D. 2 Report

generic template

UHCE

Work package 4

Juli 2015

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Content

1. From the proposal

In this project, innovative Urban Health Centers 2.0 (UHC2.0) will integrate health and social care, preferably in one location. Here, older citizens and patients will be put at the center of care in their neighborhoods. A population-oriented, pro-active approach will be applied, instead of mainly handling symptoms and diseases. Currently, health professionals, especially physicians, are often burdened by the increasing workload and have ample time for a structured population-oriented, preventive approach. Therefore, in UHC2.0 nurse practitioners and physician assistants will provide standardized preventive care, and will monitor and facilitate integrated care pathways. The nurses/assistants will pro-actively assess frailty in the houses of the patients, while observing (self) medication and fall risks. Together with the patient (and relatives) the physician will aim for a shared decision on an integrated (social and health) care pathway that will include management of polypharmacy and prevention of falls. This project will demonstrate a new path of collaboration between professionals with use of available ICT technology. In UHC2.0, older citizens and innovative care providers co-create integrated health and social care pathways, a proactive approach to frailty, management of polypharmacy, and prevention of falls.

A generic European UHC2.0 template will be developed. UHC2.0 will be characterized by
(a) integrated health and social care in the community,
(b) a population oriented approach with a focus on anticipatory care, and
(c) the deployment of nurse practitioners/physician assistants to provide standardized care. Existing evidence-based protocols will be integrated in UHC2.0 (early detection of frailty, integrated care pathways, management of polypharmacy, and prevention of falls, supported by available ICT tools). The generic UHC2.0 template will be adapted to the local preferences/context.

2. Methods

Within work-package 4 a generic template was developed, including an assessment, shared decision making, and multiple care pathways. In order to develop the generic template, different steps were taken (Figure 1).

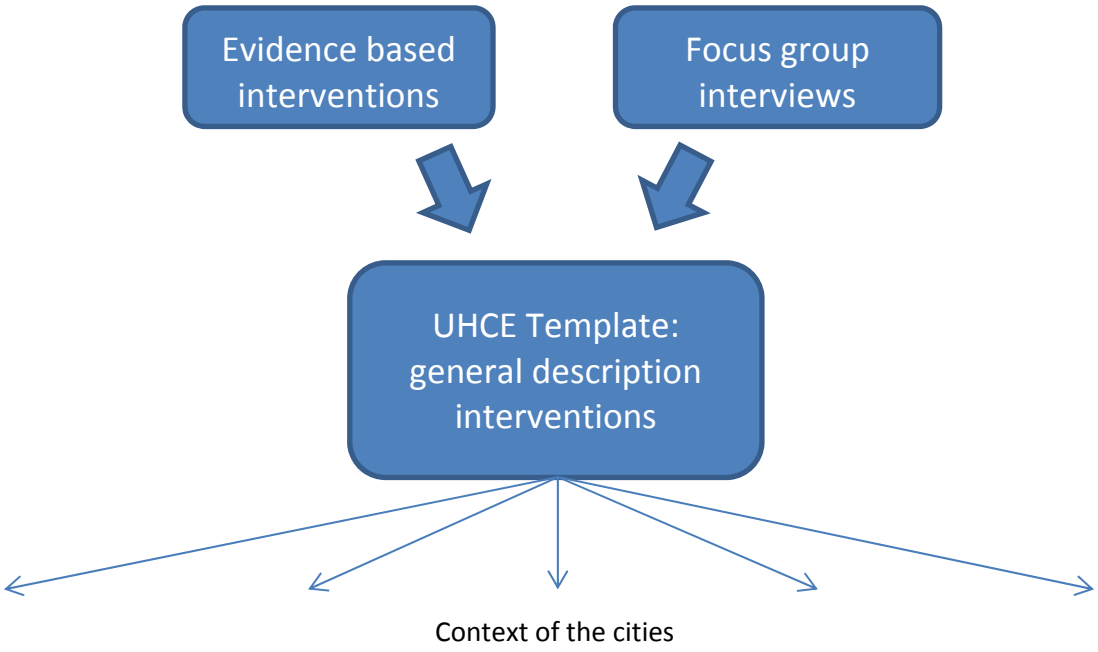
First, knowledge about evidence based interventions, regarding management of polypharmacy, prevention of falls and detection of frailty, were synthesised using systematic reviews.

Second, focus group interviews were performed in the five pilot cities to assess preferences and demands of different stakeholders.

Third, a general description of the interventions within the different care pathways were conducted.

Finally, the generic template was translated to the local situation of the five pilot cities.

Figure 1 Development UHCE template



2.1. Evidence based interventions

A literature search on systematic reviews was performed to identify evidence based interventions on management of polypharmacy, fall prevention, and frailty. The topic frailty was specified into loneliness, cognition, and depression.

Cochrane reviews were searched for evidence based interventions. In addition, systematic reviews were search in PubMed if limited Cochrane reviews were available.

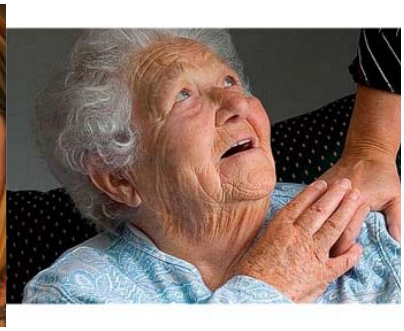
2.2. Focus group interviews

Focus group interviews were conducted in five European cities, namely Manchester, Pallini, Rotterdam, Rijeka, and Valencia. The focus group interviews were performed in order to explore the demands and preferences of elderly, professionals, informal care givers, and managers and/or policy makers.

A focus group interview is a well-tested method for collecting qualitative research data through carefully planned group discussions with the purpose of obtaining perceptions of participants in a permissive and non−threatening environment. The discussions were conducted by a skilled moderator and assistant moderator, supported by a predetermined set of images and questions.

The focus group interviews started with a short mood film followed by talking about topics that were important to the participants with the help of images. The participants received 10 images related to ageing and care. Each participants was asked to select three images that were important to them. Each participants was invited to talk about the selected images. Each session of 90 minutes was divided into four parts;

1. Introduction: (10 min)
2. Needs and expectations (60 min)
3. eeds and expectations in the future (15 min)
4. Focus group evaluation


In each of the five European pilot cities, two focus group interviews with each 6-10 older citizens; two groups with 6-10 social and health care professionals; and two groups with 6-10 other stakeholders (volunteers, family and friends) were organised. Policy makers and managers were interviewed individually. The focus group interviews were performed in the neighbourhoods where the intervention will take place as well as the comparable 'control' neighbourhoods. The focus group interviews were audio-recorded, transcribed, and translated into English.

Data analyses

The data was analysed using a narrative approach on group level of the stakeholders. A process of thematic analysis was applied, themes were derived from the data. Special attention was paid to themes on which many time was spend or that were mentioned often, i.e. frequency and extensiveness of themes.

First, all the transcripts were entirely read in order to explore the data. One researcher (RM) applied thematic analysis in order to detect codes. Second, key themes were identified. Data of a focus group session was constantly compared with data of other focus group sessions.

3. Results

3.1. Evidence based interventions

Evidence based interventions were searched for fall prevention, management of polypharmacy, loneliness, depression, and cognition.

3.1.1. Fall prevention

Four Cochrane review were found regarding interventions for fall prevention [1-4]. Evidence has been found for home-based exercise programmes, group exercise programmes, and multifactorial assessment and intervention programmes for reducing rate of falls and/or risk of falling [1].

Gillepsie et al. (2012) concluded that multifactorial assessment and intervention programmes reduce rate of falls, group exercise and homes based exercise reduce rate of falls and risk of falling and Tai Chi reduces risk of falling. The group exercise and home-based exercise programmes should contain two or more categories of exercise, namely gait/balance/functional training, strength/resistance training, flexibility, 3D (like Tai Chi and dance), general physical activity, and endurance [1].

With respect to home safety programmes, Gillepsie et al. (2012) conclude that they reduce rate of falls and risk of falling [1]. However, Turner et al. (2011) that there is insufficient evidence to determine whether interventions focused on modifying environmental home hazards solely reduce injuries [4]. According to veiligheidNL, a multifactorial approach is most effective in reducing risk of falling. The programme contains at least an exercise programme, combined with control of medication, and/or vitamin D, and/or improvement of vision, and/or home safety adjustments, and/or living environment.

There is weak evidence that some types of exercise, like gait, balance, co-ordination and functional tasks, strengthening exercise, 3Dexercise, and multiple exercise types, are moderately effective in improving clinical balance outcomes immediately post intervention [2].

Vision improvement, psychological interventions (cognitive behavioural), fluid or nutrition therapy, Knowledge/education interventions, and vitamin D supplementation appear to be not effective in reducing rate of falls and risk of falling [1]. There is also little to no effect in reducing the risk of hip fractures in community setting. Hip protectors probably reduce the risk of hip fractures if made available to older people in nursing care or residential care settings, without increasing the frequency of falls. However, hip protectors may slightly increase the small risk of pelvic fractures. Poor acceptance and adherence by older people offered hip protectors is a barrier to their use [3].

3.1.2. Polypharmacy

For polypharmacy evidence based interventions were searched regarding to appropriate prescribing as well as adherence. In total, two Cochrane reviews, one systematic review, and a multidisciplinary guideline polypharmacy were found [5-8].

3.1.2.1. Appropriate prescribing

Multifaceted pharmaceutical care appear to be beneficial in in terms of reducing inappropriate prescribing and medication-related problems [6, 8].

Screenings tools to reduce inappropriate prescribing, such as STOPP (Screening Tool of Older Person's Prescriptions) and START (Screening Tool to Alert doctors to Right Treatment) criteria [5, 9] are recommended by the multidisciplinary guideline Polypharmacy [5]. The START/STOPP criteria appear to be most suitable to support medication treatment for elderly with multimorbidity [5].

There is sufficient evidence that computerized decision-making support systems are modestly but significantly effective in reducing inappropriate prescribing and adverse drug events [8]

3.1.2.2. Adherence

Medicines self-monitoring and self-management programmes appear generally effective to improve medicines use and adherence [7]. Other promising interventions to improve adherence include simplified dosing regimens, interventions involving pharmacists in medicines management, such as medicines reviews and pharmaceutical care services (consultation between pharmacist and patient to resolve medicines problems, develop a care plan and provide follow-up) [8].

Successful interventions for patients with multiple conditions and polypharmacy include structured medication review, medication regimen simplification, administration aids and medication reminders, but no firm conclusion in favour of any particular intervention could be made [8].

3.1.3. Loneliness

Five reviews, of which three were systematic reviews and one meta-analysis, were found regarding interventions for loneliness [10-14].

It appeared that common characteristics of interventions likely to be effective were those developed within the context of a theoretical basis, and those offering social activity and/or support within a group format [10, 11]. Nine of the ten effective interventions were group activities with an educational or support input [10]. The review suggests that educational and social activity group

interventions that target specific groups, such as women, care-givers, the widowed or the physically inactive, can alleviate social isolation and loneliness among older people [10].

Interventions in which older people are active participants involving social contact also appeared more likely to be effective. It seems that programmes in which older people are active participants involving social contact and enable older people to be involved in planning, developing and delivering activities are most likely to be effective [11]. Moreover, Findlay et al. hypothesised that group interventions were more likely to be effective if they were at least five months in duration [12]. Examples of social activities within a group are psychosocial group nursing, inc art & inspiring activities, exercise & discussions, therapeutic writing & group therapy, activity group including a mutual help network and leisure/cultural group activities, and picture book reading to children [10, 11]. The results of the meta-analyses suggests that correcting maladaptive social cognition offers the best chance for reducing loneliness among elderly [14].

Smart technologies, such as interactive, online program that incorporated health information, support groups, chat rooms or discussion boards, may help older people better manage and understand various health conditions, resulting in subsequent improvements in aspects of social connectedness. Further research is required regarding how technological innovations could be promoted, marketed and implemented to benefit older people [15]. Hagan et al. mentioned that the highlight of their review was that three of the four interventions demonstrated measurable effect on reducing loneliness amongst older people involved introducing new technologies. It may not be generalized to a larger population, since these studies reported relatively small numbers, however these investigations do highlight the need for further research to be conducted in this particular area [13].

Internet training, one-to-one intervention (home visiting), and time limited group interventions (6-12 weeks) appear to have no effect on loneliness among elderly [10, 11, 13].

3.1.4. Cognition

Two Cochrane reviews and two systematic reviews were found regarding interventions to improve cognitive functions [16-19].

The results of the systematic review of Law et al., that identified eight studies, showed that combined cognitive and exercise training can be effective for improving the cognitive functions and functional status of older adults with and without [18].

The current evidence suggests that physical activity may help to improve cognitive function and, consequently, delay the progression of cognitive impairment in the elderly. However, according to Carvalho et al., the majority of the evidence is of medium quality with a moderate risk of bias and

larger randomized controlled trials are needed to clarify the association between exercise and cognitive function and to determine which type of exercise have the greatest benefit [17].

There is currently little evidence on the effectiveness of memory interventions for healthy older adults and individuals with mild cognitive impairment. The memory interventions lead to performance gains, however none of the effects could be attributable specifically to cognitive training, since the improvements did not exceed the improvement in active control conditions [19].

The review of Angevaren et al. included eleven studies assessing the effectiveness of physical activity on cognitive function in older people without known cognitive impairment. There is evidence that aerobic physical activities are beneficial for cognitive function in healthy older adults, with effects observed for motor function, cognitive speed, auditory and visual attention. However, the cognitive functions which improved were not the same in each study and the majority of comparisons yielded no significant results [16].

3.1.5. Depression

Six Cochrane reviews, seven systematic reviews, and a Dutch guideline of depression among older adults were found regarding interventions to decrease symptoms of depression [20-33].

The Coping with depression (CWD) can be adapted for prevention, treatment, and relapse prevention. The CWD is effective in the prevention of new cases of major depressive disorders and effective in the treatment of an existing depression. However, the overall effect size was considerably smaller than the effect sizes found for psychotherapies for adult depression [23].

Psychological therapies in general are effective in late-life depression [22, 24]. According to Cuijpers et al. (2014), this is especially well-established for cognitive behavior therapy and problem-solving therapy [22]. On the other hand, Wilson et al. (2009) concluded, based on seven small studies, that the findings do not provide strong support for psychotherapeutic treatments in the management of depression of elderly [31].

Psychotherapy has small to moderate improvement in social functioning. These improvements are strongly associated with, but not fully explained by, improvements in depressive symptoms [27].

Antidepressants, such as tricyclic antidepressants (TCA), selective serotonin reuptake inhibitors (SSRI), and monoamine oxidase inhibitors and related antidepressants (MAOI), proved effective in the treatment of depression of elderly. At least six weeks of antidepressant treatment is recommended to achieve an optimal therapeutic result. Low dose TCA treatment may be effective, however, further research is required [30]. Some evidence has been found suggesting that TCA

related antidepressants and classical TCAs have different side effect when compared with SSRIs. The classical TCAs are associated with a higher withdrawal rate due to side effect experience, although these results must be interpreted with caution due to the heterogeneity of the drugs and patient populations [25]. The long-term benefits of continuing antidepressant medication in the prevention of recurrence of depression in elderly are not clear [29].

Research has shown that both pharmacological and psychological therapies can be effective in treatment of depression. However, many people prefer to try an alternative treatment. Exercise or physical activity appear to reduce (severity of) symptoms of depression [20, 21, 26, 33]. Cooney et al. concluded, based on a few small trails, that appear to no more effective than psychological or pharmacological therapies [21].
Another alternative of pharmacological treatment is electroconvulsive therapy (ECT). The review of van der Wurff et al. (2003) assessed the efficacy and safety of ECT compared to antidepressants in depressed elderly. They could not draw firm conclusions, since only four trials with serious methodological problems were found [28].

According to the Dutch guidelines of depression in older adults, elderly with mild to moderate depression should be treated with minimal interventions, like physical therapy, coping with depression, and lifestyle advises. If there are inadequate results, antidepressants medication or psychological therapy should be considered (dependent of preference of patient and availability of interventions). It is recommended to start with antidepressants medication in case of severe or psychotic depression [32].

3.2. Focus group interviews

From March 2014 till March 2015, 23 focus group interviews with professionals (9), informal caregivers (5) and elderly (9) were executed in Rijeka, Manchester, Pallini, Valencia, and Rotterdam. Moreover, 10 politicians were interviewed. In total, 140 participants in five cities where asked to tell about their demands and preferences regarding healthy ageing. The results of the analyses per stakeholder is presented below.

3.2.1.1. Elderly

Nine focus group interviews were performed with elderly. In total, 60 elderly talked about the chosen pictures. The images that were chosen most often, were related to family, being active, and risk of falling.

Family

The image of the woman with the child was chosen most often. "*My granddaughter comes first, that is an overwhelming love and a strong emotional connection; and then certainly this picture".* The elderly spoke about the importance of having a family and receiving love and understanding. *"I could not decide ... I sorted out three things and it was hard to decide. Definitely, love is the creator of everything, without love we would not be here, no, we would say 'we do not care about poor people". "Yeah family yeah, love from your family, well I suppose loving each other, same thing, and as I say money as well, yeah very important".*

The labels in the transcripts were family, my children, love, family network, partner, and need our help now.

Risk of falling

Besides family values most of the elderly talk about falling. *"Well, I suffer from dizziness and I have no trouble going up, but going down…it's impossible, I must have someone next to me, but I am active". "It was rather a bad fall but the reason for falling was ridiculous. I was trying to catch a chicken but instead I fell. I also had experience form falling when I was walking in the street, completely out of the blue"!*

Being active, exercise

The elderly were aware of the relevance of being active. *"I am still active in sports, where I used to be relatively good, and today it works for personal satisfaction. I love skiing, too" and "I think it is important that your head works properly, and that here and there one is physically active."*

More than once the participants saw a relation between risk of falling and exercise. Participant: *"Well, that too. If someone is physically active, of course, there will be less falls ... which is one cause, and the second is when we are not careful. I fell once, too, I was lucky that I did not break my neck and ended up in a wheelchair".*

Other themes

The elderly talked about several other themes. They also talked a lot about money. *"And the third thing is the food, how is a pensioner on such pension payment supposed to pay all his obligations and buy healthy food that is more expensive than any other diet"* and *"What can you do with a 500 € pension? I can't take care of a woman with this money".* The elderly talked about the rising costs of medication and wanting to go to family. *"Money maybe is not the most important thing but helps a lot, and I am not talking as if we wanted to be rich, just that we can meet the minimum needs, at this time there is people who have better pensions and there are those who have worse ones but…I don't have a bad pension, but…at the end of the month I run out…" "Or you have used all the pills that are reimbursable per month. If you need to take more or some other that are not on the positive list, you have to pay out of pocket. We don't have enough money to buy our pills, so we die eventually"!* Issues related to money were discussed more often in Spain and Greece than in the Netherlands.

The image with different medications was frequently selected as well. The reasons were very different. Besides the fear of death, the elderly discussed the lack of information regarding to medication. *"Taken a lot of pills and not knowing how they work". "For now as they have treated us well… regardless the medication you need "this" cannot be prescribed as it is not included anymore in the social security". Then you have to spend your money "Must I take it?", "Sure, but you must buy it".*

The elderly talked about loneliness. Not only loneliness they experienced themselves, but also loneliness in general. *"I have chosen this on because I think it reflects the loneliness of the elderly, because I find very hard these situations that can occur and indeed are happening". "think loneliness (refers to the picture)… it is as if she were watching a family member through the internet, and with that the woman was consoled, so I think that loneliness in older people is what hurts, I think…I have many children ... but I do not know what I will find…I tried to do… so love them and give them that ... and feel welcomed and loved… I wouldn't like being taken as a useless thing. Then I have selected*

this picture which has impressed me…HELP, and she is a young woman but when I have seen it I felt…" "As far as loneliness is concerned, every elderly person is worried about loneliness at old age."

Finally, the elderly are using the internet increasingly for skype and email for example. *"Yes, I like to play chess. When I play against the computer I still have the impression that I am playing with a stranger. I use the Internet and Skype, I am not interested in Facebook, but as a tool to stay in contact with others it is very handsome". "When you exaggerate with drugs it is just like when you drink too much brandy. Yesterday I downloaded an article about the sun from the Internet, written by a well-known journalist. The topic is lies about the sun. You are from the Medical Faculty and I would like to know what you think. He says, that everyone knows that the Sun is dangerous, but he says that this is because we are supposed to have a vitamin D deficiency. People do not get sick from skin cancer due to the Sun, but of the suntan creams they put on against the Sun. It is written on five pages".*

Overall, polypharmacy, risk of falling, and loneliness were important topics in all the five cities. Besides, being loved, money, and family are important to the elderly as well. The elderly in 2015 use the computer to skype, mail, and search for information. The elderly are changing and more demanding, know what they want and seem more empowered.

3.2.1.2. Informal caregivers

Five focus group interviews were performed with elderly. In total, 23 informal caregivers talked about the chosen pictures. A lot of the informal caregivers talked about their own situation instead of their experience as an informal caregiver of a family member, friend of neighbor. The images that were chosen most often, were related to worries, help and need for a professional.

Worries

The image of the man worrying was one of the images that was chosen most often. *"I shall describe only the following situation: a person with a stick gets on the bus, barely walking, carrying things*

from the market. Nobody is moving, and mostly young people are sitting. No one stands up, no one helps. The feeling is terrible that you are in an age when no one takes any notice of you, you have the impression that you simply are no longer a human being. They will rather notice a pet".

One participant called it the sandwich generation; *"I think that's a real challenge. I think that's a very good point in old age stress and loneliness they go hand in hand because of the demand life we live everybody has a loved one everybody has a child or somebody who cares but because life has become so demanding now that the youngsters are struggling to cope up with their own expectations from the society and sometimes elder ones are left alone and that can result to a bit of stress".*

Help!

The informal caregivers mentioned the need for help *"And when he has a crisis, we have a problem, because our friends are from the same region, and nobody has a car and cannot help us, because they are alone, too". "Sickness has no working hours, no Christmas, no bank holidays, no Easter".*

The informal caregivers need help, they burn out. *"There are no more neighbors. I do not live in a skyscraper, but in a building with eight flats. Nobody talks to anybody, nobody knows the other neighbors. When someone dies, not even obituaries are being hung out on the front door. This is I think a big problem". "Everyday things get worse. Problems accumulate; people cut their medication and other important things. We don't even receive a 500 € pension. We have been completely incapacitated by the cuts in pensions and salaries".*

Need for a professional

Informal caregivers need professionals to help them. Mostly regarding to the need of information. *"Someone who comes… Someone… Someone who help us, who can also give us certain guidelines*

that we don't know, but someone must come, but someone must come, because they are professionals. They must be professionals who come, maybe also the social work students, they can come to see what they are going to find later. That's it, a social worker, a professional, someone who knows about…but a professional. Because, who is going to teach you?
Someone came to my home and explained me some guidelines at physical level, but there are other kind of things that should be explained by a social worker, at least for my case.
I was taking care of my aunt who had has brain surgery at 73 years old and she is fine but I also take care of her…and you say to yourself. I would like that someone explains me what to do, how to do it, how to stand them up…or hold them… because often we rely on intuition, about food or whatever. A series of guidelines, someone should come and teach us and help us and moreover there would be some jobs created. They do not need to be volunteers, these must be people who are paid for it, who are engaged in that, as a builder is engaged in building, a professional who knows about and teaches you how you have to assist, but in everything, even how to cut nails..."

Informal caregivers have a lot of experience in taking care of their loved ones. They can't do that entirely by themselves. They need help from professionals and require information. The group of informal caregivers are more important at the moment, the society is relying more on them. There is a shift from professional care to informal care. Besides the role of informal caregiver, they also talk about there one worries and getting older.

3.2.1.3. Professionals

Nine focus group interviews were performed with elderly. In total, 47 professionals talked about their own experience and how it is to be a professional in Europe.
The images that were chosen most often, were related to loneliness, help, and care and cure.

Loneliness

Loneliness is an European problem recognized in most of the focus groups. *"Yes, yes, loneliness and isolation, because you can be accompanied but feel alone. If you have people around but… if you*

don't participate, if you feel alone…". "What we should do is analyze the loneliness causes. Is this woman alone because she has no family or because the family is ignoring her? I mean that sometimes the solution is not a social solution, is goes beyond that. Does the family take care of her or not? So the process is not just to have more Day Centers because she could also feel alone in a day center surrounded by people". "Unfortunately, there are people living in the flats whom we do not visit, because no one came to inform us that they exist". "Today we are fighting against isolation of the elderly. We want them to be functional, creative and socially integrated. Not to be isolated in a house, in a room".

Help!

Professionals also talked about their work. Doing a lot of paperwork or being educated. *"Well it would make it much easier for us, for example this morning I have provided home care and now I will spend more than one hour writing about it… so if I had a tablet I could save a lot of time. If I had an app that showed me the nearby homes, I could pass by there and I check… because it would facilitate, many things could be done".*

There is a huge information gab in collaboration between professionals. They are working more hours and have a higher workload. Professionals addressed the fact that taking care of the elderly is hard and that the level of emotional attachment to the elderly is also important.

Care and cure

The professionals mentioned several causes that influences the care and cure of the elderly. Taking care of elderly is complex according to the professionals. *"So is communication between communities and GP's, big tertiary centres like Wythenshawe. I think communication can fail us but at the same time working together as a team we can always sort stuff and I have a lot of team where I work and we always support each other and we have some patient which we feel needs two people in there with them we will provide that for them in that aspect". "Health and social care professionals need to support carers. Apart from guidelines carers receive from the doctors, they need psychological support because a carer that cares for an elderly suffering from dementia burns*

out". "I know at the other end who are always ill with the slightest aches and pain but a lot of people who I come into contact with think they will be alright and it is just getting old, it's just one of them things, I've felt worse. They won't ask for help when they might actually need it and if they got help earlier".

Professionals recognized the increasing amount of elderly and their needs. Besides the higher level of emotional attachment, professionals mentioned that the care is more time demanding. The care of elderly also need a different approach according to professionals. The use of informal caregivers and providing integrated care are examples of that.

3.2.1.4. Policymakers

In total, 10 politicians were interviewed in Rijeka, Manchester, Pallini, and Valencia. The policymakers were looking at the elderly from a politician perspective. *"The care for the elderly is a reflection of the society in which they live. A state that does not care about its elderly is actually a completely undeveloped country, full of problems, otherwise they would, like the rest of the developed world, have an elaborated system of care for the elderly". "They see that things in the city are changing, that we are trying to influence the environment to be friendly towards them and provide support through the social programme. So the elderly suffered no consequences regarding the reduced budget".*

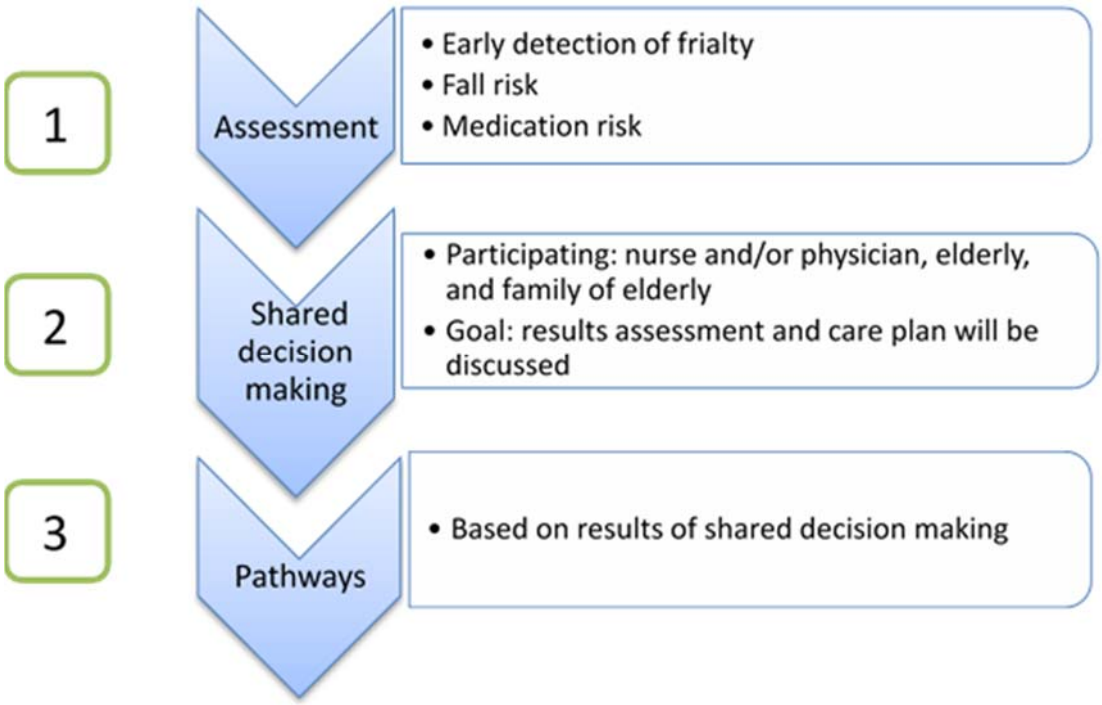
The elderly are on the agenda of the politicians. There is an awareness of the increasing group of elderly and their needs. *"Our goal was to provide the conditions that older people need to be able to lead a long, healthy and active life. We called the Strategy "Rijeka, where the elderly swim upstream" and we expect our senior citizens to participate in these activities for the next four years".*

In the interviews the politicians were les concrete about how they are going to meet the needs of the elderly.

4. The generic template UHCE

The generic template contains an assessment, shared decision making and multiple care pathways (see figure 2).

Figure 2 The different steps within the intervention group



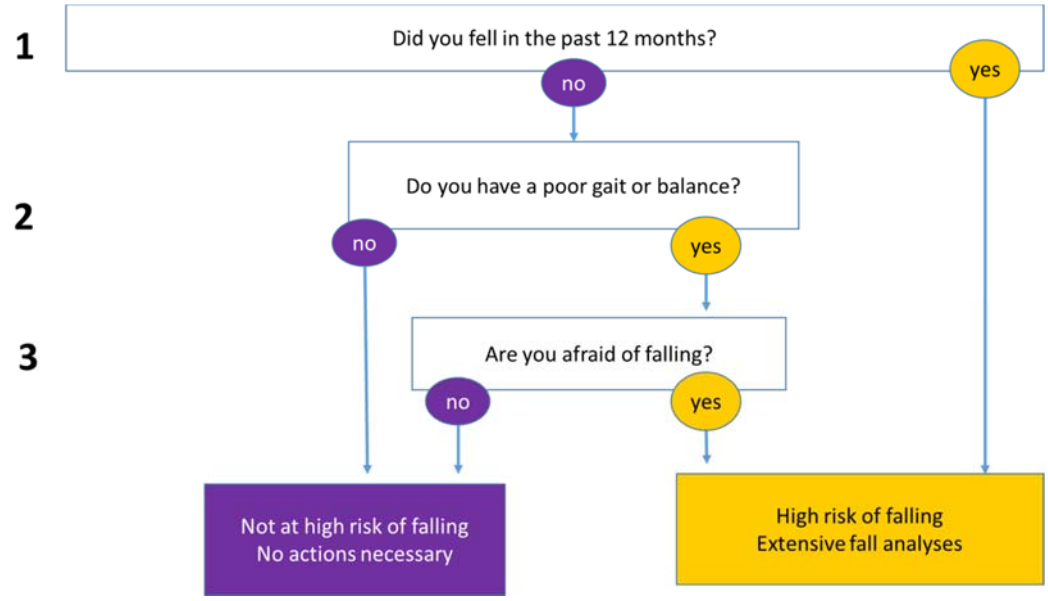
The three elements of the template will be defined below.

4.1. Assessment

A structured assessment takes place in order to assess the situation of the elderly and to identify potential problems. The assessment contains of a frailty index, questions concerning fall risk and medication risk.

The Tilburg Frailty Index will be used to detect frailty [34]. Additionally, three questions will be asked to assess high risk of falling (see figure 3) and two questions for polypharmacy (MRQ-10).

Figure 3 Assessment of fall risk



Based on the assessment, an indication is described for each pathway.

4.2. Shared decision making

The results of the assessment and a care plan will be discussed by the nurse, physician, elderly and family of the elderly. Shared decisions will be made on pathways to follow.

Depending on the results of the assessment, different pathways can be followed simultaneously or one after the other.

4.3. Pathways

Based on evidence, pathways were developed with regard to polypharmacy, fall prevention, loneliness, depression, cognition, and social support (see Annex 3). Each pathways contains:

1. Indication for the pathway
2. Extended analyses (if necessary)
3. Interventions

These pathways were developed from January 2014 till September 2014. In September 2014 a project meeting has taken place in Rijeka, Croatia. The five pathways were discussed during this meeting with all the pilot leaders of the work packages. The overall conclusion was that there were too many different pathways.

Subsequently, in total three pathways needed to be selected. The pathways were chosen, based on the needs and preferences of the elderly, informal and formal caregivers, determined by the focus group interviews.

Based on the results of the focus group interviews, the pathways fall, polypharmacy and loneliness were further developed. Additionally, a general pathway was developed, called medical pathway.

4.3.1. Pathway fall

INDICATION

The indication for the pathway fall is:

- Fall in the past 12 months

  OR

- Difficulty maintaining balance or difficulty in walking AND afraid of

EXTENDED ANALYSES

The extended analyses contains a risk analyses of falling including a home safety analyses.

A quick search has been performed for home safety assessment tools. Falling can be caused by multiple risk factors. Intrinsic risk factors, like previous falls, muscle weakness, gait and balance problems, poor vision, medicines, fear of falling, and feet problems and extrinsic risk factors, like environmental hazards (poor lightning, slippery floors, uneven surfaces, etc.), footwear and clothing, and inappropriate walking aids or assistive devices.

No home safety screening tool has been used or validated Europe-wide to assess risk of falling among older people either in the community or in residential care facilities. The following assessment tools could be used:

- Home Safety Assessment Tool (http://agingresearch.buffalo.edu/hssat/)[35]
- A self-assessment tool was reliable in identifying hazards in the homes of elders [36]
- Home Falls and Accidents Screening Tool (HOME FAST) [37]
- Home-safety checklist [38]

INTERVENTIONS

The intervention within the pathway fall consists of:

Multifactorial intervention programme, including exercise programme, home safety adjustments and aids.

The intervention should have at least the following 3 components:

1) (Advice about) An exercise programme with at least 2 of the following categories of exercise:
    a) Gait or balance
    b) Strength or resistance training
    c) Flexibility
    d) 3D (Tai Chi, dance, etc)
    e) General physical activity
    f) Endurance
2) (Advice about) Home safety adjustments, if risks are present (at least advice about)
3) (Advice about) Aids, if recommended (at least advice about)

4.3.2. Pathway polypharmacy

INDICATION

The indication for the pathway polypharmacy is:

- Currently taking 5 or more different medicines

  AND
- Difficult to take the medicines as prescribed

EXTENDED ANALYSES

The extended analyses contains a compliance analyses.

INTERVENTIONS

The intervention within the pathway polypharmacy consists of:

Self-management programme including devices, like simplified dosing regimens.

The intervention should have the following components:

1) (Advice about) Activities to stimulate compliance, like:
    a) Arranging a person to help with medication (supportive network, that can help motivate and remind you to take your medication as scheduled)

b) Develop a schedule to take the medication
c) Make a medication passport, including non-prescribed medication (what kind of medication and frequency, etc)
d) Give information about medication, like:
    i) What is the drug used for
    ii) How should you take it. For how long.
    iii) When should you take it
    iv) What side effects may occur. How do you recognize these side effects.
    v) What does the drugs interact with
    vi) How long does it take for the drug to work
    vii) What should you do when you miss a dose
    viii) Any precautions to take when you use the drug
    ix) How should you store the drug
e) Visit the copy machine before the pharmacy. This way you can check the information on the pill bottle label to make sure you have received the correct drug and dose.
f) Make sure you always have your medication on hand at all times
g) Reminders, like notes, checklists, diaries and other self reminders

2) (Advice about) Devices, like simplified dosing regimens

4.3.3. Pathway loneliness

INDICATION

The indication for the pathway loneliness is:

- Currently taking 5 or more different medicines

  AND
- Difficult to take the medicines as prescribed

EXTENDED ANALYSES

The extended analyses contains a compliance analyses.

INTERVENTIONS

The intervention within the pathway loneliness consists of:

Social activity within a group

The intervention should have the following components:

1) (Advice about) social activity with the following components:
    a) Group activity
    b) Elderly are active participants
    c) If possible, at least 5 months (more likely to be effective)

Examples of interventions are:

- Picture book reading to children
- Discussion counselling, targeting specific groups, such as women, widowed.
- Playing card games
- Psychosocial group nursing
- Art & inspiring activities
- Therapeutic writing & group therapy
- Group activities with an educational input
- Leisure/cultural group activities
- Activity group including a mutual help network

4.3.4. Pathway medical

INDICATION

The indication for the pathway medical is:

- Score ≥ 5 on the Tilburg frailty index

EXTENDED ANALYSES

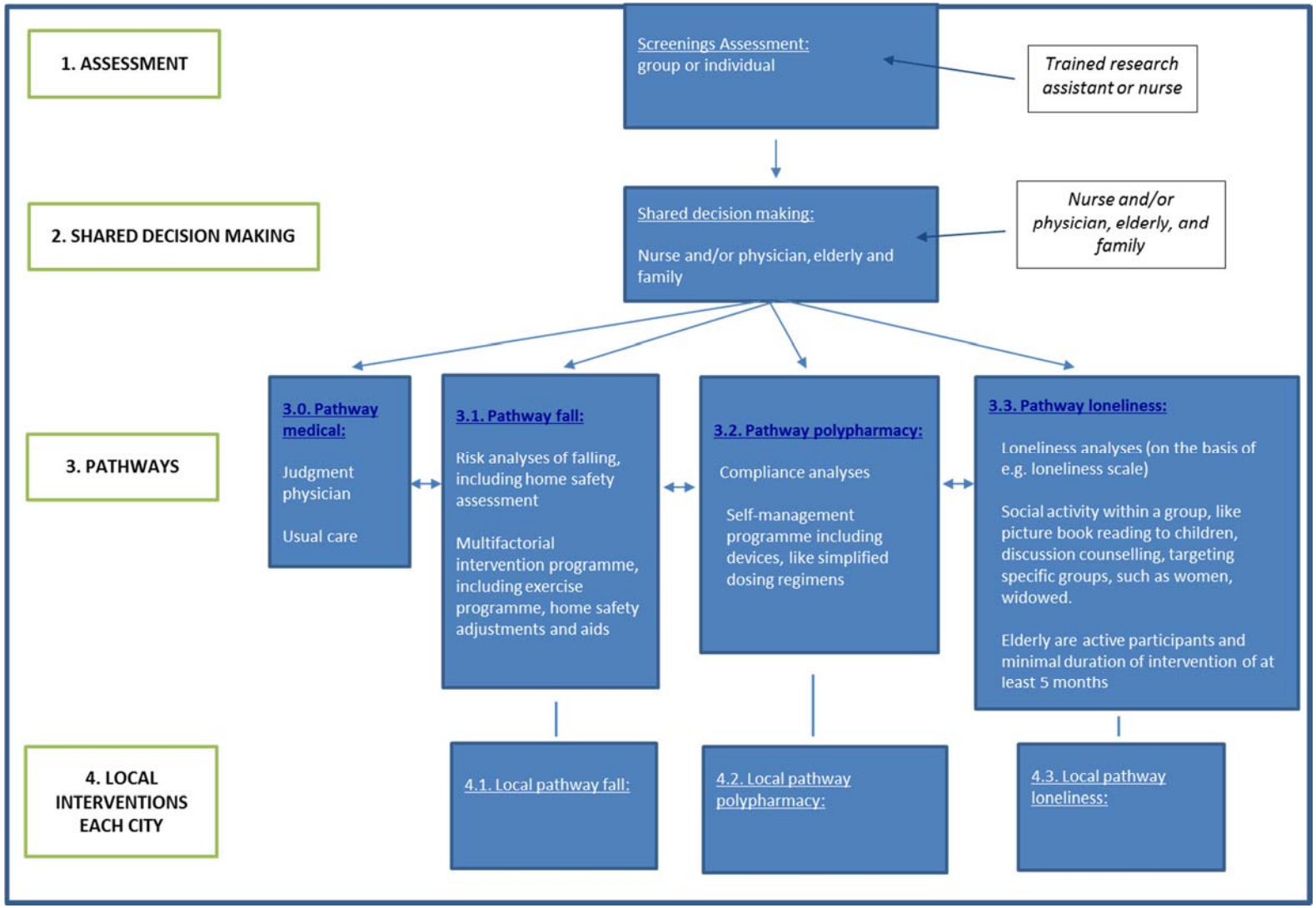
The extended analyses is based on the judgement of the general physician.

INTERVENTIONS

The intervention within the pathway medical consists of usual care.

The interventions within the pathways are generally described. The next step is to identify local interventions within the context of each city. An overview of the generic template is shown in Figure 4.

Figure 4 Generic template



5. The Cookbook

The development of the generic template with the care pathways, the evidence based interventions, and the adaptation of the generic template to the local situation of the five European cities will be of interest to other people, besides the people involved in this project.

At the end of the project an internet toolbox will be produced to disseminate the innovative UHCE. The name of the toolbox will be ***Cookbook*** and it will contain recipes with the important ingredients. Different cakes will be baked, but a muffin in Manchester will differ from a yogurt cake in Greece. The end users of the cookbook will be the elderly, professionals, researchers, and policymakers and managers.

The cookbook will enclose among other things the generic template, (local) instruments, (local) evidence based interventions, and grey literature.

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Overview of annexes

1. Assessment
2. Tables evidence based interventions
3. Five pathways presented in Rijeka September 2014
4. Focus group numbers
5. Labels focus group interviews elderly
6. Labels focus group interviews informal caregivers
7. Labels focus group interviews professionals
8. Labels interviews policymakers

Annex 1: Assessment

The screenings assessment

Tilburg Frailty index

B1 Physical components

1. Do you feel physically healthy? 0 yes 0 no

2. Have you lost a lot of weight recently without wishing to do so? 0 yes 0 no

('a lot' is: 6 kg or more during the last six months, or 3 kg or more during the last month)

Do you experience problems in your daily life due to:

3. .....difficulty in walking? 0 yes 0 no

4. .....difficulty maintaining your balance? 0 yes 0 no

5. .....poor hearing? 0 yes 0 no

6. .....poor vision? 0 yes 0 no

7. .....lack of strength in your hands? 0 yes 0 no

8. .....physical tiredness? 0 yes 0 no

B2 Psychological components

9. Do you have problems with your memory? 0 yes 0 sometimes 0 no

10. Have you felt down during the last month? 0 yes 0 sometimes 0 no

11. Have you felt nervous or anxious during the last month? 0 yes 0 sometimes 0 no

12. Are you able to cope with problems well? 0 yes 0 no

B3 Social components

13. Do you live alone? 0 yes 0 no

14. Do you sometimes miss having people around you? 0 yes 0 sometimes 0 no

15. Do you receive enough support from other people? 0 yes 0 no

Risk of falling

Are you afraid of falling? 0 yes 0 no

Did you fall in the past 12 months? 0 yes 0 no

Medication (MRQ-10)

Do you currently take 5 or more different medicines? 0 yes 0 no

Is it difficult for you to take your medicines as prescribed? 0 yes 0 no

Annex 2: Tables evidence based interventions

Fall prevention

Author	Design	Conclusions
Gillepsie (2012)	Cochrane review	Group and home-based exercise programmes, and home safety interventions reduce rate of falls and risk of falling. Multifactorial assessment and intervention programmes reduce rate of falls but not risk of falling; Tai Chi reduces risk of falling. Overall, vitamin D supplementation does not appear to reduce falls but may be effective in people who have lower vitamin D levels before treatment.
Howe (2011)	Cochrane review	There is weak evidence that some types of exercise (gait, balance, co-ordination and functional tasks; strengthening exercise; 3Dexercise and multiple exercise types) are moderately effective, immediately post intervention, in improving clinical balance outcomes in older people. Such interventions are probably safe. There is either no or insufficient evidence to draw any conclusions for general physical activity (walking or cycling) and exercise involving computerised balance programmes or vibration plates. Further high methodological quality research using core outcome measures and adequate surveillance is required.
Turner (2011)	Cochrane review	There is insufficient evidence to determine whether interventions focused on modifying environmental home hazards reduce injuries. Further interventions to reduce hazards in the home should be evaluated by adequately designed randomised controlled trialsmeasuring injury outcomes. Recruitment of large study samples to measure effect must be a major consideration for future trials. Researchers should also consider using factorial designs to allow the evaluation of individual components of multifactorial interventions.
Santesso (2014)	Cochrane review	Hip protectors probably reduce the risk of hip fractures if made available to older people in nursing care or residential care settings, without increasing the frequency of falls.However, hip protectorsmay slightly increase the small risk of pelvic fractures. Poor acceptance and adherence by older people offered hip protectors is a barrier to their use. Better understanding is needed of the personal and design factors that may influence acceptance and adherence.

Polypharmacy

Author	Design	Conclusions	Quality
Patterson (2012)	Cochrane review	It is unclear if interventions to improve appropriate polypharmacy, such as pharmaceutical care, resulted in a clinically significant improvement; however, they	

		appear beneficial in terms of reducing inappropriate prescribing and medication-related problems. 10 studies, 1 computerised decision support and 9 complex, multifaceted pharmaceutical care. The interventions included in this review demonstrated a reduction in inappropriate medication use. A mean difference of -6.78 (95% CI -12.34 to -1.22) in the change in MAI score in favour of the intervention group (four studies). Postintervention pooled data (five studies) showed a mean reduction of -3.88 (95% CI -5.40 to -2.35) in the summated MAI score and a mean reduction of -0.06 (95% CI -0.16 to 0.04) in the number of Beers drugs per patient (three studies). Evidence of the effect of the interventions on hospital admissions (four studies) was conflicting. Medication-related problems, reported as the number of adverse drug events (three studies), reduced significantly (35%) postintervention.	
Ryan (2014)	Cochrane review	75 systematic reviews of varied methodological quality. Looking across reviews, for most outcomes, medicines self-monitoring and self-management programmes appear generally effective to improve medicines use, adherence, adverse events and clinical outcomes; and to reduce mortality in people self-managing antithrombotic therapy. However, some participants were unable to complete these interventions, suggesting they may not be suitable for everyone. Other promising interventions to improve adherence and other key medicines-use outcomes, which require further investigation to be more certain of their effects, include: simplified dosing regimens: with positive effects on adherence; interventions involving pharmacists in medicines management, such as medicines reviews (with positive effects on adherence and use, medicines problems and clinical outcomes) and pharmaceutical care services (consultation between pharmacist and patient to resolve medicines problems, develop a care plan and provide follow-up; with positive effects on adherence and knowledge).	Included reviews often had methodological limitations - at study level, review level, or both - meaning results should be interpreted with caution.
Topinkova (2012)	review	Among the current information technologies, there is sufficient evidence that computerized decision-making support systems are modestly but significantly effective in reducing inappropriate prescribing and adverse drug events across healthcare settings. The more promising strategies involved pharmacists or multidisciplinary teams including geriatric medicine services. However, methodological weaknesses including population and intervention heterogeneity do not allow for comprehensive meta-analyses to determine the clinical value of individual approaches. For patients with multiple conditions and polypharmacy, successful	

	interventions included structured medication review, medication regimen simplification, administration aids and medication reminders, but no firm conclusion in favour of any particular intervention could be made.

Loneliness

Author	Design	Conclusions
Dickens (2011)	systematic review	More, well-conducted studies of the effectiveness of social interventions for alleviating social isolation are needed to improve the evidence base. However, it appeared that common characteristics of effective interventions were those developed within the context of a theoretical basis, and those offering social activity and/or support within a group format. Interventions in which older people are active participants also appeared more likely to be effective. Future interventions incorporating all of these characteristics may therefore be more successful in targeting social isolation in older people. 32 studies (16 RCT and 16 quasi-exp), 7 studies evaluated activity interventions, 15 evaluated support interventions, 5 evaluated home visiting, 4 evaluated internet training, 1 evaluated a service provision intervention (Moderate and high risk of bias).
Hagan (2014)	systematic search and narrative review	17 studies There was limited evidence of the effectiveness of one-to-one interventions on the basis of the three studies examined. One structured group work intervention was found to be effective. The highlight of this review, however, was that three of the four interventions demonstrating measurable effect on reducing loneliness amongst older people involved introducing new technologies. Whilst these studies reported relatively small numbers and may not be generalizable to a larger population, these investigations do highlight the need for further research to be conducted in this particular area.
Cattan (2005)	Systematic review	Nine of the 10 effective interventions were group activities with an educational or support input. Six of the eight ineffective interventions provided one-to-one social support, advice and information, or health-needs assessment. The review suggests that educational and social activity group interventions that target specific groups can alleviate social isolation and loneliness among older people. The effectiveness of home visiting and befriending schemes remains unclear.
Findlay (2003)	review	survey of 17 interventions found a single one-to-one intervention, involving informal referrals to other services, significantly effective but hypothesised that group interventions were more likely to be effective if they were at least 5 months in duration.
Morris (2014)	Systematic review	Smart technologies, such as tailored internet programs, may help older people better manage and understand various health

		conditions, resulting in subsequent improvements in aspects of social connectedness. Further research is required regarding how technological innovations could be promoted, marketed and implemented to benefit older people. 18 studies
Masi (2011)	Meta-analyses	Moderator analysis demonstrated that, among the randomized studies, interventions that addressed maladaptive social cognition had a larger mean effect size compared to interventions that addressed social support, social skills, and opportunities for social intervention. 50 studies

Cognition

Author	Design	Conclusions
Angevaren (2008)	Cochrane review	11 RCT's of aerobic physical activity programmes for healthy people over the age of 55 years have been included in this review. Eight of these 11 studies reported that aerobic exercise interventions resulted in increased fitness of the trained group and an improvement in at least one aspect of cognitive function. The largest effects were on cognitive speed, auditory and visual attention. However, the cognitive functions which improved were not the same in each study and the majority of comparisons yielded no significant results. The data are insufficient to show that the improvements in cognitive function which can be attributed to physical exercise are due to improvements in cardiovascular fitness.
Martin (2011)	Cochrane review	The results suggest that cognitive interventions do lead to performance improvements and that the size of the effects differs for different kinds of memory skills in healthy older adults and people with mild cognitive impairment. In particular, immediate and delayed verbal recall improved significantly through training compared to a no-treatment control condition but the improvements observed did not exceed the improvement in the active control conditions. 36 RCT's
Carvalho (2014)	Systematic review	The preponderance of evidence suggests that physical activity is beneficial for cognitive function in the elderly. 26 of 27 studies showed a significant association between physical activity and cognitive decline, whereby an increased level of physical activity resulted in attenuation of cognitive decline and cognitive disease. However, the majority of the evidence is of medium quality with a moderate risk of bias. Larger randomized controlled trials are needed to clarify the association between exercise and cognitive function and to determine which types of exercise have the greatest benefit on specific cognitive domains. Despite these caveats, the current evidence suggests that physical activity may help to improve cognitive function and, consequently, delay the progression of cognitive impairment in

		the elderly. 27 studies (15 prospective cohorts, 10 RCTs, 1 case-control study, and 1 observational study)
Law (2014)	Systematic review	In conclusion, combined cognitive and exercise training can be effective for improving the cognitive functions and functional status of older adults with and without cognitive impairment. How-ever, limited evidence can be found in populations with cognitive impairment when the evaluation includes an active control group comparison. More well-designed studies are required before one can draw any firm conclusion on the efficacy of the combined cognitive and exercise intervention in older adults.

Depression

Author	Design	Conclusions
Wilson (2001)	Cochrane review	TCAs (Tricyclic antidepressants), SSRIs (selective serotonin reuptake inhibitors) and MAOIs (Monoamine oxidase inhibitors and related antidepressants) are effective in the treatment of depression in older community patients. At least six weeks of antidepressant treatment is recommended to achieve optimal therapeutic effect. 17 trials, 245 patients treated with Tricyclic antidepressants (223 with placebo), 365 patients treated with SSRIs (372 with placebo) and 58 patients treated with MAOIs (63 with placebo).
Wilson (2008)	Cochrane review	Only a small number of studies and patients were included in the meta-analysis. If taken on their own merit, the findings do not provide strong support for psychotherapeutic treatments in the management of depression in older people. However, the findings do reflect those of a larger meta-analysis that included patients with broader age ranges, suggesting that CBT may be of potential benefit 9 trials of cognitive behavioural and psychodynamic therapy approaches. 5 trials (153 participants), cognitive behavioural therapy was more effective than waiting list controls (WMD -9.85, 95% CI -11.97 to -7.73). 3 trials with usable data, CBT was superior to active control interventions when using the Hamilton Depression Rating Scale (WMD -5.69, 95% CI -11.04 to -0.35), but equivalent when using the Geriatric Depression Scale (WMD -2.00, 95% CI -5.31 to 1.32).
Cuijpers (2009)	Systematic review (meta-analyses)	Coping with depression is effective in the prevention of new cases of major depressive disorders, in those who did not meet criteria for such a disorder at baseline. Those who participated in a preventive version of the CWD had 38% less chance of developing a major depressive disorder than those who did not participate ($p<0.05$) . The efficacy of the CWD has been examined in 25 randomized

		controlled trials. We conducted a meta-analysis of these studies. 6 studies aimed at the prevention of new cases of major Depression, 18 studies examining the CWD as a treatment of depression
Cuijpers (2014)	Systematic review (updated meta-analyses)	We conclude that it is safe to assume that psychological therapies in general are effective in late-life depression, and this is especially well-established for cognitive behavior therapy and problem-solving therapy. 44 studies comparing psychotherapies to control groups, other therapies or pharmacotherapy. overall effect size indicating the difference between psychotherapy and control groups was g = 0.64 (95% CI: 0.47–0.80), which corresponds with a NNT of 3. These effects were maintained at 6months or longer post randomization (g = 0.27; 95%CI: 0.16–0.37). Specific types of psychotherapies that were found to be effective included cognitive behavior therapy (g = 0.45; 95% CI: 0.29–0.60), life review therapy (g = 0.59; 95% CI: 0.36–0.82) and problem-solving therapy (g = 0.46; 95% CI: 0.18–0.74). Studies with lower quality resulted in higher effect sizes thanhigh-quality studies ($p < 0.05$).
Mottram (2006)	Cochrane review	32 trials Our findings suggest that SSRIs and TCAs are of the same efficacy. However, we have found some evidence suggesting that TCA related antidepressants and classical TCAs have different side effect profiles and are associated with differing withdrawal rates when compared with SSRIs. The review suggests that classical TCAs are associated with a higher withdrawal rate due to side effect experience, although these results must be interpreted with caution due to the heterogeneity of the drugs and patient populations.
Van der Wurff (2003)	Cochrane review	4 trials None of the objectives of this review could be adequately tested because of the lack of firm, randomised evidence. Given the specific problems in the treatment of depressed elderly, a well designed randomised controlled trial should be conducted in which the efficacy of ECT is compared to one or more antidepressants.
Wilkinson (2012)	Cochrane review	7 trails The long-term benefits of continuing antidepressant medication in the prevention of recurrence of depression in older people are not clear and no firm treatment recommendations can be made on the basis of this review. Continuing antidepressant medication for 12 months appears to be helpful but this is based on only three small studies with relatively few participants using differing classes of antidepressants in clinically heterogeneous populations. Comparisons at other time points did not reach statistical significance. Data on psychological therapies and combined

		treatments are too limited to draw any conclusions.
Francis (2013)	review	17 trials Results indicate that all psychological interventions reviewed were effective in reducing depressive symptoms in older adults. Future research should include larger sample sizes and focus on moderators of treatment such as age, depression severity, medical illness, and cognitive impairment.
Renner (2014)	Review (meta-analyses)	Psychotherapy for depression results in small to moderate improvements in social functioning, before [Hedges' g=0.46, 95% confidence interval (CI) 0.32–0.60] and after adjusting for publication bias (g=0.40, 95% CI 0.25–0.55). These improvements are strongly associated with, but not fully explained by, improvements in depressive symptoms. Only studies that compared psychotherapy to a control condition were included (31 studies with 2956 patients).
Cooney (2013)	Cochrane review	Exercise is moderately more effective than a control intervention for reducing symptoms of depression, but analysis of methodologically robust trials only shows a smaller effect in favour of exercise. When compared to psychological or pharmacological therapies, exercise appears to be no more effective, though this conclusion is based on a few small trials. For the 35 trials (1356 participants) comparing exercise with no treatment or a control intervention, the pooled SMD for the primary outcome of depression at the end of treatment was -0.62 (95% confidence interval (CI) -0.81 to -0.42), indicating a moderate clinical effect. There was moderate heterogeneity (I^2 = 63%). When we included only the six trials (464 participants) with adequate allocation concealment, intention-to-treat analysis and blinded outcome assessment, the pooled SMD for this outcome was not statistically significant (-0.18, 95% CI -0.47 to 0.11). Pooled data from the eight trials (377 participants) providing long-term follow-up data on mood found a small effect in favour of exercise (SMD - 0.33, 95% CI -0.63 to -0.03). Seven trials compared exercise with psychological therapy (189 participants), and found no significant difference (SMD -0.03, 95% CI -0.32 to 0.26). Four trials (n = 300) compared exercise with pharmacological treatment and found no significant difference (SMD -0.11, -0.34, 0.12). One trial (n = 18) reported that exercise was more effective than bright light therapy (MD -6.40, 95% CI -10.20 to -2.60).
Neyer (2013)	review	Physical exercise may be effective in relieving symptoms of mild to moderate depression in older adults. Despite the promising results of previous studies, methodological problems, such as small sample size, varying definitions of depression, and insufficient follow-up data, limit existing findings. Further well-controlled

		studies are required comparing the effects of different forms of exercise on late-life depression.
Mura (2013)	Review	In the last 20 years, few progresses were done in showing the efficacy of exercise on depression, due in part to the persistent lack of high quality research, in part to clinical issues of management of depression in late life, in part to the difficult to establish the real effectiveness of exercise on depressive symptoms in elderlies. However, there are some promising findings on physical activity combined with antidepressants in treatment resistant late life depression. 44 papers were retrieved by the search. Among the 10 included randomized controlled trials, treatment allocation was adequately conceived in 4 studies, intention-to-treat analysis was performed in 6 studies, but no study had a double-blinded assessment.
Bridle (2012)	Systematic review and meta-analyses	Our findings suggest that, for older people who present with clinically meaningful symptoms of depression, prescribing structured exercise tailored to individual ability will reduce depression severity. 9 trials met inclusion criteria and 7 were meta-analysed. Exercise was associated with significantly lower depression severity (standardised mean difference (SMD) =70.34, 95% CI 70.52 to 70.17), irrespective of whether participant eligibility was determined by clinical diagnosis (SMD =70.38, 95% CI 70.67 to 70.10) or symptom checklist (SMD =70.34, 95% CI 70.62 to 70.06). Results remained significant in sensitivity analyses.

Annex 3: Five pathways presented in Rijeka September 2014

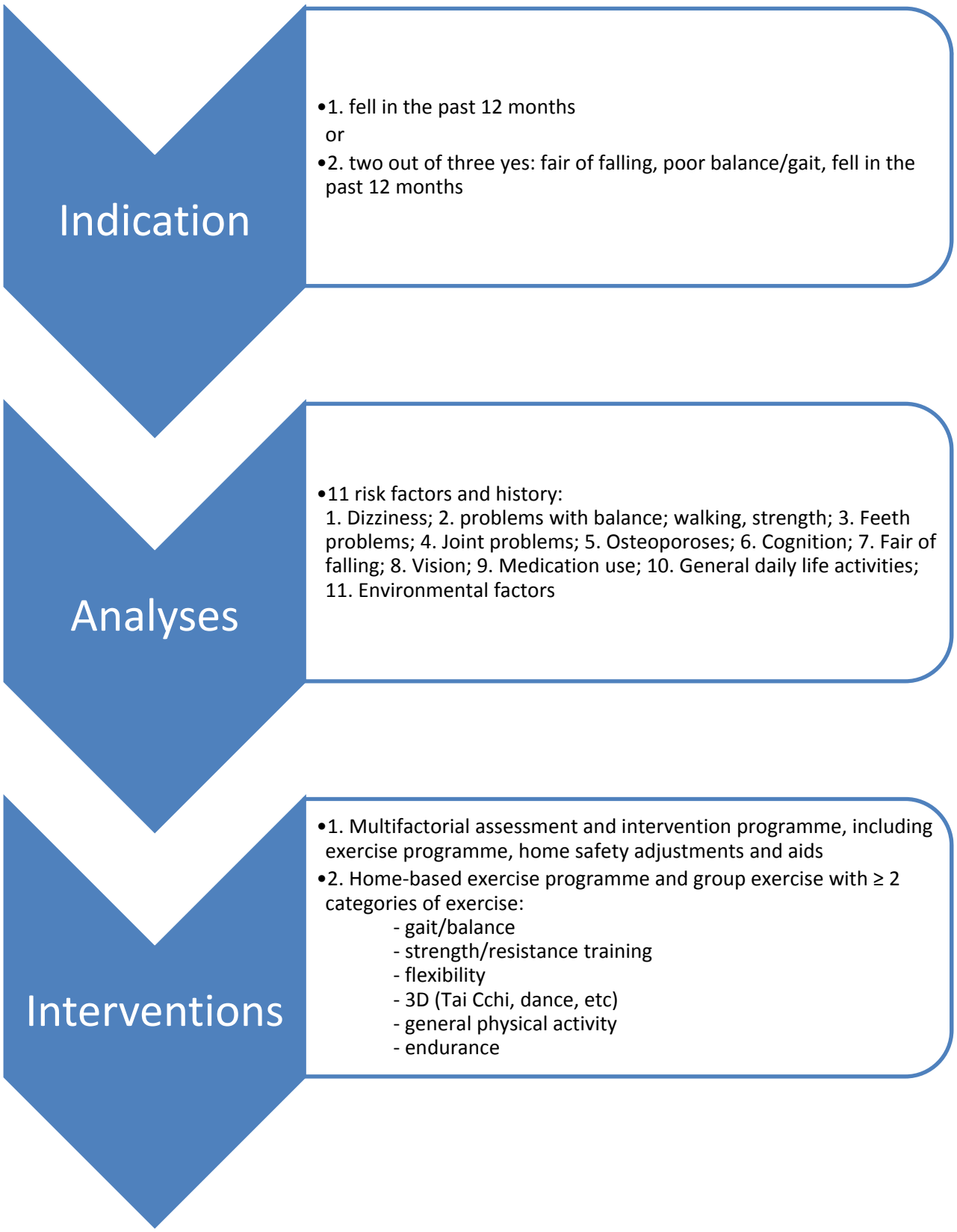
Based on evidence and results of the focus group interviews, pathways were developed on the subjects polypharmacy, fall prevention, and loneliness, depression, cognition, and social support. Each pathway contains:

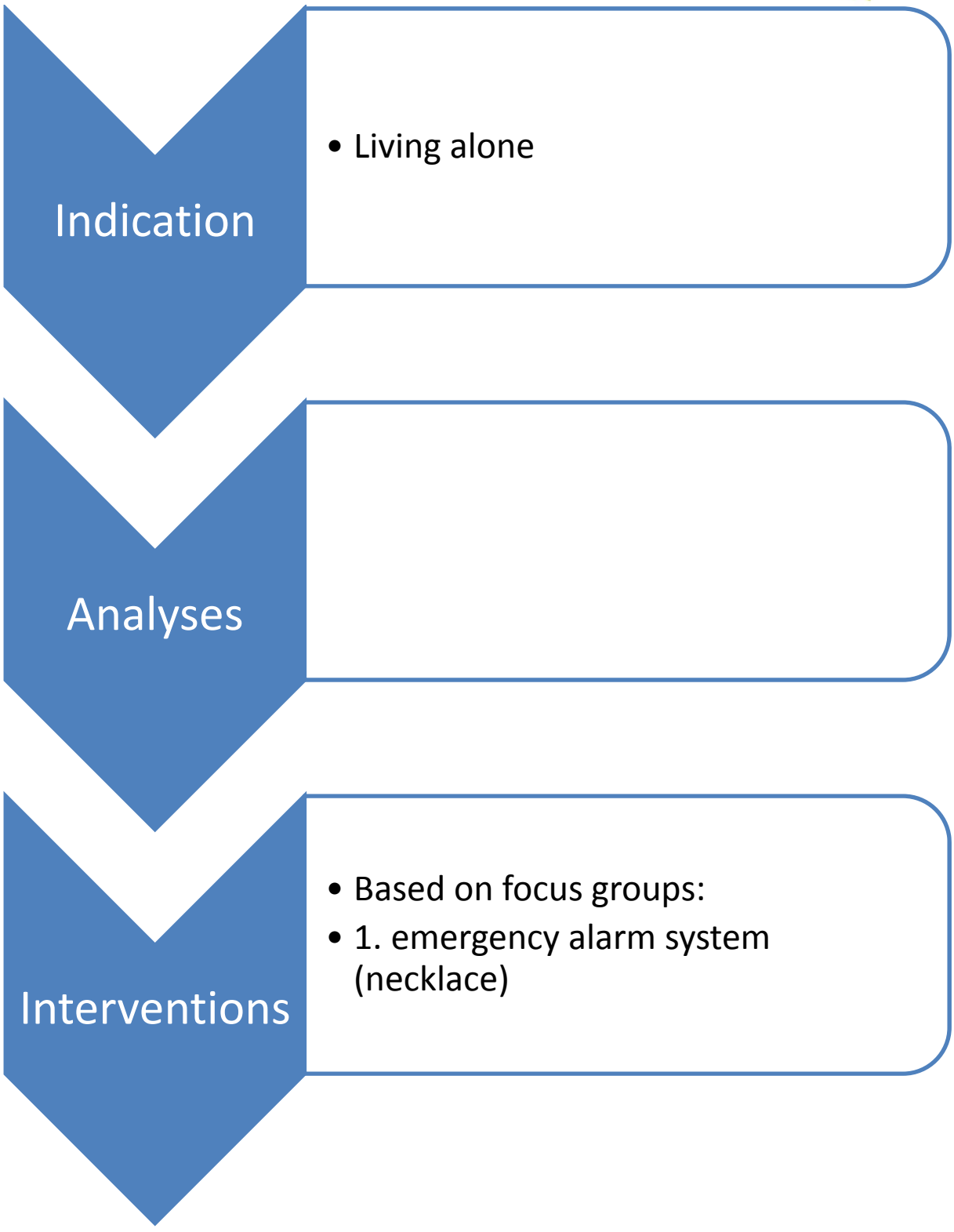
- Indication
- Further analyses
- Interventions

Based on the assessment, an indication is described for each pathway. A pathway should be followed if the patient meets the criteria of the indication of the pathway. Depending on the results of the assessment, different pathways can be followed simultaneously.
The interventions within the pathways are generally described. The next step is to identify local interventions within the context of each city.

Below the different pathways are described. The literature search of each pathway can be found in the annexes (annex 2-6).

FALL PREVENTION



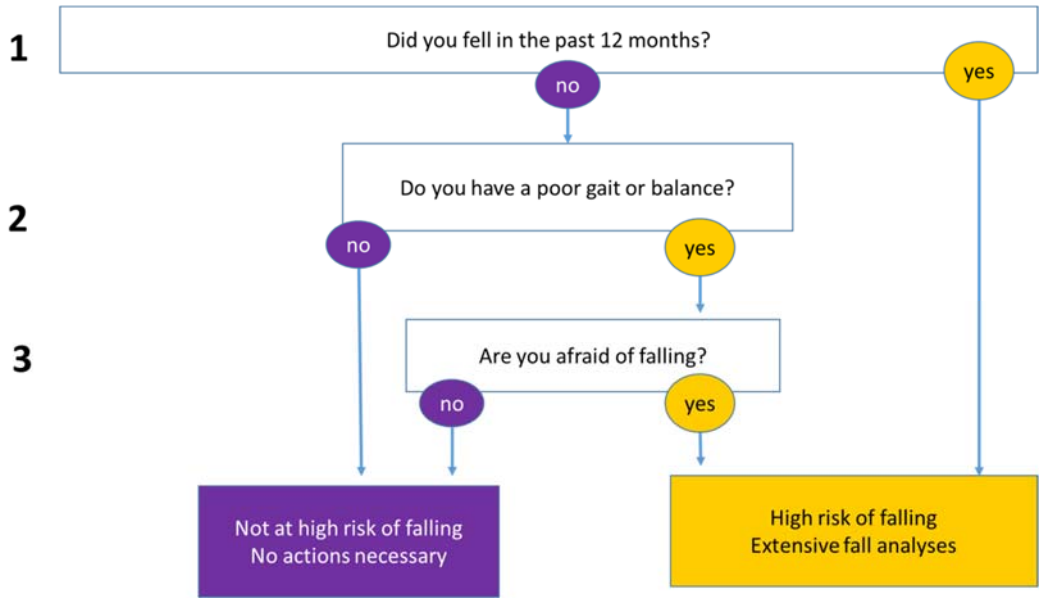

Indication
• Living alone
Analyses
Interventions
• Based on focus groups:
• 1. emergency alarm system (necklace)

Objective

- To prevent future falling
- To decrease rate of falls

Screening

1. Identify elderly at high risk of falling by asking the following 3 questions concerning history of falling, gait or balance and fair of falling {Peeters, 2011 #2}:
    1. Did you fell in the past 12 months?
    2. Do you have a poor gait or balance
    3. Are you afraid of falling?



Based on Veiligheid.nl

2. Home safety assessment at home by nurse/trained research assistant

Diagnostic

If there is a high risk of falling, an extensive analyses will be performed that could explain the high risk of falling. Veiligheid.nl advises to assess 12 risk factors, namely the fall, dissiness, mobility (foot problems and joint problems), osteoporosis, cognition, fair of falling, vision, use of medication, daily activities and, environmental factors.

Interventions

Determine relevant combinations of interventions for elderly individually.

Evidence based interventions

- home-based exercise programmes (rate of falls and risk of falling) and group exercise programmes (rate of falls and risk of falling) {Gillespie, 2012 #3}
    - yes:
        - group exercise and homes based exercise, multiple components; 2 or more categories of exercise;
            - gait/balance/functional training
            - strength/resistance training
            - flexibility
            - 3D (Tai Chi, dance etc)
            - General physical activity
            - endurance
        - Tai Chi
    - no:
        - (home-based) strength/resistance training no evidence or adverse events
        - Walking groups no effect (n=2)
        - Gait or balance or co-ordination and functional tasks or strengthening exercise or 3Dexercise or multiple exercise types to improve clinical balance outcomes, only weak evidence moderately effective {Howe, 2011 #4}

- home safety programmes (rate of falls and risk of falling) {Gillespie, 2012 #3}
    - some evidence that occupational therapist (OT) led interventions more effective than non-OT led interventions (rate of falls and risk of falling) (n=8)
    - However, none of the studies focusing on older people demonstrated a reduction in injuries (or falls) that were a direct result of environmental modification in the home. Only 2 of 28 studies allowed pooling of data for statistical analyses {Turner, 2011 #5}

- multifactorial assessment and intervention programmes (=more than one main category of intervention, but participants receive different combinations of interventions based on an individual assessment to identify potential risk factors for falling) (rate of falls) {Gillespie, 2012 #3}

- Volgens veiligheid.nl: Een multifactoriële interventie is het meest effectief. Een valpreventieprogramma bestaat daarom ten minste uit een beweegprogramma in combinatie met medicatiebewaking en/of vitamine D suppletie en/of visus verbetering en/of aanpassing in woning en woonomgeving.

Interventions not effective

- Vision improvement (n=3), no sign reduction in rate of falls or risk of falling {Gillespie, 2012 #3}
- Psychological interventions (cognitive behavioural) {Gillespie, 2012 #3}
- Fluid or nutrition therapy {Gillespie, 2012 #3}
- Knowledge/education interventions are inconclusive {Gillespie, 2012 #3}

- Vitamin D supplementation {Gillespie, 2012 #3}
- moderate quality evidence when pooling data from five trials in the community (5614 participants) that shows little or no effect in hip fracture risk (RR 1.15, 95% CI 0.84 to 1.58) (nursing or residential care settings: moderate quality evidence for small reduction in hip fracture risk (risk ratio (RR) 0.82, 95% confidence interval (CI) 0.67 to 1.00)) {Santesso, 2014 #6}

Author	Design	Conclusions
Gillepsie (2012)	Cochrane review	Group and home-based exercise programmes, and home safety interventions reduce rate of falls and risk of falling. Multifactorial assessment and intervention programmes reduce rate of falls but not risk of falling; Tai Chi reduces risk of falling. Overall, vitamin D supplementation does not appear to reduce falls but may be effective in people who have lower vitamin D levels before treatment.
Howe (2011)	Cochrane review	There is weak evidence that some types of exercise (gait, balance, co-ordination and functional tasks; strengthening exercise; 3Dexercise and multiple exercise types) are moderately effective, immediately post intervention, in improving clinical balance outcomes in older people. Such interventions are probably safe. There is either no or insufficient evidence to draw any conclusions for general physical activity (walking or cycling) and exercise involving computerised balance programmes or vibration plates. Further high methodological quality research using core outcome measures and adequate surveillance is required.
Turner (2011)	Cochrane review	There is insufficient evidence to determine whether interventions focused on modifying environmental home hazards reduce injuries. Further interventions to reduce hazards in the home should be evaluated by adequately designed randomised controlled trialsmeasuring injury outcomes. Recruitment of large study samples to measure effect must be a major consideration for future trials. Researchers should also consider using factorial designs to allow the evaluation of individual components of multifactorial interventions.
Santesso (2014)	Cochrane review	Hip protectors probably reduce the risk of hip fractures if made available to older people in nursing care or residential care settings, without increasing the frequency of falls.However, hip protectorsmay slightly increase the small risk of pelvic fractures. Poor acceptance and adherence by older people offered hip protectors is a barrier to their use. Better understanding is needed of the personal and design factors that may influence acceptance and adherence.

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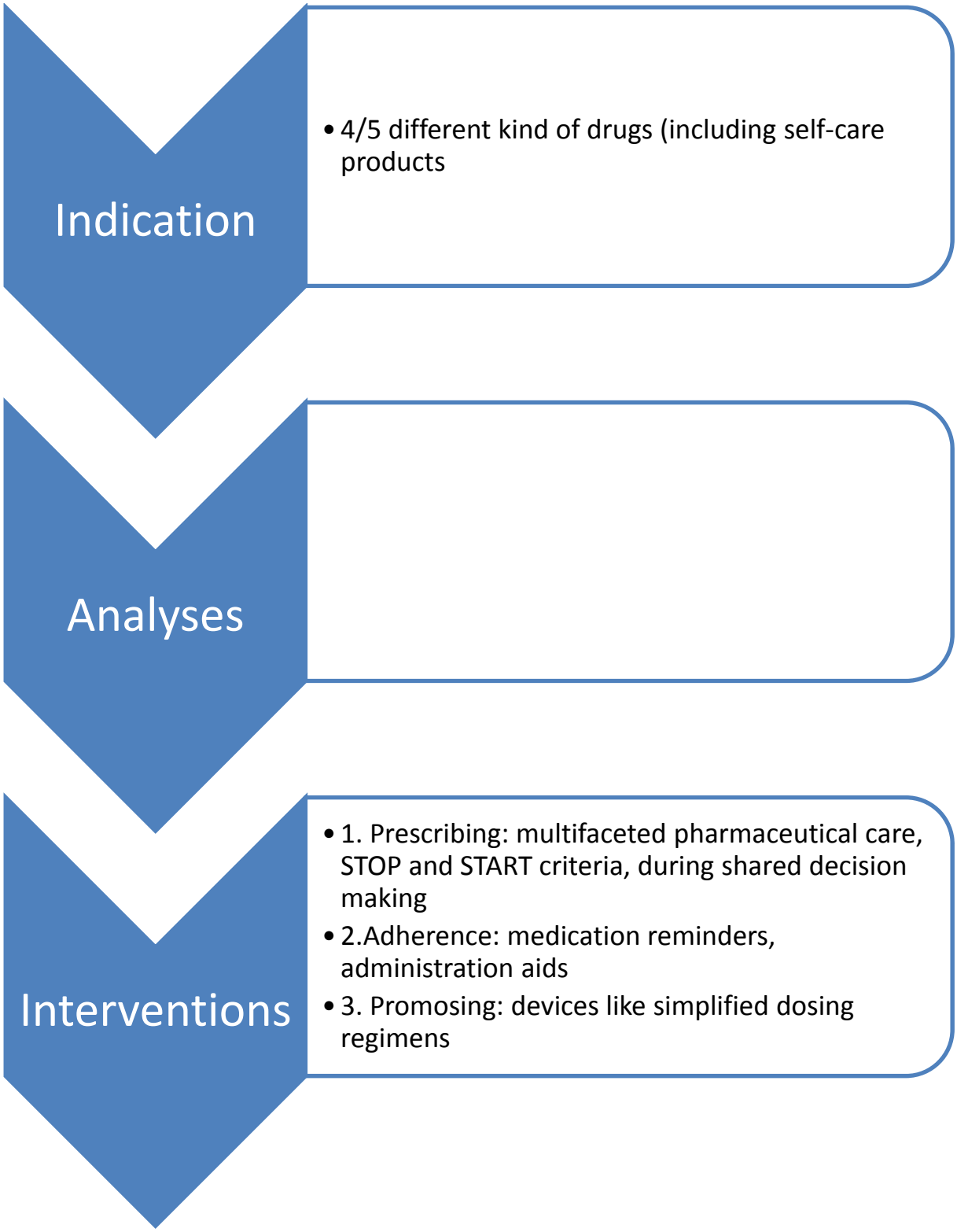
POLYPHARMACY



Objective

- to decrease inappropriate prescribing
- to avoid (as much as possible) avoidable) adverse effects of drugs
- to improve adherence of medication by elderly
- to optimize medication treatment of elderly
- to improve independence with regard to taking in medication

Screening

1. Do you have 4/5 or more different kind of drugs (including self-care products)?
2. Do you experience problems and/or adverse effects with one or more drugs?
3. How do you organize your intake of medication?

Diagnostic

Interventions

Evidence based interventions appropriate prescribing

- multifaceted pharmaceutical care {Patterson Susan, 2012 #3;Topinkova, 2012 #2}

- STRIP (Systematic Tool to Reduce Inappropriate Prescribing) {(NHG), 2012 #5}
  - Step 1: Pharmacy therapeutic history (conversation with elderly)
  - Step 2: Pharmacy therapeutic analyses
  - Step 3: consultation pharmacist and physician
  - Step 4: consultation patient/elderly: determine pharmaceutical treatment plan
  - Step 5: follow- up and monitoring

- STOP (Screening Tool of Older Person's Prescriptions) and START (Screening Tool to Alert doctors to Right Treatment) criteria {Gallagher, 2008 #1;(NHG), 2012 #5}

- computerized decision-making support systems {Topinkova, 2012 #2}

Evidence based interventions adherence

- medicines self-monitoring {Ryan, 2014 #4}

- self-management programmes {Ryan, 2014 #4}

- administration aids {Topinkova, 2012 #2}

- medication reminders{Topinkova, 2012 #2}

Promising:

- simplified dosing regimens {Ryan, 2014 #4;Topinkova, 2012 #2}

- interventions involving pharmacists in medicines management, such as medicines reviews (with positive effects on adherence and use, medicines problems and clinical outcomes){Ryan, 2014 #4;Topinkova, 2012 #2}

- pharmaceutical care services (consultation between pharmacist and patient to resolve medicines problems, develop a care plan and provide follow-up; with positive effects on adherence and knowledge) {Ryan, 2014 #4}

Author	Design	Conclusions	Quality
Patterson (2012)	Cochrane review	It is unclear if interventions to improve appropriate polypharmacy, such as pharmaceutical care, resulted in a clinically significant improvement; however, they appear beneficial in terms of reducing inappropriate prescribing and medication-related problems. 10 studies, 1 computerised decision support and 9 complex, multifaceted pharmaceutical care. The interventions included in this review demonstrated a reduction in inappropriate medication use. A mean difference of -6.78 (95% CI -12.34 to -1.22) in the change in MAI score in favour of the intervention group (four studies). Postintervention pooled data (five studies) showed a mean reduction of -3.88 (95% CI -5.40 to -2.35) in the summated MAI score and a mean reduction of -0.06 (95% CI -0.16 to 0.04) in the number of Beers drugs per patient (three studies). Evidence of the effect of the interventions on hospital admissions (four studies) was conflicting. Medication-related problems, reported as the number of adverse drug events (three studies), reduced significantly (35%) postintervention.	
Ryan (2014)	Cochrane review	75 systematic reviews of varied methodological quality. Looking across reviews, for most outcomes, medicines self-monitoring and self-management programmes appear generally effective to improve medicines use, adherence, adverse events and clinical outcomes; and to reduce mortality in people self-managing antithrombotic therapy. However, some participants were unable to complete these interventions, suggesting they may not be suitable for everyone. Other promising interventions to improve adherence and other key medicines-use outcomes, which require further investigation to be more certain of their effects, include: simplified dosing regimens: with positive effects on adherence; interventions involving pharmacists in medicines management, such as medicines reviews (with positive effects on adherence and use, medicines problems and clinical outcomes) and pharmaceutical care services (consultation between pharmacist and patient to resolve medicines problems, develop a care plan and provide follow-up; with positive effects on adherence and knowledge).	Included reviews often had methodological limitations - at study level, review level, or both - meaning results should be interpreted with caution.
Topinkova (2012)	review	Among the current information technologies, there is sufficient evidence that computerized decision-making support systems are modestly but significantly effective in reducing inappropriate prescribing and adverse drug events across healthcare settings. The more promising strategies involved pharmacists or multidisciplinary teams including geriatric medicine services. However, methodological	

	weaknesses including population and intervention heterogeneity do not allow for comprehensive meta-analyses to determine the clinical value of individual approaches. For patients with multiple conditions and polypharmacy, successful interventions included structured medication review, medication regimen simplification, administration aids and medication reminders, but no firm conclusion in favour of any particular intervention could be made.	

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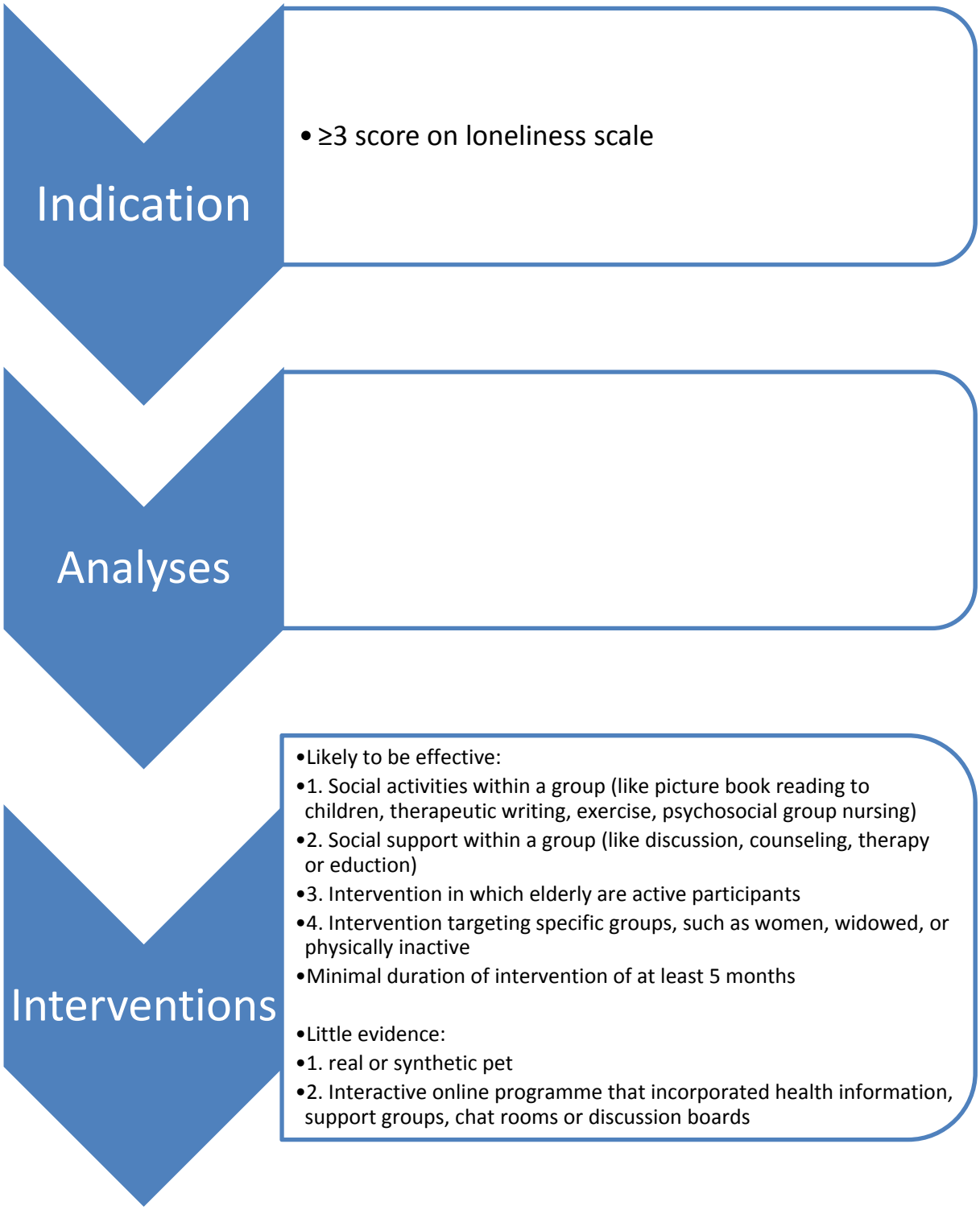
LONELINESS


Indication
• ≥3 score on loneliness scale
Analyses
Interventions
•Likely to be effective:
•1. Social activities within a group (like picture book reading to children, therapeutic writing, exercise, psychosocial group nursing)
•2. Social support within a group (like discussion, counseling, therapy or eduction)
•3. Intervention in which elderly are active participants
•4. Intervention targeting specific groups, such as women, widowed, or physically inactive
•Minimal duration of intervention of at least 5 months
•Little evidence:
•1. real or synthetic pet
•2. Interactive online programme that incorporated health information, support groups, chat rooms or discussion boards

Objective

- To enhance social support
- To tackle loneliness
- To enhance (quality of) social interactions

Screening

Loneliness scale {de Jong Gierveld , 2011 #3}

Diagnostic

Interventions

Qualitative reviews have identified four primary intervention strategies: 1) improving social skills, 2) enhancing social support, 3) increasing opportunities for social contact, and 4) addressing maladaptive social cognition {Masi, 2011 #5}

Evidence based interventions

Likely to be effective:

General characteristics:

- Group activities {Cattan, 2005 #6;Dickens, 2011 #1}
- Interventions in which elderly are active participants, entailed active input from participants involving social contact (not necessarily face to face) rather than them simply being recipients of a service or education/training (it appears that programmes that enable older people to be involved in planning, developing and delivering activities are most likely to be effective) {Dickens, 2011 #1}.
- interventions having a theoretical basis; cited a specific theory underlying their intervention design, or reported that the intervention was based on a broad theoretical approach.{Dickens, 2011 #1}
- interventions targeting specific groups, such as women, care-givers, the widowed or the physically inactive {Cattan, 2005 #6}
- minimal duration of intervention (implementation period of at least 5 months more likely to be effective {Findlay, 2003 #7})

Type of interventions

- Social activities within a group (like psychosocial group nursing, inc art & inspiring activities, exercise & discussions, therapeutic writing & group therapy; Activity group including a mutual help network and leisure/cultural group activities; Picture book reading to children) > more new friendships {Dickens, 2011 #1;Cattan, 2005 #6}
- Social support within an group benefits (discussion, counselling, therapy or education)> reduced loneliness and depression and enhanced socialisation; short, rather than long-term {Dickens, 2011 #1;Cattan, 2005 #6}
- Group activities with an educational input {Cattan, 2005 #6}

- One-to-one intervention: senior companion/mentoring service {Hagan, 2014 #4}
- Interventions addressing maladaptive social cognition (focus on quality of social interactions) {Masi, 2011 #5}

Little evidence

- Use of new technologies, such as web-based communication , a games console, or a real or synthetic pet (results however variable, 3 out of 6 studies no results) {Hagan, 2014 #4}
- interactive, online program that incorporated health information, support groups, chat rooms or discussion boards {Morris, 2014 #2}

Interventions no effect

- Internet training {Dickens, 2011 #1}
- One-to-one intervention: home visiting {Cattan, 2005 #6}
- Time limited group interventions (6-12 weeks) {Hagan, 2014 #4}

Author	Design	Conclusions
Dickens (2011)	systematic review	More, well-conducted studies of the effectiveness of social interventions for alleviating social isolation are needed to improve the evidence base. However, it appeared that common characteristics of effective interventions were those developed within the context of a theoretical basis, and those offering social activity and/or support within a group format. Interventions in which older people are active participants also appeared more likely to be effective. Future interventions incorporating all of these characteristics may therefore be more successful in targeting social isolation in older people. 32 studies (16 RCT and 16 quasi-exp), 7 studies evaluated activity interventions, 15 evaluated support interventions, 5 evaluated home visiting, 4 evaluated internet training, 1 evaluated a service provision intervention (Moderate and high risk of bias).
Hagan (2014)	systematic search and narrative review	17 studies There was limited evidence of the effectiveness of one-to-one interventions on the basis of the three studies examined. One structured group work intervention was found to be effective. The highlight of this review, however, was that three of the four interventions demonstrating measurable effect on reducing loneliness amongst older people involved introducing new technologies. Whilst these studies reported relatively small numbers and may not be generalizable to a larger population, these investigations do highlight the need for further research to be conducted in this particular area.
Cattan (2005)	Systematic review	Nine of the 10 effective interventions were group activities with an educational or support input. Six of the eight ineffective interventions provided one-to-one social support, advice and information, or health-needs assessment. The review suggests that educational and social activity group interventions that target specific groups can alleviate social isolation and loneliness among older people. The effectiveness of home visiting and befriending schemes remains unclear.
Findlay (2003)	review	survey of 17 interventions found a single one-to-one intervention, involving informal referrals to other services, significantly effective but hypothesised that group interventions were more likely to be effective if they were at least 5 months in duration.
Morris (2014)	Systematic review	Smart technologies, such as tailored internet programs, may help older people better manage and understand various health conditions, resulting in subsequent improvements in aspects of social connectedness. Further research is required regarding how technological innovations could be promoted, marketed and implemented to benefit older people.

		18 studies
Masi (2011)	Meta-analyses	Moderator analysis demonstrated that, among the randomized studies, interventions that addressed maladaptive social cognition had a larger mean effect size compared to interventions that addressed social support, social skills, and opportunities for social intervention. 50 studies

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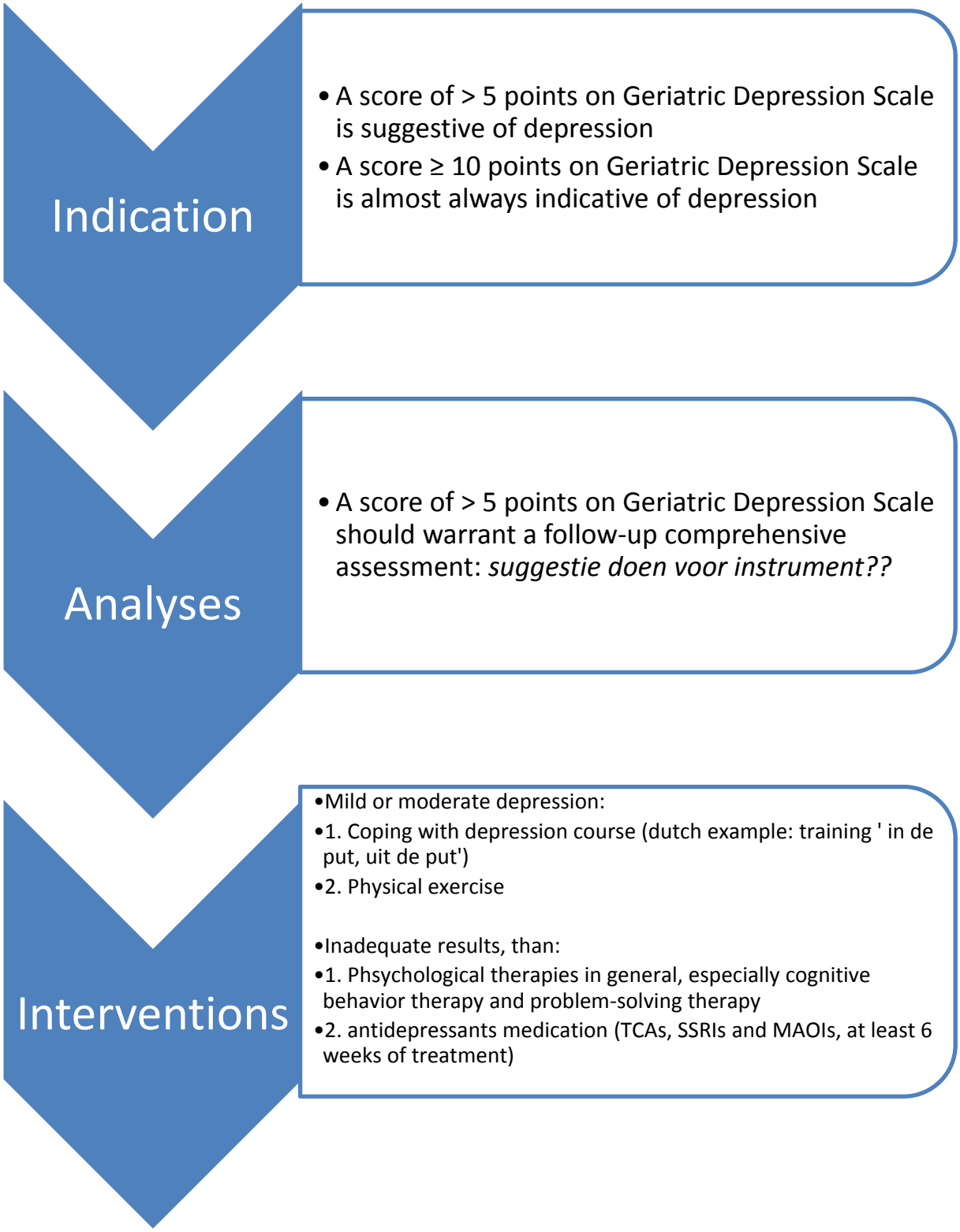
DEPRESSION


Indication
• A score of > 5 points on Geriatric Depression Scale is suggestive of depression
• A score ≥ 10 points on Geriatric Depression Scale is almost always indicative of depression
Analyses
• A score of > 5 points on Geriatric Depression Scale should warrant a follow-up comprehensive assessment: *suggestie doen voor instrument??*
Interventions
•Mild or moderate depression:
•1. Coping with depression course (dutch example: training ' in de put, uit de put')
•2. Physical exercise
•Inadequate results, than:
•1. Phsychological therapies in general, especially cognitive behavior therapy and problem-solving therapy
•2. antidepressants medication (TCAs, SSRIs and MAOIs, at least 6 weeks of treatment)

Objective

- to decrease symptoms of depression, like gloomy mood, or recover from depression
- to improve daily functioning (like self-care)

Screening

Geriatric Depression Scale (GDS) {Yesavage, 1982 #16}

Diagnostic

Interventions

According to the guidelines of depression in older adults, elderly with mild to moderate depression should be treated with minimal interventions, like physical therapy, coping with depression, and lifestyle advises. If there are inadequate results, antidepressants medication or psychological therapy should be considered (dependent of preference of patient and availability of interventions). It is recommended to start with antidepressants medication in case of severe or psychotic depression {Trimbos-Instituut, 2008 #7}.

Evidence based interventions

- Coping with depression course (Dutch example: Training 'in de put, uit de put') {Cuijpers, 2009 #9}

- psychological therapies in general, especially cognitive behavior therapy and problem-solving therapy {Cuijpers, 2014 #8;Francis, 2013 #10;Wilson, 2008 #6}

- TCAs (Tricyclic antidepressants), SSRIs (selective serotonin reuptake inhibitors) and MAOIs (Monoamine oxidase inhibitors and related antidepressants). At least six weeks of antidepressant treatment {Wilson, 2001 #5}

- small to moderate side effects of psychotherapy for depression on social functioning {Renner, 2014 #11}

- (physical) Exercises {Cooney, 2013 #12;Nyer, 2013 #13;Mura, 2013 #14;Bridle, 2012 #15}, such as:
    - Aerobic supervised exercise
    - Strengthening exercise
    - Supervised progressive resistance training

Interventions not effective

- Continuing antidepressant medication in the prevention of recurrence of depression {Wilkinson, 2012 #4}.

- electroconvulsive therapy (ECT) {Van der Wurff, 2003 #3}.

Side effects medication

Our findings suggest that SSRIs (selective serotonin reuptake inhibitors) and TCAs (Tricyclic antidepressants) are of the same efficacy. However, we have found some evidence suggesting that TCA related antidepressants and classical TCAs have different side effect profiles and are associated with differing withdrawal rates when compared with SSRIs. The review suggests that classical TCAs are associated with a higher withdrawal rate due to side effect experience, although these results must be interpreted with caution due to the heterogeneity of the drugs and patient populations {Mottram, 2006 #2}.

Author	Design	Conclusions
Wilson (2001)	Cochrane review	TCAs (Tricyclic antidepressants), SSRIs (selective serotonin reuptake inhibitors) and MAOIs (Monoamine oxidase inhibitors and related antidepressants) are effective in the treatment of depression in older community patients. At least six weeks of antidepressant treatment is recommended to achieve optimal therapeutic effect. 17 trials, 245 patients treated with Tricyclic antidepressants (223 with placebo), 365 patients treated with SSRIs (372 with placebo) and 58 patients treated with MAOIs (63 with placebo).
Wilson (2008)	Cochrane review	Only a small number of studies and patients were included in the meta-analysis. If taken on their own merit, the findings do not provide strong support for psychotherapeutic treatments in the management of depression in older people. However, the findings do reflect those of a larger meta-analysis that included patients with broader age ranges, suggesting that CBT may be of potential benefit 9 trials of cognitive behavioural and psychodynamic therapy approaches. 5 trials (153 participants), cognitive behavioural therapy was more effective than waiting list controls (WMD -9.85, 95% CI -11.97 to -7.73). 3 trials with usable data, CBT was superior to active control interventions when using the Hamilton Depression Rating Scale (WMD -5.69, 95% CI -11.04 to -0.35), but equivalent when using the Geriatric Depression Scale (WMD -2.00, 95% CI -5.31 to 1.32).
Cuijpers (2009)	Systematic review (meta-analyses)	Coping with depression is effective in the prevention of new cases of major depressive disorders, in those who did not meet criteria for such a disorder at baseline. Those who participated in a preventive version of the CWD had 38% less chance of developing a major depressive disorder than those who did not participate ($p<0.05$) . The efficacy of the CWD has been examined in 25 randomized controlled trials. We conducted a meta-analysis of these studies. 6 studies aimed at the prevention of new cases of major Depression, 18 studies examining the CWD as a treatment of depression
Cuijpers (2014)	Systematic review (updated meta-analyses)	We conclude that it is safe to assume that psychological therapies in general are effective in late-life depression, and this is especially well-established for cognitive behavior therapy and problem-solving therapy. 44 studies comparing psychotherapies to control groups, other therapies or pharmacotherapy. overall effect size indicating the difference between psychotherapy and control groups was g = 0.64 (95% CI: 0.47–0.80), which corresponds with a NNT of 3. These effects were maintained at 6months or longer post randomization (g = 0.27; 95%CI: 0.16–0.37). Specific types of psychotherapies that were found to be effective included cognitive behavior therapy (g = 0.45; 95% CI: 0.29–0.60), life review therapy (g =

		0.59; 95% CI: 0.36–0.82) and problem-solving therapy (g = 0.46; 95% CI: 0.18–0.74). Studies with lower quality resulted in higher effect sizes thanhigh-quality studies ($p < 0.05$).
Mottram (2006)	Cochrane review	32 trials Our findings suggest that SSRIs and TCAs are of the same efficacy. However, we have found some evidence suggesting that TCA related antidepressants and classical TCAs have different side effect profiles and are associated with differing withdrawal rates when compared with SSRIs. The review suggests that classical TCAs are associated with a higher withdrawal rate due to side effect experience, although these results must be interpreted with caution due to the heterogeneity of the drugs and patient populations.
Van der Wurff (2003)	Cochrane review	4 trials None of the objectives of this review could be adequately tested because of the lack of firm, randomised evidence. Given the specific problems in the treatment of depressed elderly, a well designed randomised controlled trial should be conducted in which the efficacy of ECT is compared to one or more antidepressants.
Wilkinson (2012)	Cochrane review	7 trails The long-term benefits of continuing antidepressant medication in the prevention of recurrence of depression in older people are not clear and no firm treatment recommendations can be made on the basis of this review. Continuing antidepressant medication for 12 months appears to be helpful but this is based on only three small studies with relatively few participants using differing classes of antidepressants in clinically heterogeneous populations. Comparisons at other time points did not reach statistical significance. Data on psychological therapies and combined treatments are too limited to draw any conclusions.
Francis (2013)	review	17 trials Results indicate that all psychological interventions reviewed were effective in reducing depressive symptoms in older adults. Future research should include larger sample sizes and focus on moderators of treatment such as age, depression severity, medical illness, and cognitive impairment.
Renner (2014)	Review (meta-analyses)	Psychotherapy for depression results in small to moderate improvements in social functioning, before [Hedges' g=0.46, 95% confidence interval (CI) 0.32–0.60] and after adjusting for publication bias (g=0.40, 95% CI 0.25–0.55). These improvements are strongly associated with, but not fully explained by, improvements in depressive symptoms. Only studies that compared psychotherapy to a control condition were included (31 studies with 2956 patients).
Cooney (2013)	Cochrane review	Exercise is moderately more effective than a control intervention for reducing symptoms of depression, but analysis of methodologically robust trials only shows a smaller effect in favour of exercise. When compared to psychological or pharmacological therapies, exercise appears to be no more effective, though this conclusion is based on a few small trials. For the 35 trials (1356 participants) comparing exercise with no treatment or a control intervention, the pooled SMD for the primary outcome of depression at the end of treatment was -0.62 (95% confidence interval (CI) -0.81 to -0.42), indicating a moderate clinical effect. There was moderate heterogeneity ($I^2 = 63\%$). When we included only the six trials (464 participants) with adequate allocation concealment, intention-to-treat analysis and blinded outcome assessment, the pooled SMD for this outcome was not statistically significant (-0.18, 95% CI -0.47 to 0.11). Pooled data from the eight trials (377 participants) providing long-term follow-up data on mood found a small effect in favour of exercise (SMD -0.33, 95% CI -0.63 to -0.03). Seven trials compared exercise with psychological therapy (189 participants), and found no significant difference (SMD -0.03, 95% CI -0.32 to 0.26). Four trials (n = 300) compared exercise with pharmacological treatment and found no significant difference (SMD -0.11, -0.34, 0.12). One trial (n = 18) reported that exercise was more effective than bright light therapy (MD

		-6.40, 95% CI -10.20 to -2.60).
Neyer (2013)	review	Physical exercise may be effective in relieving symptoms of mild to moderate depression in older adults. Despite the promising results of previous studies, methodological problems, such as small sample size, varying definitions of depression, and insufficient follow-up data, limit existing findings. Further well-controlled studies are required comparing the effects of different forms of exercise on late-life depression.
Mura (2013)	Review	In the last 20 years, few progresses were done in showing the efficacy of exercise on depression, due in part to the persistent lack of high quality research, in part to clinical issues of management of depression in late life, in part to the difficult to establish the real effectiveness of exercise on depressive symptoms in elderlies. However, there are some promising findings on physical activity combined with antidepressants in treatment resistant late life depression. 44 papers were retrieved by the search. Among the 10 included randomized controlled trials, treatment allocation was adequately conceived in 4 studies, intention-to-treat analysis was performed in 6 studies, but no study had a double-blinded assessment.
Bridle (2012)	Systematic review and meta-analyses	Our findings suggest that, for older people who present with clinically meaningful symptoms of depression, prescribing structured exercise tailored to individual ability will reduce depression severity. 9 trials met inclusion criteria and 7 were meta-analysed. Exercise was associated with significantly lower depression severity (standardised mean difference (SMD) =70.34, 95% CI 70.52 to 70.17), irrespective of whether participant eligibility was determined by clinical diagnosis (SMD =70.38, 95% CI 70.67 to 70.10) or symptom checklist (SMD =70.34, 95% CI 70.62 to 70.06). Results remained significant in sensitivity analyses.

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COGNITION

Indication

- A score of ≤ 23 on Mini-Mental State Exam

Analyses

Interventions

- 1. Combined cognitive and exercise interventions on general cognitive functions, memory and functional status for cognitive health

- moderate evidence:
- 2. moderate level physical activity

- little evidence:
- 3. Memory training
- 4. Aerobic exercise intervention

Objective

- To increase cognitive functions

Screening

Mini-mental state examination (MMSE) [1]

Diagnostic

Interventions

Evidence based interventions

- Combined cognitive and exercise interventions on general cognitive functions, memory and functional status for cognitive health older adults [2]

Moderate evidence

- Moderate-level physical activity (no specific type determined) to order to improve cognitive function and delay the onset of debilitating cognitive disease in older persons [3]

Little evidence

- Memory training for healthy older adults and individuals with mild cognitive impairment in relation to immediate and delayed verbal recall [4]
- Aerobic exercise intervention in relation to cognitive speed, auditory and visual attention [5]

Interventions no effect

Author	Design	Conclusions
Angevaren (2008)	Cochrane review	11 RCT's of aerobic physical activity programmes for healthy people over the age of 55 years have been included in this review. Eight of these 11 studies reported that aerobic exercise interventions resulted in increased fitness of the trained group and an improvement in at least one aspect of cognitive function. The largest effects were on cognitive speed, auditory and visual attention. However, the cognitive functions which improved were not the same in each study and the majority of comparisons yielded no significant results. The data are insufficient to show that the improvements in cognitive function which can be attributed to physical exercise are due to improvements in cardiovascular fitness.
Martin (2011)	Cochrane review	The results suggest that cognitive interventions do lead to performance improvements and that the size of the effects differs for different kinds of memory skills in healthy older adults and people with mild cognitive impairment. In particular, immediate and delayed verbal recall improved

		significantly through training compared to a no-treatment control condition but the improvements observed did not exceed the improvement in the active control conditions. 36 RCT's
Carvalho (2014)	Systematic review	The preponderance of evidence suggests that physical activity is beneficial for cognitive function in the elderly. 26 of 27 studies showed a significant association between physical activity and cognitive decline, whereby an increased level of physical activity resulted in attenuation of cognitive decline and cognitive disease. However, the majority of the evidence is of medium quality with a moderate risk of bias. Larger randomized controlled trials are needed to clarify the association between exercise and cognitive function and to determine which types of exercise have the greatest benefit on specific cognitive domains. Despite these caveats, the current evidence suggests that physical activity may help to improve cognitive function and, consequently, delay the progression of cognitive impairment in the elderly. 27 studies (15 prospective cohorts, 10 RCTs, 1 case-control study, and 1 observational study)
Law (2014)	Systematic review	In conclusion, combined cognitive and exercise training can be effective for improving the cognitive functions and functional status of older adults with and without cognitive impairment. How-ever, limited evidence can be found in populations with cognitive impairment when the evaluation includes an active control group comparison. More well-designed studies are required before one can draw any firm conclusion on the efficacy of the combined cognitive and exercise intervention in older adults.

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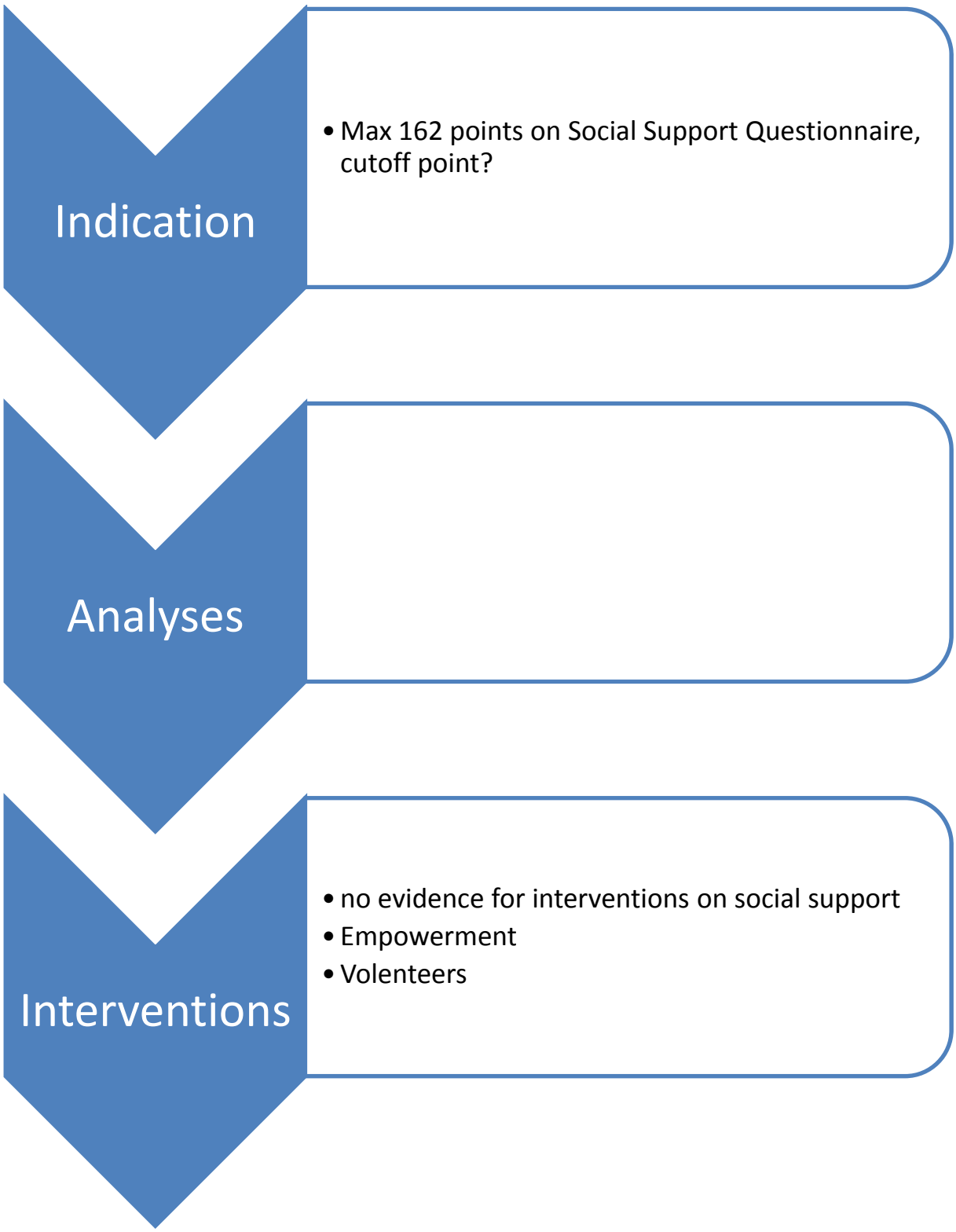
SOCIAL SUPPORT



Annex 4: Focus group numbers

City	Focus group	interview	participants		Policymaker	10
Rijeka	Professionals		8		Elderly	60
Rijeka	Elderly		6		informal caregivers	23
Rijeka	Elderly		5		professionals	47
Rijeka		Policymaker	1		**Total participants**	**140**
Rijeka		Policymaker	1	21		
Pallini	Elderly		7			
Pallini	Elderly		7			
Pallini	informal care givers		2			
Pallini	informal care givers		4			
Pallini	Professionals		4			
Pallini	Professionals		3			
Pallini		Policymaker	1			
Pallini		Policymaker	1			
Pallini		Policymaker	1	30		
Rotterdam	Elderly		10			
Rotterdam	Elderly		8			
Rotterdam	informal care givers		5	23		
Manchester	Professionals		5			
Manchester	Professionals		4			
Manchester	informal care givers		7			
Manchester	informal care givers		5			
Manchester		Policymaker	1			
Manchester		Policymaker	1			
Manchester		Policymaker	1			
Manchester		Policymaker	1			
Manchester	Elderly		6	31		
Manchester		Policymaker	1			
Valancia	Professionals		2			
Valancia	Professionals		6			
Valancia	Elderly		3			
Valancia	Elderly		8			
Valancia	Professionals		7			
Valancia	Professionals		8	35		
			140			

Annex 5: Labels focus group interviews elderly

Elderly
family
Healthy Lifestyle
Love
Exercise
active
skiing
work
alone
medication
healthy food
cell phone
computer physical fitness
doctor
mental awareness
risk falling
fear of death
one doctor
friends
society
education
pay
exercise
harmonies life
pets
nature
lonely
alone
no need for help
club
is there no one you can rely on
medication information
moving
internet
recommendation moving, exercise
using the internet
education
polypharmacy
my children
people have lot of problems
peace and love
500€ pension
cost medication
financial crises
poor people
elderly at home
no professionals
mobilising yourself
financial problems

stress
human relations
disability
our children need our help now
we need people to help us
we start crying for help
love
family network
listen to your needs
You need to be strong
i am afraid of walking
i feel bored
spouse
home care team
less money\
afraid of dying
exercise
medication
loneliness
fear of loneliness
missing people own generation
wanking less
living alone
elderly are garbage
family
falling
using IPad
exercise
money important
loneliness
medication
home hospitalisation
feel useful;
les walking
risk falling
pension
children

Annex 6: Labels focus group interviews informal caregivers

Needs for help
extremely stressed
family
medication
falling
distance
It is the family and the dearest person that can take care of such cases
money
exercise
not to give up
difficult to adapt to a new environment
insecure
don't except help
expecting some specialist
friends
we want citizens to be informed
being alone
need care for the carer
feel insecure
we need more information
Sickness has no working hours
mobile phones
we need that touch
feeling safe
human contact
family ties still strong in Greece
Greek society is in transition
she lives nearby and she helps a lot
you are not alone
falling
Risk of falling
the carer burns out
polypharmacy
money is important
elderly live at home
loneliness
computers are for young people
care at home
friends are important
love is the most important of all
organized care
she feels secure
we need someone

elderly people are selfish
Need more money
in short the state doesn't care
falling
homecare
exercise
medication
les care
surroundings imprtant
frailty and falling over
to be able to help them
cost involved
trust in het home
data protection
less money
family important
lonely
robot
exercise and dance
polypharmacy
health and social carte
emotional
family important
been there dune that
less money
lost off balance
sandwich generation
taking back my life bit by bit

Annex 7: Labels focus group interviews professionals

Prayer community
Active social life
Loneliness
medication
family
Not listening
stubborn
Falling at home
accept
paperwork
relationship
Hospitalization
Less time
Need entertainment
exercise
bus transportation free
corner shops
small pension
educated
volunteers
be able to respond to the persons needs
i refer to the family environment
role in prevention
social workers
less money
Loneliness
heath and social care professionals need support carers
a continuum of care
need registration elderly
social pharmacy
informal care
family
less money
integrated care network
use telephone
the home care program was terminated
social care has fixed needs
family
loneliness
love
organize itself better at a local level
caring for the elderly is hard
the level of emotional attachment to the elderly is important

empowerment
Budget
There is a huge gab information
les money
wrong culture
active citizens
the network must be flexible
companionship
bonding
exercise
better salary
working more hours
burn out
falling
medication confused
loneliness
using internet skype
isolation
family
relationship important
exercise
high cost
less money
pressure on other services
communication
more workload
relying on technology
informal care
future need of the elderly
multi-disciplinary team
less money
medication
important filling the afternoon
take care of them
falling
it is like a duty it feels like a duty
information
frustration
fewer health care
medication
handgrip bars
active medication exercise
employment
new technologies
loneliness
expensive

fall
manage the social issues
cost
communication
handle new technology
money
support for caregivers
preventive

Annex 8: Labels interviews policymakers

environment
activity's in the city
accessibility
polypharmacy
less money
volunteers
more elderly
Home nurse important
palliative care
hospital at home
exercise
municipal infrastructure
huge new needs
citizens cannot afford a visit
money less
poverty
mobilize the active
the financial crisis
volunteer doctors
health education
prevention
less money
volunteers
need dental care
medication
falling
loneliness
much that move into caring people
loneliness and isolation
less money
family
frail elderly