of the European Union

advantAGE
MANAGING FRAILTY

Title:	Frailty at Population Level: A Systematic Review
WP Leader:	HSE-NUIG.
Work package:	WP5
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Due submission date:	31/10/2017

This report is part of Joint Action '724099 / ADVANTAGE' which has received funding from the European Union's Health Programme (2014-2020).

EXECUTIVE SUMMARY

Background:

The Joint Action (JA) on Frailty Prevention, called ADVANTAGE, aims to develop a holistic and comprehensive strategic framework for the prevention and management of frailty at European level. Although frailty is increasing worldwide, its prevalence at population level in Europe is unclear and little is known about frailty incidence, trajectories or transitions between different stages of frailty, or the feasibility, consequences and potential benefits associated with screening, surveillance and monitoring for frailty at population level.

Objectives:

To investigate (1) the current epidemiological data (prevalence, incidence and trajectories/transitions) concerning frailty and (2) the evidence supporting the development, implementation and evaluation of population-based approaches to screening, surveillance and monitoring of frailty, including those delivered in the primary care setting, in 22 European Union (EU) JA ADVANTAGE Member States (MSs).

Methods:

We systematically reviewed the published literature using the PubMed, Embase, CINAHL, MEDLINE, Opengrey and the Cochrane Library databases from January 2002 through to April 2017. Good practices and grey literature from ongoing or unpublished European-supported frailty projects were also sought from JA ADVANTAGE MS partners. Selected studies were those that explicitly addressed the epidemiology of frailty and population-based approaches in adults (≥18) in any settings in JA ADVANTAGE MSs to investigate the prevalence and incidence of frailty, trajectories and transitions between different stages of frailty and the current practice of screening, surveillance and monitoring for frailty.

Results:

Five systematic reviews were conducted. A total of 5,030 abstracts were screened independently by two assessors. After eligibility assessment, 69 full papers were analysed to extract data relating to the five topics addressed by the systematic reviews:

(1) Prevalence and incidence; n=63 papers,
(2) Screening; n=3,
(3) Surveillance; n=0,
(4) Monitoring; n=0 and
(5) Trajectories and transitions; n=3.

Prevalence of frailty varied between settings, and by age range and frailty assessment instrument used. Most studies reporting prevalence data were from community-based

samples (n=53) with only five studies available from primary care. Studies from Spain (n=11) and the Netherlands (n=11) were best represented in the literature. The main frailty classification used was the Frailty phenotype based on the Cardiovascular Health Study (56% of all studies). The highest prevalence rates were from studies set in hospital wards (around 50%) and Long-Term Care (≥60%). Lower rates, around 30%, were found in studies of adults >18 years in primary care and outpatient settings. The prevalence reported in community samples ranged from 2-60% with most reporting rates <30%. No prevalence data were available for five JA ADVANTAGE countries (Bulgaria, Croatia, Cyprus, Lithuania or Malta). Prevalence largely increased with age irrespective of settings. Three studies reported on frailty incidence but used incidence proportions rather than rates; sample characteristics and follow-up length were heterogeneous, limiting comparability. Two studies meeting inclusion criteria reported approaches to screen for frailty; both used a two-step screening and assessment method. Both were conducted in the community, one in primary care and the other in patients' homes. No study from a JA ADVANTAGE MS described a systematic process for surveillance or monitoring of frailty. Studies presenting data demonstrating frailty transitions or trajectories in JA ADVANTAGE MSs (n=3) were also heterogeneous in design (sample, definition of frailty, duration of follow-up and outcomes, etc.) making comparison challenging.

Recommendations for JA ADVANTAGE:

Prevalence and incidence of frailty varied by study setting, design, population features and frailty classification used. Few papers reported data from primary care. The lack of data for population-level approaches to screening, surveillance and monitoring of frailty, or on frailty transitions, limits conclusions. The extent of the heterogeneity between studies in terms of setting, age range, gender balance, follow-up duration and frailty classification needs to be addressed to provide more reliable and comparable estimates of frailty incidence and prevalence and to develop and harmonise data sets across JA ADVANTAGE MSs.

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ACRONYMS

CFS - Clinical Frailty Scale.

CHS = Frailty phenotype.

eFI = Electronic Frailty Index.

EHIS = European Health Interview Survey.

EU = European Union.

FI = Frailty Index (based on accumulation of deficits, varying by the number of deficits included e.g. 32 or 56).

GFI = Groningen Frailty Indicator.

HSE-NUIG = Health Service Executive of Ireland-National University of Ireland, Galway

ISAR = Identification of Seniors at Risk tool.

JA = Joint Action.

LTC = long-term nursing home care.

MS = Member State.

NA = Not Available

SAGE = Study on Global Ageing and Adult Health.

SHARE = Survey of Health and Retirement in Europe.

SHARE FI - Survey of Health, Ageing and Retirement in Europe Frailty Index.

SOF = Study of Osteoporotic Fractures.

TFI - Tilburg Frailty Indicator.

UK = United Kingdom.

VES-13 = Vulnerable Elders Survey-13.

WP5 = Work Package 5.

INTRODUCTION

The Joint Action (JA) initiative on the Prevention of Frailty, called ADVANTAGE, co-funded by the European Third Health Programme (2014-2020), aims to develop a holistic and comprehensive strategic framework for the prevention and management of frailty at European level. Although the prevalence of frailty has been reported to be between 4-59.1% in community-based studies (Collard et al., 2012), there is marked variation in these in terms of methodological approaches, rendering geographical comparisons unclear. Little is known about the incidence, trajectories and transitions between different stages of frailty, or the feasibility, consequences and potential benefits of programmes or interventions for systematic screening, surveillance and monitoring of frailty at a population level. Several longitudinal studies on ageing have shown that frailty is more common with greater age, female gender and socioeconomic factors including lower education and wealth (Harttgen et al., 2013) and that there is wide variation across JA ADVANTAGE member states (MSs) where data are available (Santos-Eggimann et al., 2009). Data from the Survey of Health and Retirement in Europe (SHARE) and the Study on Global Ageing and Adult Health (SAGE) studies, reporting mean Frailty Index (FI) scores, based on the accumulation of deficits theory, found the lowest levels of frailty in Ireland, Greece and the Netherlands with the highest levels in Italy, Spain and Poland (Harttgen et al., 2013). Most studies reporting prevalence rates are limited to community-based samples with little data from other important care settings such a primary care, acute care, home care and long-term nursing home care (LTC). Similarly, little is known about the incidence of frailty (Xue et al., 2011). Although transitional states with bi-directional frailty trajectories have recently been described (Gill, 2006, Lang et al., 2009), data is still lacking. While several societies, healthcare organisations, consensus groups and meeting statements have promoted frailty screening and monitoring (Santos-Eggimann et al., 2016), to date there is little empiric evidence on its acceptability and effectiveness. This review aims to:

(1) Summarise the data on frailty prevalence, incidence, trajectories and transitions between different stages of frailty in JA ADVANTAGE MSs.
(2) Investigate the existing evidence for systematic programmes and interventions for screening, surveillance and monitoring of frailty in JA ADVANTAGE MSs.

Given the importance of primary care in the management of frailty, screening in this setting was specifically highlighted as an objective. International data from non-JA ADVANTAGE MSs was included, where available and relevant, to provide context and comparison.

METHODS

Peer-reviewed literature

We conducted a systematic search of the literature published between January 2002 and April 2017 using PubMed, Embase, CINAHL, (MEDLINE), Opengrey and the Cochrane databases. References lists of included papers were also researched for relevant articles. For practical purposes the search was broken into five separate systematic reviews: (1) Prevalence and incidence, (2) Screening, (3) Surveillance, (4) Monitoring and (5) Trajectories and transitions. Detailed search terms are presented in Annex 1.

Inclusion and exclusion criteria

Papers were included if they met all the following criteria:

(1) Described data relating to frailty using any definition of frailty, irrespective of the method of data collection or instrument used;

(2) Included participants aged ≥18 (no maximum limit);

(3) Reported population-based outcome data without a restriction on the setting i.e. findings that can be extrapolated to a larger population defined in terms of geographical area, age group and setting (e.g. general population, hospitals, and LTC). Data were included from specific settings e.g. patients in geriatric wards, only if there was evidence that all individuals in the population could be recruited from that setting. Specific definitions for each outcome were agreed in advance among participants in the review and a detailed guidance was developed.

The following definitions were adopted:

- *Prevalence of frailty* was defined as the proportion of cases in a population in a specific moment (point prevalence) or over a specific period of time (period prevalence).
- *Incidence of frailty* was defined as the number of new cases per population in a given time period.
- *Screening* - systems, programmes, processes and interventions specifically designed to identify frailty in a target population to intervene to mitigate or reduce it at population level.

- *Surveillance* - systematic process for the collection, analysis and interpretation of health-related data on frailty needed for the planning, implementation, and evaluation of public health interventions.
- *Monitoring* – the process of observing for longitudinal changes in the health status (frailty) of a population. Monitoring is related to surveillance but is not necessarily the trigger for a specific public health action. It can serve to measure the effect of an intervention on the health status of a population over time.
- *Trajectories* or Transitions - changes between different stages of frailty over time, (i.e. transition from robust, pre-frail, frail and back), and factors influencing these changes.

(4) Reported data from a JA ADVANTAGE MS in English or any language of a MS partner.

(5) Published data between 2002 and April 2017. Papers published before 2002 were included on a case-by-case basis if discovered opportunistically and deemed relevant.

(6) Presented original articles. Letters to the editor, abstract publications, conference proceedings, non-systematic reviews (narrative reviews etc.), and editorials were excluded.

Reasons for exclusion were: (1) Replicated data; (2) not in English or language of JA ADVANTAGE partner; (3) not an original article; (4) not about the topic and (5) other including papers focusing on individuals with specific diseases. Data from non-JA ADVANTAGE MSs were considered for comparison. Predictors of frailty or risk/protective factors for frailty or the impact of frailty on outcomes were only recorded for the review on transitions and trajectories.

Data extraction

Two pairs of reviewers independently assessed studies for inclusion. A third reviewer settled disagreements. Data from articles assessed as eligible for inclusion were extracted and analysed.

Grey literature

Good practices, grey literature and data from ongoing or unpublished frailty projects funded by the European Union or registered with the European Innovation Partnership on Active and Healthy Ageing were included based on information provided by partners about unpublished data or materials – available through websites, reports, and academic thesis etc.

RESULTS

Overview of search results:

The selection of relevant papers for the systematic reviews is depicted in a PRISMA flow diagram in Annex 2 (Figures 1.1-1.5). In total, 7,283 citations were returned across the five systematic reviews of which 1,085 duplicates were automatically removed yielding 6,198 abstracts for review: (1) Prevalence and incidence (n=2,948); (2) Screening (n=1,186); (3) Surveillance (n=751); (4) Monitoring (n=451); and (5) Trajectories and transitions (n=862). After additional manual removal of duplicated data, 5,030 abstracts were reviewed. From these, 448 full papers were retrieved of which 69 were included across the five reviews: (1) Prevalence and incidence (n=63); 62 papers with prevalence data providing 68 unique prevalence data sets, two of which also included incidence data and one paper from Finland (Stenholm et al., 2014) that only provided incidence data; (2) Screening (n=3); (3) Surveillance (n=0); (4) Monitoring (n=0); and (5) Trajectories and transitions (n=3). These data are presented in Annex 3 (Tables 1.1-1.4). Two systematic reviews reporting frailty prevalence data in older community-dwellers (Collard et al., 2012) and nursing home residents (Kojima et al., 2015), included results from JA ADVANTAGE MSs and were used to obtain relevant studies but were excluded from the review. Pooled data from 8 European centers in the European Male Ageing Study (Tajar et al., 2011) were also excluded, as country-specific data were not available. In addition, good practice initiatives (n=3), ongoing or unpublished EU-funded trial data (n=4), and grey literature items (n=4), mostly found in Spain (n=5), were identified and analysed (Annex 4).

Prevalence of Frailty at Population Level:

A diverse range of studies reported the prevalence of frailty in JA ADVANTAGE MSs. As results from SHARE countries were abstracted from a single paper by (Santos-Eggimann et al., 2009), community dwellers aged ≥65 assessed using the SHARE Frailty Index (SHARE FI), but presented as country level data, a total of 68 unique data sets were derived from 62 papers that reported prevalence data. Reflecting a syndrome in its relative infancy, the majority of papers in JA ADVANTAGE MSs were published since 2012 (84%).

Data were found across multiple settings at population level including primary care (n=5), outpatient geriatric clinics (n=4), long-term care (LTC) (nursing homes) (n=3), hospitals (n=2), public health centres (n=1) and in community-based samples (n=53) recruited using observational, cross-sectional or cohort designs. Fifteen (68%) of the JA ADVANTAGE MSs had at least one published study reporting data on frailty prevalence rates with the greatest number of studies found in Spain (n=11) and the Netherlands (n=11). Prevalence data according to gender were available for Hungary (11.4% for females and 5.4% for males) and

Slovenia (6.1% for females and 2.3% for males ≥50 years) from the SHARE study (Romero-Ortuno et al., 2014), though no overall prevalence data were available for these countries. No published data were found for 5 JA ADVANTAGE MS's: Bulgaria, Croatia, Cyprus, Lithuania or Malta. In addition, 135 studies with prevalence data were found for non-JA ADVANTAGE MSs including other European countries: Denmark (n=1), Sweden (n=1) and Switzerland (n=3). These data were all from longitudinal community-based cohorts, predominantly from SHARE. The prevalence rate of frailty in SHARE in those ≥50 years was 12.4% in Denmark, 8.6% in Sweden and 5.8% in Switzerland (Santos-Eggimann et al., 2009). Multiple studies from outside Europe were available from the USA (n=24), Brazil (n=23), Canada (n=11) and China (n=9). Again, there was marked heterogeneity between these studies limiting pooled analysis.

The most commonly reported classification of frailty in JA ADVANTAGE MSs was the Frailty phenotype based on the findings of the Cardiovascular Health Study (CHS; Fried et al. 2001) (n=38, 56%), followed by the SHARE Frailty Index (SHARE FI) (n=12), the Groningen Frailty Indicator (n=3), the Clinical Frailty Scale (n=2) (Rockwood et al. 2005), the Study of Osteoporotic Fractures (SOF) Index, (n=2) and others (n=11). Several studies included more than one measure highlighting different prevalence rates according to the classification method.

The prevalence rates of frailty varied between settings, population type and frailty assessment instrument used. The highest prevalence rate was found among residents (≥65) in nursing homes in Poland (75.6%) and patients (≥65) in primary care in Romania (75%); the lowest rate in longitudinal cohorts in Ireland (2% in persons ≥50 using a 32-item FI) and Germany (2.6% in those 65-79 using Frailty phenotype). Most community-based samples (48/53, 91%) reported prevalence rates of <30%, though results ranged from 2 to 60%, with a median prevalence of 10.8% with quartiles (Q1-Q3) of 7.2% and 16.5%. The most common age cut-off selected was ≥65 years. Two studies reported prevalence rates of 54% among hospital inpatients, while outpatients studies reported figures approximating 30%. In LTC, the prevalence rate of frailty ranged between 62.1% and 75.6% for three studies, which included patients aged ≥65 years.

Only five studies reported the prevalence rate of frailty in primary care, which also varied by design and sampling. Most of these (three out of the five studies) reported a prevalence rate of approximately 30% with evident outlier results in Romania (75% in those ≥65 measured with the Groningen Frailty Indicator (GFI) (Olaroiu et al., 2014) and the United Kingdom (UK) (3.9%, although in a younger population ranging from 50-65 years old and measured with the Frailty phenotype) (Palmer et al., 2017).

Incidence of Frailty at Population Level:

Three papers on frailty incidence were included in the systematic review, reporting data from Germany, Spain and Finland (Table 1.2 in Annex 3). All presented incidence proportions, instead of incidence rates, using the definition of frailty based on the Frailty phenotype. The incidence of frailty in the German (Vogt et al., 2015) and Spanish studies (León-Muñoz et al., 2014), although based on similar samples in terms of age (≥ 65; ≥ 60) and follow-up length (mean years 2.9; 3.5), varied from 3.9% to 7.5%, respectively. In Finland, the proportion developing frailty, based on a younger sample (mean age 43.6 years) followed-up for longer (22 years), was 5% (Stenholm et al., 2014).

Two non-European incidence studies were identified, one from Texas in the USA (Espinoza et al. 2010) and one from Beijing, China (Zheng et al. 2016). Zheng et al. (2016), the only study that provided disaggregated results according to gender and age, showed an increasing incidence with age and a higher probability of developing frailty for women (the overall incidence of frailty was 13% at 1 year in those ≥55). The frailty incidence results in Germany and Spain seem higher than those reported in Texas, where the incidence proportion was 7.8% in those ≥65 years during 9.9 years (Espinoza et al., 2010).

Screening, Surveillance and Monitoring of Frailty at Population Level:

Few papers reporting on systems, programmes, processes and interventions to screen for frailty at population level (n=3) met the inclusion criteria. No study was found reporting data on monitoring or surveillance of frailty at a population level in JA ADVANTAGE MSs. Of the three papers on frailty screening, two evaluated screening approaches in JA ADVANTAGE MSs: Italy (Razzanelli et al., 2013) and the Netherlands (van Kempen et al., 2013). An additional qualitative study incorporating a grey literature search described screening approaches in the Netherlands (Lette et al., 2015). A single study from Japan by (Shinkai et al., 2016) described a process for both screening and monitoring of frailty in a non-JA ADVANTAGE MS.

The two studies from JA ADVANTAGE MSs are summarized in Table 1.3 of Annex 3. Both were carried out at a local level in the community and both used a two-step screening approach. The first step consisted on a questionnaire to review the patients' information in the general practitioners' clinical records in the Dutch study and a postal questionnaire in the Italian one. The second step used a structured assessment in both cases. The two studies showed that the intervention was feasible and acceptable in primary care, but their definition of frailty was very broad. Lette et al. (2015) conducted a grey literature search followed by semi-structured interviews with experts in preventive care of older adults and group interviews with older adults. Apart from the verification that there were a wide variety of approaches to screening for frailty in the Netherlands, the authors gathered information on the experiences of healthcare professionals with these initiatives and the preferences and needs of older people. A lack of clarity in the definition of frailty, difficulty in eliciting psychosocial issues through questionnaires compared to home visits, overlapping

of preventive initiatives between services, the weak evidence base of many initiatives, ill-defined target groups and limited consideration of the follow-up of the detected problems were mentioned as usual limitations. General practitioners were the preferred healthcare professional to identify physical health problem and risks. The main conclusions are that more insight is needed into '*what should be done by whom, for which target group and at what moment*' and that there is a '*risk that current initiatives insufficiently address the needs of (frail) older people*'.

While no study described systems for monitoring frailty in JA ADVANTAGE MS, in Japan, (Shinkai et al., 2016) described an intervention designed to monitor frailty through biennial health monitoring surveys. The authors created a strategy for frailty prevention, targeting robust and frail older adults using primary (health education programme), secondary (comprehensive geriatric assessment as part of routine annual health check-ups) and tertiary level preventive interventions. Older adults in the municipality of Kusatsu, aged ≥65 (1,737 in 2001 and 2,287 in 2011) screened as frail or at high-risk of frailty were encouraged to participate in long-term prevention programmes. The authors reported good response rates (30–40% annual participation in check-ups, with over 80% of the target population participating at least once during 10 years of follow-up) and found that preventive programmes significantly increased the functional status of subjects and reduced the incidence rate of disability in those aged ≥75 years, extending healthy life expectancy at 70 years by 1.2 years for women and 0.5 years for men.

Currently, there are several on-going projects in Europe with the objective of developing innovative strategies to address frailty at population level (see Annex 4). In Ireland, Spain and Portugal the Community Assessment of Risk Tool and Strategies study (O'Caoimh et al., 2015) explores the use of a two-stage population based screening and assessment programme to identify and target frailty in older community-dwelling older adults. The PERSSILAA study also used a two-stage screening and assessment programme but this time to identify and separate robust, pre-frail and frail community dwelling older adults in Italy (church groups) and the Netherlands (primary care) (O'Caoimh et al., 2017). In Spain, The Ministry of Health (2014), in agreement with all regional ministries and professional associations has developed a common protocol to screen for frailty in primary care. Furthermore, the Region of Andalusia (Servicio Andaluz de Salud, 2008) has in place a programme to screen and manage/monitor frailty at population-level. Neither of these two strategies has been evaluated. In the UK, the recent validation of an electronic Frailty Index (eFI) to be used with primary care patient records shows the potential to utilise existing electronic information resources to quickly screen and identify frailty in the community for further assessment (Clegg et al., 2016).

Frailty Trajectories and Transitions at Population Level:

As frailty is a dynamic process with trajectories changing over time with evidence for transition from robust to pre-frail and frail with some limited reversibility (Lang et al., 2009), we investigated evidence on the pattern of frailty trajectories and transitions in EU JA ADVANTAGE MS populations. Most studies on trajectories or transitions between stages of frailty were from non-JA MSs and reported data from longitudinal population-based cohort studies. In total, three papers presenting data on frailty trajectories or transitions from JA ADVANTAGE MSs, the UK (n=1), Netherlands (n=1) and Italy (n=1), were included (Table 1.4 in Annex 3). Data from the English Longitudinal Study of Ageing gathered between 2002 and 2010 showed that higher levels of frailty in women compared with men persisted over time, based on a 56-item FI. The study found that moderate physical activity reduced the progression of frailty in some age groups (particularly those ≥65) and vigorous activity significantly reduced the trajectory of frailty. However, mild physical activity was insufficient to slow progression (Rogers et al., 2017). The results also showed the impact that socioeconomic factors have on frailty trajectories with those in lower socioeconomic groups more likely to transition to frailty. In Italy, 36.4% of those followed in the Pro VA Longitudinal Study had at least one frailty transition over 4.4 years of follow-up. Older age, female gender, obesity, cardiovascular disease, osteoarthritis, hypovitaminosis D, hyperuricemia, smoking, vision loss, dependence in activities of daily living, cognitive impairment, low monthly income and poor physical performance were significantly associated with greater risk of becoming frail. Improvements in frailty status in participants who were frail or pre-frail at baseline were associated with being overweight, having low-moderate alcohol consumption, higher educational level and living alone, (Trevisan et al., 2017). In the Netherlands, 169 participants attending primary care as part of the PERSSILAA study (O'Caoimh et al., 2017) completed the GFI at baseline and end-point over two years. The study found that most robust participants at baseline (78%) remained robust. Half (50%) of participants who were pre-frail or frail also remained stable. It was found that 25% of frail participants transitioned back to pre-frail while 25% of pre-frail participated transitioned to robust. Overall, 20% converted from pre-frailty to established frailty over two years and 34.3% had at least one frailty transition. However, the numbers were small, duration of follow-up short and based on the GFI, which may have been overly sensitive to change. In non-JA ADVANTAGE countries reported data on transition states from robust to pre-frail and frail were also heterogeneous with different severity transition patterns reported, the most consistent being the proportion with any frailty transition during follow-up, which ranged from 22% over 6 years using the VES-13 in participants with a mean age of 79 in Israel (Bentur et al., 2016) to 61% over 10 years using the Fried Frailty phenotype in those with a mean age of 78 in the United States (Ottenbacher et al., 2009). Acute illness and hospitalisation were identified in the United States (Gill et al., 2011) and polypharmacy in Australia (Jamsen et al., 2016) as the most common precipitating factors resulting in transitions to more severe frailty states.

CONCLUSION

The review found multiple published papers reporting on the prevalence rate of frailty in JA ADVANTAGE MSs, although there was considerable heterogeneity between studies in design, sample, setting and reporting. As expected, the highest prevalence rates were from studies among hospital inpatients (around 50%) or set in LTC (more than 60%). Lower figures, around 30%, were found in studies in primary care and outpatient settings. The prevalence rates reported in community studies ranged from 2-60% (median 10.8%) with 91% reporting prevalence rates <30%, consistent with the global weighted rate of 10.7% in community population aged ≥65 years as reported by (Collard et al., 2012) but lower than the prevalence rate of frailty in developing countries (At et al., 2015; Harttgen et al., 2013). Overall, while multiple papers on prevalence rates were available, most came from just five JA ADVANTAGE countries (France, Germany, Italy, the Netherlands and Spain). Five countries belonging to the JA ADVANTAGE did not have prevalence data available. Poland seems to have especially high prevalence rate, both in our review and those from others (Harttgen et al., 2013). The Frailty phenotype was the most commonly used frailty classification. The North-South, age and gender gradients of frailty cannot be verified through the results gathered by the present review due to the difficulties comparing the studies. The few incidence studies available for JA ADVANTAGE MSs show a great variability of findings. The adoption of incidence (or cumulative) proportions, highly influenced by duration of follow-up, further limits the comparability of results. There remains much uncertainty over how to detect and measure frailty and no agreement on the feasibility, consequences and potential benefits of population-based screening (Santos-Eggimann et al., 2016). This reflects a lack of evidence for screening as per Wilson's criteria (Wilson et al., 1968). Our search of the literature revealed only two studies reporting approaches to screening for frailty, both utilising a two-step screening and assessment strategy in the community (primary care or home). There were no studies from JA ADVANTAGE MSs that reported data from regional, national or inter-regional/national programmes for screening, monitoring or surveillance of frailty. Studies of frailty transition were few (n=3) and very heterogeneous, limiting comparability, though multiple risk and protective factors for severity transitions were identified that could be used to identify those at high risk of transitioning to more severe frailty states or to target interventions designed to mitigate these trajectories.

Limitations:

Although the approach to reviewing the literature used was standardised and the most important databases included, some papers may have been missed. Further, it was impossible to pool the results in a meta-analysis due to the variability in the design of the studies, especially the definition of frailty used. Our search for good practices and grey literature was not systematic and therefore some relevant programmes and practices may

have been missed. Nevertheless, most relevant results should have been published in peer-reviewed literature.

Recommendations:

(1) *Develop a sound common methodological approach to measure and collate prevalence and incidence data on frailty at population-level in the EU*.

More study is required to establish the prevalence and incidence rates of frailty in EU JA ADVANTAGE MSs, especially in those countries where no data are available so far. To facilitate comparison of data and provide a more accurate measure of the risk of developing frailty at population level, incidence data should be analysed as incidence rate (or person-time rate), instead of incident proportion (or cumulative incidence). Moreover, prevalence and incidence data disaggregated by age, gender, socioeconomic and frailty severity status are of utmost importance to provide a reliable epidemiological picture of frailty. Further, as most data were available from community-based longitudinal studies and cross sectional population-based surveys, more studies in different settings are required. Until a consensus definition of frailty is accepted and in an attempt to improve comparability and generalisability, studies should measure both the Frailty Phenotype and a FI with a standardised number of age-related health deficits e.g. 32 items. The inclusion of a common frailty instruments in national health surveys could contribute to the availability of more comparable population-based data at EU level, especially if this could be integrated in the European Health Interview Survey (EHIS), which is regulated by the European Commission and already collects comparable data across different domains (health status, health determinants, use of health care). It could also be incorporated into the European Health Examination Survey (EHES) (funded by European Commission/DG Santé). Overall, well-designed and suitably powered prevalence and incidence studies of frailty at European level are necessary. The paucity and heterogeneity of data highlights the need to approach this in a standardised and harmonized way across the EU. Ongoing and future longitudinal studies on ageing in Europe could be adapted to support this.

(2) *Develop, evaluate (to build the evidence base), standardise, support and then scale-up screening, monitoring and surveillance programmes for frailty at population level in the EU.*

Evidence on the feasibility, consequences and potential benefits of screening and on the practicality of surveillance and monitoring programmes for frailty at a population level should be obtained by piloting regional programmes throughout Europe. Screening could be focused on primary care using a two-step screening and assessment strategy. Follow-up and intervention should be as essential to the programme as the screening procedure. The needs and opinions of beneficiaries should also be taken into account. Ongoing European projects such as SHARE and the future evaluation of screening programmes in countries like Spain and the UK (routine use of an eFI in primary care) might act as a platform for building

the evidence base for monitoring and screening programmes, respectively, and provide more detailed guidance on the development and scaling-up of these strategies.

(3) *Support data collection and projects that measure frailty trajectories and transitions between different levels of frailty severity at population level in the EU.*

There is limited evidence on frailty trajectories and transitions available from EU JA ADVANTAGE MSs. Existing data from ongoing longitudinal studies of ageing such as SHARE might be used to better understand these in Europe. More data on predictors and risks for transitions are also required. Agreement on the timing of suitable intervals to assess the trajectory of frailty is important and recommendations to standardise these should be made. Well-designed incidence studies should help inform this. Again, developing standardised approaches to defining and measuring frailty is important to ensure comparability of findings across JA ADVANTAGE MSs.

(4) *Emphasize the potential role of primary care in identifying and preventing frailty at population level in the EU.*

There is a paucity of data on the epidemiology of frailty in primary care with only a small number of prevalence studies (five) set in general practice, suggesting the need to design studies specifically measuring these in primary care. Some data are available on screening programmes in this setting adopting a two-step frailty screening and assessment model. Further studies are required to investigate the role that primary care can have in facilitating the screening, monitoring and surveillance of frailty and how this could lead to better, more integrated care for frail older adults in the EU. Initiatives such as the UK's eFI hold promise.

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ANNEX 1. SEARCH TERMS FOR THE FIVE SYSTEMATIC REVIEWS

Systematic Reviews	Search Terms
Prevalence and incidence	Prevalence"; OR "Incidence", OR" Epidemiology" AND "Elderly" OR "Aged" OR "Older adult$" OR "Older person$" OR "Geriatric$" AND "Frailty", OR "Frail" AND "Population-based" OR "Population based" NOT "Frailty model" OR "Frailty survival model"
Screening	"Screening" AND "Elderly" OR "Aged" OR "Older adult$" OR "Older person$" OR "Geriatric$" AND "Frailty", OR "Frail" AND "Process$", OR "Programme$", OR "Program$" OR "Intervention$";
Surveillance	"Surveillance" AND "Elderly" OR "Aged" OR "Older adult$" OR "Older person$" OR "Geriatric$" AND "Frailty", OR "Frail" AND "Process$", OR "Programme$", OR "Program$" OR "Intervention$"
Monitoring	"Monitoring" AND "Elderly" OR "Aged" OR "Older adult$" OR "Older person$" OR "Geriatric$" AND "Frailty", OR "Frail" AND "Process$", OR "Programme$", OR "Program$" OR "Intervention$"
Trajectories and transitions	"Trajectories" OR "Trajectory" OR "Transition$"; AND "Elderly" OR "Aged" OR "Older adult$" OR "Older person$" OR "Geriatric$" AND "Frailty", OR "Frail"

ANNEX 2. PRISMA FLOW DIAGRAMS FOR THE FIVE SYSTEMATIC REVIEWS

Figure 1.1. PRISMA flow diagram of the identification of eligible studies on prevalence and incidence of frailty at population level in Joint Action (JA) member states.

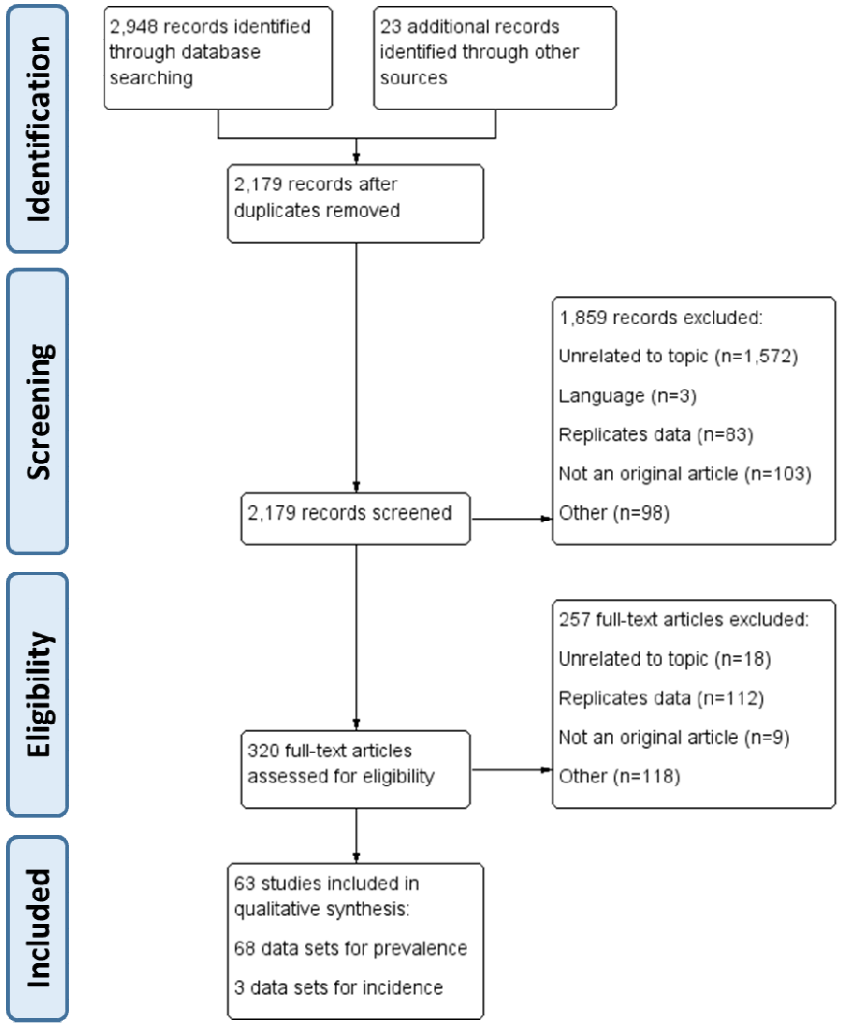

Figure 1.2. PRISMA flow diagram of the identification of eligible studies on screening of frailty at population level in Joint Action (JA) member states.

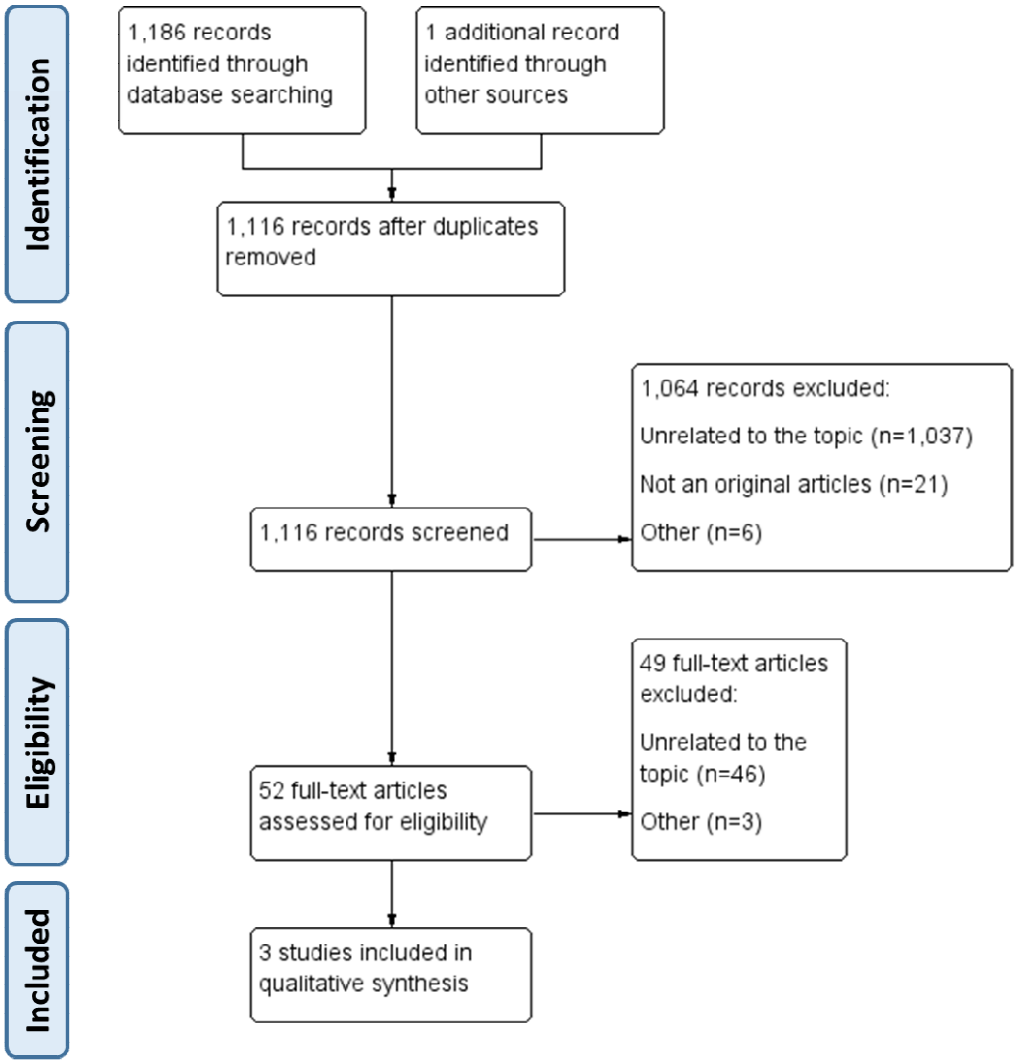

Figure 1.3. PRISMA flow diagram of the identification of eligible studies on surveillance of frailty at population level in Joint Action (JA) member states.

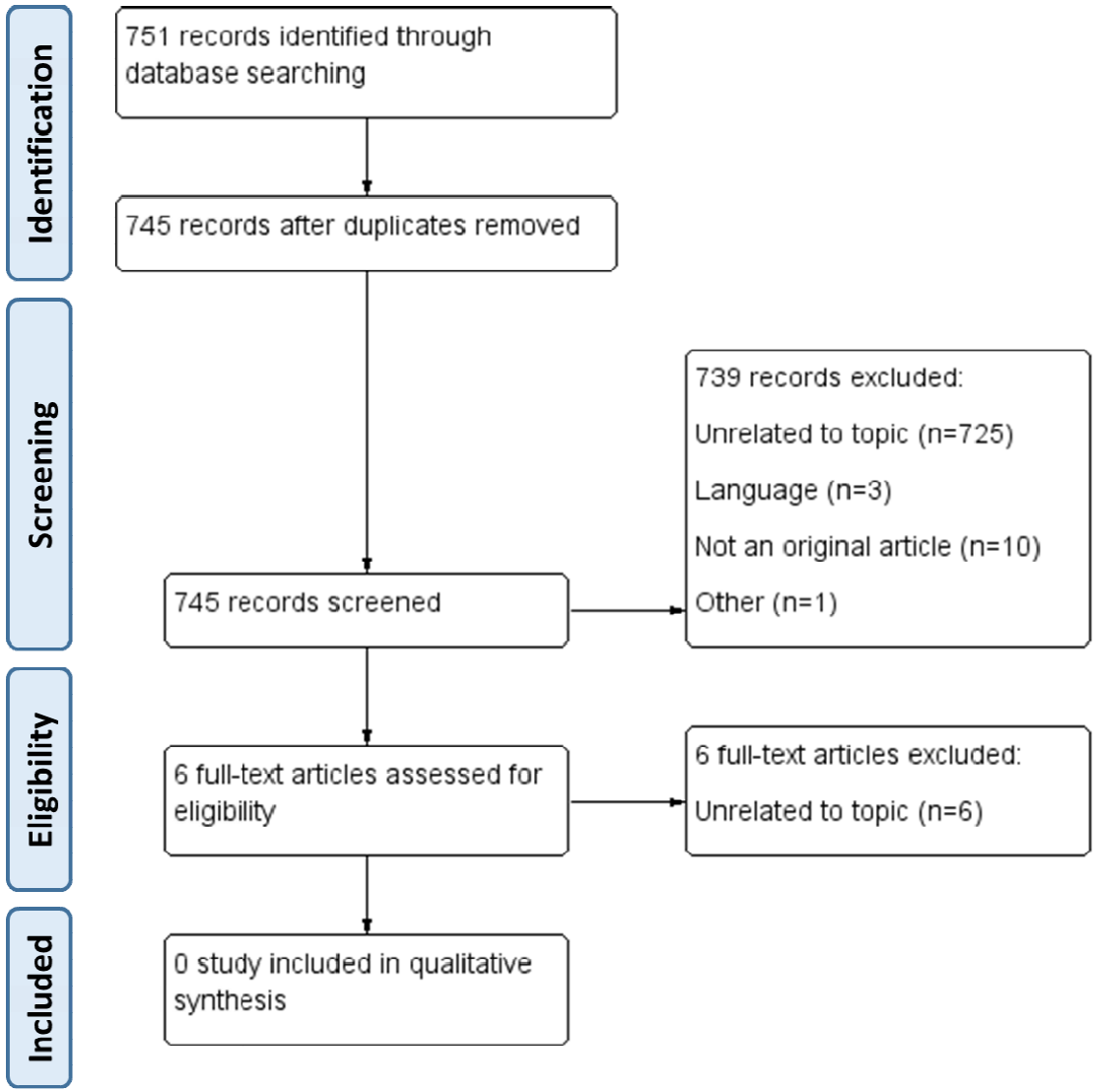

Figure 1.4. PRISMA flow diagram of the identification of eligible studies on monitoring of frailty at population level in Joint Action (JA) member states.

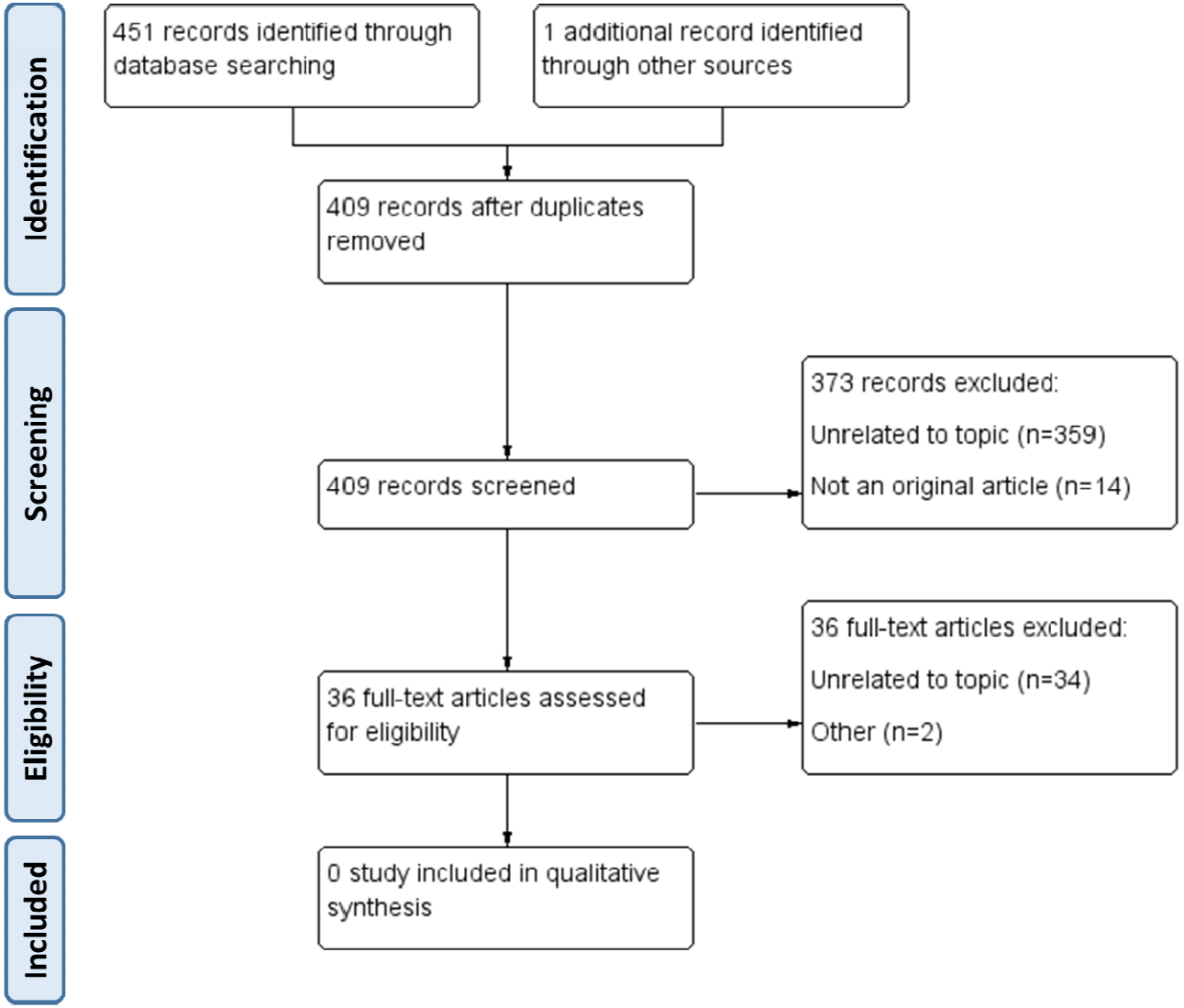

Figure 1.5. PRISMA flow diagram of the identification of eligible studies on frailty transitions/trajectories at population level in Joint Action (JA) member states.

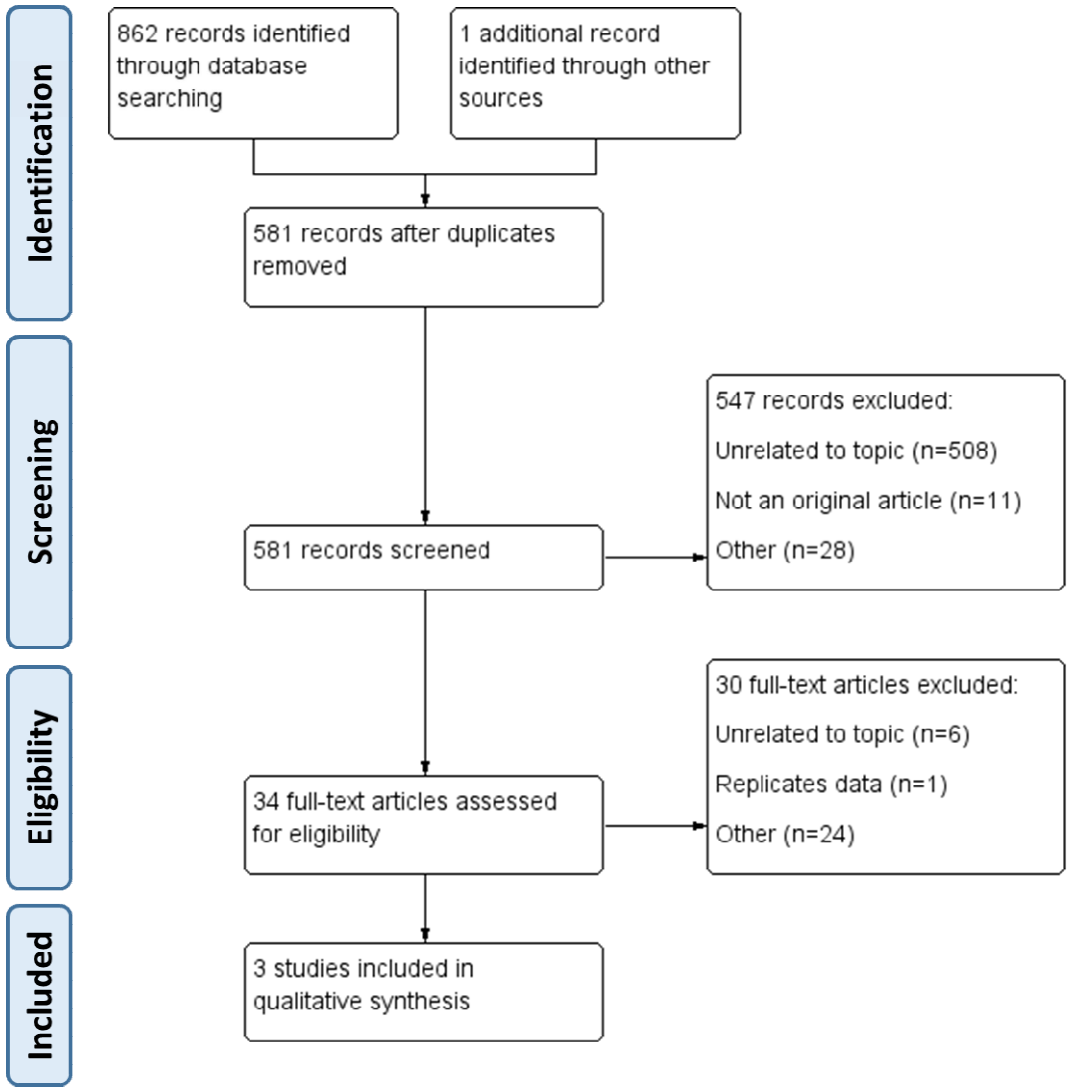

Table 1.1. Characteristics of studies reporting prevalence rates of frailty at population level in Joint Action (JA) Member States.

CHARACTERISTICS OF FRAILTY DATA AT POPULATION LEVEL GROUPED BY JOINT ACTION MEMBER STATE (WHERE AVAILABLE)

Source	Frailty Prevalence	Number of participants	Setting	Frailty definition	Age (years)	Women (%)
Austria						
Dorner et al., 2014	54.1	133	Hospital - General inpatients	SHARE FI	≥65	60.9
Santos-Eggimann et al., 2009	10.8	707	Community	SHARE FI	≥65	*Not reported*
Belgium						
Hoeck et al., 2012	9.3	4,777	Community	CHS	≥65	56
Theou et al., 2013	20.0	3,699	Community	SHARE FI	≥50	54.5
Boeckxstaens et al., 2015	7.2	567	Community	CHS	≥80	62.8
Finland						
Koponen et al., 2013	11.4	605	Community	CHS	≥75	70.1
France						
Santos-Eggimann et al., 2009	15.0	687	Community	SHARE FI	≥65	*Not reported*
Avila-Funes et al., 2008	7.0	6,078	Community	CHS	≥65	61.3
Cesari et al., 2012	2.9	523	Community	CHS	≥60	51
de Souto Barreto et al., 2012	9.8	398	Community	CHS	≥60	64.3
Soler et al., 2016	51.1	1,648	Hospital - Geriatric Clinic	CHS	≥60	64.4
Le Cossec et al., 2016	12.3	11,089	Community	CHS	≥55	54.9
Le Cossec et al., 2016	11.1	4,236	Community	CHS	≥55	57
Germany						
Santos-Eggimann et al., 2009	12.1	933	Community	SHARE FI	≥65	*Not reported*
Saum et al., 2012	8.9	3,112	Community	CHS	≥59	52.5
Dapp et al., 2014	15.8	1,679	Community	Other	≥60	62.1

Bollwein et al., 2013	15.5	206	Community	CHS	≥75	66
Buttery et al., 2015	2.6	1,843	Community	CHS	65–79	50.1
Vogt et al., 2015	4.1	954	Community	CHS	≥65	49.1
Greece						
Santos-Eggimann et al., 2009	14.7	784	Community	SHARE FI	≥65	*Not reported*
Italy						
Ble et al., 2006	6.5	827	Community	CHS	≥65	54.0
Gallucci et al., 2009	16.3	668	Community	Other	≥70	53.4
Bilotta et al., 2010	38.0	302	Hospital - Geriatric Clinic	SOF	≥65	71.0
Solfrizzi et al., 2012	7.6	2,581	Community	CHS	65–84	45.2
Forti et al., 2014	7.2	766	Community	SOF	≥65	53.4
Roppolo et al., 2015	12.7	267	Community	CHS	≥65	59.9
Veronese et al., 2016	10.0	1,754	Community	CHS	≥65	64.0
Santos-Eggimann et al., 2009	23.0	833	Community	SHARE FI	≥65	*Not reported*
Liotta et al., 2017	21.5	1,331	Community	Other	≥65	54.2
Ireland						
O'Halloran et al., 2013; Roe et al., 2016	2.0	4,858	Community	CHS	≥50	52
Ntlholang et al., 2014	32.0	257	Hospital - Geriatric Clinic / Day Hospital	SHARE FI	NA	64.8
O'Caoimh et al., 2014	54.3	784	Public Health Centres	CFS	≥65	64.0
Kelly et al., 2016	41.5	1312	Community	CFS	≥65	70.6
Theou et al., 2013	15.0	1107	Community	SHARE FI	≥50	53.7
The Netherlands						
Santos-Eggimann et al., 2009	11.3	830	Community	SHARE FI	≥65	*Not reported*
Peters et al., 2012	62.1	124	Nursing home	GFI	≥65	62.9
Van Kempen et al., 2013	24.0	141	Primary Care	Other	≥70	62.0
Metzelthin et al., 2014	36.0	1101	Primary Care	GFI	≥70	*Not reported*
Etman et al., 2014	24.8	408	Community	ISAR	≥65	52.9
Lahousse et al., 2014	5.9	2833	Community	CHS	≥55	55.9
Cramm et al., 2014	4.9	869	Community	TFI	≥70	57.1
Hoogendijk et al., 2014	10.8	1205	Community	CHS	≥65	*Not reported*
Mijnarends et al., 2015	8.4	227	Community	CHS	≥65	48.5
Op het Veld et al., 2015	8.7	8,684	Community	CHS	≥65	53.2
Reijnierse et al., 2015	28.6	299	Hospital - Geriatric Clinic	CHS	NA	66.0
Norway						

Langholz et al., 2017*	3.7	736	Community	CHS	≥65	51.4
Poland						
Matusik et al., 2012	75.6	86	Nursing home	CFS	≥65	76.7
Theou et al., 2013	42.0	2425	Community	SHARE FI	≥50	*Not reported*
Bieniek et al., 2016	54.2	325	Hospital - Geriatric Ward	CHS	NA	67.0
Portugal						
Duarte et al., 2014	60.0	50	Community	CHS	≥100	84.0
Duarte & Paul et al., 2015	34.9	339	Community	CHS	≥50	53.4
Romania						
Olaroiu et al., 2014	75.0	215	Primary Care	GFI	≥65	66.0
Spain						
Alcala et al., 2010	10.3	814	Community	CHS	≥65	51.4
Abizanda-Soler et al., 2011	16.5	993	Community	CHS	≥70	60.5
Santos-Eggimann et al., 2009	27.3	816	Community	SHARE FI	≥65	*Not reported*
Jürschik Gimenez et al., 2012	9.6	640	Community	CHS	≥75	60.3
Ferrer et al., 2014	20.5	273	Community	CHS	85	60.8
Garcia-Garcia et al., 2011	8.4	1667	Community	CHS	≥65	56.1
Garre-Olmo et al., 2013	17.3	875	Community	Other	≥75	58.2
León-Muñoz et al., 2014	4.2	1815	Community	CHS	≥60	51.3
Gonzalez-Vaca, et al., 2014	68.8	324	Nursing home	CHS	≥65	56.1
Acosta-Benito et al., 2016	17.8	146	Community	FRAIL scale	≥70	54.7
Papiol et al., 2016	29.4	126	Primary Care	CHS	≥75	47.0
UK						
Hubbard et al., 2010	9.7	3,055	Community	CHS	≥65	56.0
Syddall et al., 2010	6.3	642	Community	CHS	64–74	50.0
Bouillon et al., 2013	2.8	3895	Community	CHS	45–69	27.0
Ramsay et al., 2015	19.0	1622	Community	CHS	71-92	0
Palmer et al., 2017	3.9	8095	Primary Care	CHS	50-65	54.0

CHS – Cardiovascular Health Study (Frailty phenotype); CFS - Clinical Frailty Scale; FI - Frailty Index; SHARE FI - Survey of Health, Ageing and Retirement in Europe Frailty Index; GFI - Groningen Frailty Indicator; ISAR – Identification of Seniors at Risk tool; TFI - Tilburg Frailty Indicator
NA = Not Available

Table 1.2. Characteristics of studies reporting frailty incidence at population level in Joint Action (JA) Member States.

Source	Country	Study name	Setting	Age	Women %	Follow up length Mean years (SD)	Frailty definition	Number of participants	Inclusion criteria	Frailty Incidence
León-Muñoz et al. 2014	Spain	Seniors-ENRICA	Community	≥60	NA	3.5 (NA)	CHS	1815	No frailty at baseline	Frailty 7.5%
Stenholm et al. 2014	Finland	Mini-Finland Health Examination Survey	Community	≥30	58%	22.2 (0.82)	CHS	1119	No frailty at baseline	Pre-frailty 36% Frailty 5%
Vogt et al. 2015	Germany	KORA-Age Study	Community	≥65	49% total sample	2.9 (0.1)	CHS	727	No frailty at baseline	Pre-frailty 21.2% Frailty 3.9%

CHS = Cardiovascular Health Study phenotypic criteria; NA = Not Available

Table 1.3. Data on screening for frailty at the population level at Joint Action (JA) Member States.

Source	Region, country, setting	Number of participants	Age. Women	Sampling method and inclusion criteria	Frailty definition	Screening process	Proposed intervention	Results
van Kempen et al 2013	Nijmegen, The Nether-lands GP practices	141	Mean 77 years; SD=6 62%	Random selection of community dwelling patients >=70 from 7 GP practices	Broad definition: vulnerability based on decreased reserve capacity	Two-step: In the first step, the GP reviews the patient record assessing patients' functioning in somatic, psychological, and social domains. Patients who are judged 'frail' in the first step follow a structured assessment by a primary care nurse. The frailty decision in both steps is based on clinical reasoning, not a numerical score	Not mentioned	Frailty prevalence 24%. One-third needed the second step. Acceptable procedure for professionals and patients. Inter observer variability could be high.
Razzanelli et al 2013	Tuscany, Italy Community	Response rate to the question-naire: 57.2% (6629 respon-dents out of 11585)	>=70 years 58%	All residents over 70 years but those with recognized disability in social services databases or those who said they were disabled during the screening	No formal frailty definition. Just a search for deficits in different areas	Two-step: A postal questionnaire (Sherbrooke) followed by an in-home comprehensive assessment performed by a nurse or social worker. Areas explored in the first step were social isolation, polypharmacy, visual problems, falls, hospital admissions, cognitive and motor deficits. The second step added the assessment of IADLs, depression, malnutrition, auditory problems and environmental risk	Assessment results communicated to physicians and social services with specific recommendation for intervention	Of the respondents to the questionnaire, 51.7% were recommended to follow the second step. 66.3% were evaluated and 61.9% of them were considered autonomous. Of those, 95% had at least one problematic area and 69% at least two. Organizationally and economically acceptable intervention
CFS - Clinical Frailty Scale; FI - Frailty Index; GFI - Groningen Frailty Indicator								

Table 1.4. Characteristics of studies reporting transitions/trajectories of frailty at population level in Joint Action (JA) Member States.

Country	Number of participants	Age (Mean/ cut-off in yrs)	Women (%)	Sampling	Frailty definition	Sampling process	Results
Italy							
Trevisan et al., 2017	2925	≥65	59.7	Community based Longitudinal cohort study	Fried criteria - CHS	Randomly selected using a multistage stratified method.	Over 4.4 years of follow-up, 41.9% retained their baseline frailty status, 32.6% had a transition in their frailty status, and 25.5% died. In all, 36.4% had one frailty transition.
UK							
Rogers et al., 2017	8649	≥50	53.2	Community based Longitudinal cohort study	FI, 56 variables	Representative sample of the population aged 50 and over, living in private households in England.	Average eleven-year frailty trajectories in five-year age cohorts (50-54;55-59;60-64;65-69;70-74;75-79;80+) of non-frail adults were assessed, predicted by baseline physical activity (PA) status. Compared with the sedentary reference group, mild PA was insufficient to significantly slow the progression of frailty, moderate physical activity reduced the progression of frailty in some age groups (particularly ages 65 and above) and vigorous activity significantly reduced the trajectory of frailty.
The Netherlands							
O'Caoimh et al., 2017	169	≥65	NA	Cross sectional study	GFI	Two-step screening and assessment process	During two years of follow-up 78% of subjects remained robust, while half remained stable as pre-frail or frail. A further 25% transitioned from either frail to pre-frail and from pre-frail to robust. In all, 20% converted from pre-frailty to established frailty over two years (2014-16). In all, 34.3% had one frailty transition.

CFS - Clinical Frailty Scale; CHS - Cardiovascular Health Study; FI - Frailty Index; GFI - Groningen Frailty Indicator
NA = Not Available

ANNEX 4. GOOD PRACTICE INITIATIVES, EUROPEAN PROJECTS ON FRAILTY AND GREY LITERATURE AT POPULATION LEVEL

Table 2 Characteristics of search results for good practice initiatives, ongoing, European Union (EU)-funded trial data and grey literature relevant to the Joint Action (JA) on Frailty Prevention

Type of data	Name of activity	Details of activity	Lessons for ADVANTAGE including sample, outcomes & data available	JA Members (References) Coordinating Centre in Bold
Good Practice Initiatives	The Community Assessment of Risk & Treatment Strategies (CARTS) project	Integrated care pathway for community-dwelling older adults designed to screen for and prevent frailty – 2011-2017. Developed as a good practice initiative under the A3 Action Plan of the European Innovation Partnership on Active and Health Ageing.	Frailty was screened using a two-step screening and comprehensive assessment process. Screening was conducted with the Rockwood Clinical Frailty Scale and RISC stratification instrument among those ≥65 attending public health centres. 803 screened at baseline in Ireland, 53.4% frail. In Portugal, 4,499 were screened, results awaited. In Spain, 374 screened, 19.3 % high risk of adverse outcomes. This study represents a two-step frailty screening and assessment model with the potential to be up-scaled in different settings and JA countries though more evidence is required.	Ireland, Spain, Portugal (O'Caoimh et al, International Conference on Information and Communication Technologies for Ageing Well and e-Health 2015 Springer 3-18).
	Electronic Frailty Index (eFI)	NHS England requires that all primary care practices routinely identify moderate and severe frailty in patients aged ≥65 years – using an appropriate screening instrument such as the eFI	Mandating routine identification of frailty through the use of existing health records can improve the recording and recognition of frailty as a diagnosis. Use of an electronic frailty screen improves time efficiency and accuracy without imposing additional burden on healthcare professionals. Identification will trigger a clinical review and may provide a vehicle to target care.	UK (Clegg et al., 2016)
	Impact of a Community-based Program on Prevention and Mitigation of Frailty (ICP – PMF)	Synergy initiative supported by the A3 Action Plan of the European Innovation Partnership on Active and Health Ageing Task Force on Synergies.	Data from several on-going and completed European projects will be analysed. The incidence of frailty among community-dwelling older adults ≥65 in each of the contributor sites will be assessed. Preliminary data from 258 subjects screened with SFGE suggests that 28% are pre-frail and 27.8% are frail. This project will provide useful, practical data in real world settings across a representative population-based sample in several EU JA member states.	Italy, Spain, Portugal, Ireland, Hungary, Austria (Liotta et al., Translational Medicine @ UniSa, 2016)
EU Funded Projects	The Personalised ICT Supported Service for Independent Living and Active Ageing (PERSSILAA) Study	FP-7 Funded trial – 2013-2016. Development of a comprehensive information and communication technology supported platform to screen, assess, manage and monitor pre-frail community-dwelling older adults in order to address frailty by targeting pre-frailty and promoting active and healthy ageing.	Frailty and pre-frailty were screened in community dwellers aged ≥65 using the Groningen Frailty Indicator (GFI) as part of a two-step screening process. 4,071 self-screened in the Netherlands identified through primary care. 17.5% screened as frail, 23.3% as pre-frail. Frailty transitions were identified for 169 subjects with data at baseline and 25% transitioned from frail to pre-frail and from pre-frail to robust. 20% converted from pre-frailty to established frailty over two years. 42 healthcare recommendations were made including guidance on screening for frailty and pre-frailty in the EU. This project highlights the potential of developing self-screening pathways for the early and resource sensitive screening of older adults using traditional and ICT-based strategies. The utility of two-step screening and assessment is highlighted.	Netherlands, Italy, Spain, Portugal, Ireland (O'Caoimh et al., Proceedings of the 3rd International Conference on Information and Communication Technologies for Ageing Well and e Health 2017) www.perssilaa.eu
	FRAILCLINIC	The project will assess the feasibility and effectiveness of programmes designed to detect and manage frail older patients in high-risk hospital clinical settings.	The highest prevalence of frailty is detecting in emergency departments (60%), the lowest was on surgical wards (21%). Preliminary data suggests that the Fried Frailty Phenotype is the least suitable approach in hospital settings. The Groningen Frailty Indicator (GFI) classifies more subjects as frail than other scales.	Spain, Italy, UK www.frailclinic.eu

			This project will improve knowledge of frailty prevalence in the acute setting in several EU JA member countries.	
	Frailty Management Optimization through EIP AHA Commitments and Utilization of Stakeholders input (FOCUS) project	DG SANCO—3rd European Union Health Programme funded trial – 2014-2020. The aim is to consolidate the available evidence on screening and interventions for frailty and pre-frailty, to aid the implementation and scalability of suitable interventions	The trial is ongoing developing methods and tools to assist entities focusing on early diagnosis, screening and management of frailty to achieve scalability. This project will summarize existing data and the evidence for frailty screening pathways and their scalability. Qualitative evidence on acceptability will also be available.	Spain, Poland, Italy, Portugal, UK, the Netherlands (Cano et al., Fam Med Prim Care Rev 2016) www.focus-aha.eu
	SUNFRAIL	DG SANCO—3rd European Union Health Programme funded trial – 2014-2020. Reference Sites Network for Prevention and Care of Frailty and Chronic Conditions in community dwellers living in EU Countries. 30-month European project that began in May 2015.	Goal is to improve the detection, prevention and management of frailty. The project will focus on the development of integrated care for frailty management including the development of screening and assessment strategies. SUNFRAIL will develop the evidence base for methods to screen frailty and monitor the effect of interventions to mitigate frailty in several JA member states.	Italy, Poland, France, UK (Northern Ireland) www.sunfrail.eu
	Frail Tools Study	DG SANCO—3rd European Union Health Programme funded trial – 2014-2020. A validation of instruments to screen and diagnose frailty in different clinical settings to validate and compare instruments to support the integrated care of frail older adults.	As consecutive older adults ≥65 will be recruited prevalence data in different settings is expected: Hospital Geriatric wards, hospital outpatient clinics, primary care and nursing homes. Subjects will be followed for 18 months. This study will add to the data on frailty prevalence in specific settings not traditionally captured in longitudinal community-based projects.	Spain, Italy, France, UK, Poland www.frailtools.eu
Grey Literature	Documento de consenso sobre prevención de fragilidad y caídas en la persona mayor. Estrategia de Promoción de la Salud y Prevención en el SNS	Consensus statement & action plan on screening and managing frailty among older adults in Spain published by the Spanish Ministry of Health – 2014-2020.	Details the development of a common basic protocol to screen for frailty in primary care in Spain through (1) organised opportunistic screening for community dwellers aged ≥70, attending primary care using the Short Physical Performance Battery (SPPB) & (2) active screening through established integrated care programmes. Tailored interventions will be offered. These guidelines are useful in demonstrating a coordinated action plan to screen frailty and monitor for frailty after intervention in an EU JA country. This could be used as a template that could be adopted by other member states.	Spain
	Austrian interdisciplinary study on the oldest old (ÖIHS) study	Thus study investigates the health, living conditions and support situation of older adults in Austria.	Data from 410 individuals ≥80 collected between 2013 to 2014 in Vienna and Styria was collected. Nearly half of the study participants are frail. This on-going study will assist in understanding the prevalence of frailty in the 'oldest old' population in Austria, where current data is mainly derived from the SHARE study.	Austria www.oepia.at
	Health examination for people over 65 years old	Developed by the Spanish/Andalusian Regional Ministry of Health (CSJA), this project started in 2006. The exam is a specific initiative seeking to facilitate early detection of frailty in older adults. It is focused on primary care.	To date, Population ≥65 included in the program in 2012 is 809, 695 increasing to 839,948 in 2015. Currently, it is being revised to update it according to the available scientific evidence and to allow continuity with other public services. This population-based approach to screening and managing/monitoring frailty at population-level in a large coordinated region in a single JA member state could be up-scaled as a template that could, if expected results are favourable,	Spain

			be replicated in other JA countries.	