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What is the effectiveness of home visiting or home-based support for older people?

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EVIDENCE FOR DECISION-MAKERS

ABSTRACT

This is a Health Evidence Network (HEN) synthesis report on the evidence of the effectiveness of home visiting or home-based support for older people. The vast majority of older people wish to remain living in their own homes. Furthermore, institutional care is costly. Consequently there are social and economic imperatives to prevent ill-health and disability in older people and enable them to remain in their own homes as long as possible. Home visiting and home-based support are interventions that may be used to these ends.

Evidence shows that home visits can reduce mortality and nursing home admissions in some groups of older people. Characteristics of effective home-visiting programmes include multidimensional assessment, many follow-up visits and targeting people at lower risk of death.

HEN, initiated and coordinated by the WHO Regional Office for Europe, is an information service for public health and health care decision-makers in the WHO European Region. Other interested parties might also benefit from HEN.

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Summary

The issue

The vast majority of older people wish to remain living in their own homes. Furthermore, institutional care is costly. Consequently there are social and economic imperatives to prevent ill-health and disability in older people and enable them to remain in their own homes as long as possible. Home visiting and home-based support are interventions that may be used to these ends.

Previous reviews of the effectiveness of home visiting programmes for older people appear to have produced inconsistent and conflicting results. This synthesis has critically appraised all reviews related to home visiting to determine consistent findings.

Findings

There is consistent evidence that home visits could reduce mortality and nursing home admissions. There is some evidence that the reduction in mortality may be greater among the younger elderly, and that nursing home admissions may be reduced to a greater extent with a greater number of visits. Home visiting has not been shown to reduce functional decline, except amongst those with a low mortality rate and in programmes providing multi-dimensional geriatric assessment and follow up. Home visiting programmes have the potential to be cost-effective due to their low cost compared to long-term institutional care.

Policy considerations

Evidence shows that home visits can reduce mortality and nursing home admissions in some groups of older people. Characteristics of effective home-visiting programmes include multidimensional assessment, many follow-up visits and targeting people at lower risk of death.

Further research is required to determine:

- which aspects of multifaceted interventions are responsible for beneficial effects
- the effectiveness of different professionals and volunteers
- the optimal number and duration of home visits
- which groups of older people are most likely to benefit from home visits
- the costs and benefits of a programme within the local health care system
- the effectiveness of home visiting programmes among less affluent populations.

This review does not provide evidence for stopping existing home-visiting programmes, but further research is required to answer the questions outlined above prior to implementing new programmes.

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Introduction

Throughout Europe, projected increases in the numbers of older people and demographic changes pose challenges to medical and social care systems. Declining long-stay provision in hospitals and shorter acute inpatient stays have increased pressure on primary and community care services *(1, 2, 3)* In the United Kingdom, the number of places in residential nursing homes for older people doubled between 1980 and 1995 (*[3]*).

Disability and ill health are not inevitable consequences of ageing. Many older people enjoy good health well into old age and the vast majority wish to remain living independently in their own homes for as long as possible *(4)*. Older people who have been admitted into long-term residential care may regret that community-based options have not been more fully explored *(5)*.

Institutional care, in either hospitals or nursing homes, is costly. For policy-makers, preventing ill-health and disability, thereby enabling older people to remain for as long as possible in their own homes in the community, has become both an economic and social priority *(4)*.

The scope of this synthesis

Interventions involving home visiting or the provision of home-based support include a large array of services with different aims and purposes. Home care services have been classified into five types: preventive-promotive, therapeutic, rehabilitative, long-term maintenance, and palliative *(6)*. This synthesis addresses only preventive-promotive interventions that aim to prolong survival, prevent or postpone disabilities, or maintain or improve functioning.

Sources for this review

This synthesis is based on systematic reviews, meta-analyses and meta-regression analyses of the effectiveness of home visiting to older people. The following databases were searched:

- Cochrane Database of Systematic Reviews

- Database of Abstracts of Reviews of Effects (CRD/DARE)
- Health Technology Assessment Database (CRD)
- Cochrane Controlled Trials Register
- Medline
- CINAHL
- Embase
- British Nursing Index

Combinations of the following terms were used in search strategies:

- Community health nursing (health visitors, visiting nurses, visiting doctors/physicians, visiting volunteers)
- Home visiting (home visits, in-home visiting, domiciliary visits)
- Older people (old people, aged, elderly people, elders, seniors)
- Prevention (screening, assessment, health education, health promotion)

Included and excluded systematic reviews

Only systematic reviews written in English, conducted after 1990 of preventive/promotive interventions were included. The reviews had to assess the effectiveness of one or more home visits to older people by health professionals or volunteers and evaluate one or more of the following outcomes: survival, admissions to nursing homes, or functional status. Older people had to be at least 60 years of age. Although falls are the leading cause of mortality due to injury in people aged over 75, and a leading precipitating cause of nursing home admissions, systematic reviews of home visiting trials that aimed to reduce falls or fall-related injuries have been evaluated separately *(7, 8, 9)* and are not within the scope of this review. The reviews excluded from this synthesis are listed in appendix 1.

Findings

There have been four systematic reviews of the effects of home visits to older people *(10, 11, 12, 13).* The primary studies included in all four systematic reviews employed a range of personnel to carry out home visits, including physicians, nurses, professionals allied to medicine and volunteers. The home visitors carried out a variety of activities, from health needs assessment and monitoring, to the provision of information, referral to other services, counselling and emotional support.

There was overlap in the primary studies included in each systematic review, but different questions and analyses were considered in each. This section will present the results from each systematic review individually. Later sections will discuss the apparent inconsistencies among reviews.

Stuck and colleagues (1993), undertook a meta-analysis of 28 controlled trials of comprehensive geriatric assessment *(10)*.[1] The assessments took place in institutional and non-institutional settings. Six of the 28 trials involved preventive home visits to older people (see appendix 2). Meta-analysis combining the results of all six trials showed no effect on mortality at 12 or 24 months. However, there was a significant reduction in mortality at 36 months. There was also a significant reduction in mortality at 36 months for living at home, versus nursing home placement. The reviewers concluded that some types of comprehensive geriatric assessment were associated with favourable outcomes, but they were unclear about which specific aspects of the interventions were effective.

Van Haastregt and colleagues *(11)* undertook a narrative systematic review in 2000 of 15 trials conducted in Europe and North America of preventive home visits to older people living at home *(11),*

[1] Stuck et al (10) define comprehensive geriatric assessment as a procedure "determining an elderly person's medical, psychosocial, functional and environmental resources and problems, linked with an overall plan for treatment and follow-up."

including the six studies from Stuck, 1993 and an additional eight studies (see appendix 3). Significant favourable effects of home visiting were reported in only three out of 13 trials measuring mortality, two out of seven measuring admission to institutions, and five out of 12 trials measuring physical functioning. The reviewers concluded that findings of effectiveness of home visits were "modest and inconsistent"*(11)*; however, no meta-analyses were performed.

Also drawing on European and North American studies, Elkan and colleagues *(12)* undertook a systematic review and meta-analysis of 15 trials of home visiting interventions offering health promotion and preventive care in 2001, including 8 of the 15 studies from van Haastregt, 2000 (see appendix 4). The studies were grouped into those in which the intervention was delivered to members of the general elderly population, and those in which it was targeted at frail older people who were at risk[2] of adverse outcomes. Meta-analysis showed significant reductions in mortality and admissions to nursing homes in both populations. These benefits were achieved regardless of the age of the population and duration of the intervention. Meta-analysis of studies of the general elderly population showed no significant effect on functional status.

In 2002, a further systematic review was carried out by Stuck and colleagues *(13)*, who conducted a meta-analysis and meta-regression analysis of 18 European and North American trials to evaluate the effect of preventive home visits on nursing home admissions, mortality, and functional status, including 11 of the 15 studies from van Haastregt, 2000 (see appendix 5). Meta-analysis showed no overall significant reduction in nursing home admissions. However, meta-regression suggested that this effect was related to the number of home visits carried out during follow-up. In trials where more than nine visits took place, there was a significant reduction in admissions, but in trials where four or fewer home visits took place there was no such reduction. Overall, when studies were combined in a meta-analysis, preventive visits appeared to have little effect on functional status. However, meta-regression analysis showed that functional decline was reduced in trials that used multidimensional assessment with follow-up[3], but not in other trials. Functional decline was also reduced in trials where the control group mortality rate was low but not in those where the control group mortality rate was high. Meta-analysis of all the studies showed no overall reduction in mortality. Meta-regressions showed that mortality rates were reduced in younger populations (73 to 78 years old) but not in older populations (80 to 82) *(13)*. The reviewers concluded that preventive home visits appeared to be effective if they were based on multidimensional assessment, involved many follow-up home visits and targeted people at lower risk for death.

Conflicting results

The reviews performed by Elkan and colleagues *(12)* and Stuck and colleagues *(10,13)* found home visiting to be effective for some outcomes. This contrasted with the findings of the review undertaken by van Haastregt and colleagues *(11)*, which reported no consistent evidence of effectiveness for any outcome. An important reason for the discrepancy is the different methodological approaches adopted. Van Haastregt and colleagues reported results from individual trials as either "significant" or "not significant". The other two sets of researchers combined the results of studies and used meta-analysis to summarize results *(14)* (See also below: "Discussion of the strength of the evidence used in the synthesis").

There are several differences between Stuck et al.'s 2002 findings *(13)* and those of Elkan et al. *(12)*. First, Elkan's meta-analysis combining all the trials showed overall reductions in nursing home admissions, whereas Stuck's did not. However, Stuck et al.'s meta-regression analysis showed a reduction in nursing home admissions for some interventions with more than nine visits. Second,

[2] Those considered at risk were older people who had recently been discharged from hospital who were at risk of further admissions, and frail older people who had been referred to home care agencies. (12)

[3] Home visiting programmes were classified as based on multidimensional assessment and follow-up if they included "a systematic evaluation of medical, functional, psychosocial, and environmental domains and follow-up for the implementation of the intervention plan". (11)

neither Stuck's nor Elkan's meta-analysis of all the trials showed any effect on functional status. However, Stuck's meta-regression analysis showed beneficial effects in delaying functional decline for multi-dimensional assessments with follow-up, and for sub-groups of older people at lower risk of death. Third, Elkan's meta-regressions suggested that the age of participants had no effect on mortality. By contrast Stuck found age to be associated with mortality: home visits extended survival in those aged 73-78 but not those aged 81-82.

One reason for the discrepancies in the two sets of reviewers' findings is that Stuck et al. entered more trials into their meta-analysis and meta-regressions than did Elkan et al. In relation to nursing home admissions the two sets of reviewers performed meta-regressions using different predictors (duration versus number and intensity of visits), which may explain their differing findings. They also used different inclusion criteria: Stuck et al. included only randomized controlled trials, whereas Elkan et al. also included quasi-randomized studies. Finally, Elkan et al. included preventive home visits to patients recently discharged from hospital, whereas Stuck et al. did not. All of these differences may account for discrepancies in the two sets of findings.

Gaps in evidence

Most studies of home visiting have been conducted with older people living in more affluent areas who are of predominantly higher socio-economic status *(15)*. *Low* income amongst the elderly is associated with a higher prevalence of, and more severe, disability *(16, 17)*. In addition, the ability to remain at home may partly depend on income and ability to pay for extra support and care at home. Home visiting programmes may therefore be less effective in maintaining elderly people at home in less affluent populations.

It is difficult to ascertain the importance of the characteristics of the home visitor for the success of home visiting programmes. There are no studies comparing the effectiveness of the same programme delivered by different types of personnel. There is evidence from a single trial that the skills of staff are important. Stuck and colleagues report a finding from their own RCT that performance among nurses varied greatly and influenced whether or not the programme yielded favourable effects *(18)*. Although Stuck *(16)* asserts that effective preventive programmes need professional staff, and are not compatible with home visits conducted by inexpensive volunteers having mainly social contacts with older people, there is little research to help answer this question. Only four trials of preventive home visits undertaken by volunteers have been included in any systematic review *(19,20,21,22)*, of which three reported some significant effects *(19,21,22)*.

Many of the evaluated programmes were multi-faceted, providing not only home visits but also other elements, such as increased contacts with local health clinics or other community services. It is therefore often difficult to discern the particular contribution of home visiting. In addition, even where it is possible to attribute effectiveness to the home visits, it is difficult to know which of their components had the greatest effect. Although the meta-regression analyses by Stuck and colleagues *(13)* found that effective home visiting programmes included multidimensional assessment, many follow-up home visits and targeting people at lower risk for death, other factors may also be important. As yet, no trial assessing multiple outcomes has been designed to study the additional benefits of single components of the home visit for particular outcomes. Furthermore, most published accounts of interventions provide only brief descriptions of what the home visitor did, giving the reader little feel for the processes involved and making replication of the programme difficult in practice.

There are few studies incorporating long-term follow-up, so it is difficult to ascertain if post-programme gains are sustained.

Discussion of the strength of the evidence used in the synthesis

All the evidence used in this synthesis comes from published systematic reviews of randomized and quasi-randomized controlled trials. RCTs are the most rigorous method of assessing effectiveness *(23)*, followed by quasi-randomized controlled trials which are often used to evaluate organizational interventions *(24)*. Some authors argue, however, that while controlled trials may be the best method of evaluating a strictly clinical intervention, they may be inadequate or inappropriate for evaluating a home visiting service, which may be more a social process than a treatment programme *(25)*. While qualitative or action research may be useful adjuncts to RCTs for providing detailed descriptions of what home visitors do, and generating ideas about the key elements of an effective intervention, we have been unable to find any reviews of qualitative research in the field of home visiting programmes for the elderly.

Some of the systematic reviews contained in this synthesis employed meta-analysis, whereas others did not. Narrative reviews and meta-analyses both have their advantages and limitations *(26)*. Van Haastregt and colleagues decided that given the heterogeneity of the interventions in their own review, pooling the data might lead to "oversimplified conclusions" *(11)*. In contrast, Elkan and Stuck decided that only by pooling the data was it possible to estimate effect sizes that cannot be determined by assessing individual trials separately.

Both Elkan *(12)* and Stuck *(13)* include meta-regression analysis. Meta-regression and sub-group analyses should be regarded as exploratory analyses, which are particularly useful for generating hypotheses. Associations between study characteristics and outcomes can occur by chance or can be due to the presence of confounding factors. In addition, as the necessary data may not be available from all reviewed studies, the characteristics of studies (and participants) included and excluded from the meta-regression may differ. For example, if data on risk of nursing home admission were available only for trials including more elderly patients or those with a more intensive intervention, conclusions regarding the relationship between risk of nursing home admission and the outcome may be confounded by age or intensity of the intervention. Aggregation bias can also occur where the relationship between patients' characteristics and outcomes at the study level do not reflect the relationship at the level of individual patients *(27)*. The findings from meta-regression analyses should therefore be interpreted with *(28)*.

Discussion of other aspects

Issues related to costs and cost-effectiveness

The effectiveness of home visits remains a matter of uncertainty and this means that cost-effectiveness is also uncertain. Stuck et al.'s 2002 review *(13)* assessed the cost of nursing home admission, citing Dickinson's 1996 estimate *(29)* that the lifetime cost for a person admitted to long-term care in a United Kingdom nursing home is GB£ 42 250 (US$ 65 000). On the basis of their findings they suggested 40 older people would need to receive a home visiting programme with frequent follow-up visits to prevent one nursing home admission. Therefore, they concluded that programmes with expenditures of less than US$ 1500 per participant could reduce costs. On the basis of the findings of their own trial *(18)* Stuck et al. suggested that preventive home visits required an initial investment of approximately US$ 400 per person in the first year to produce net savings of US$ 1400 per person annually in the third year.

Potential social implications

There are concerns about the acceptability and perceived usefulness of home visits by older people themselves. Three studies reviewed by Elkan et al. discussed client satisfaction. In one, levels of satisfaction were significantly higher in the intervention group *(30)*; in the second, levels were

virtually identical in intervention and control groups *(31),* but in the third although 95 of the 100 older women responded that they had enjoyed the home visits, only 48 said they would wish to continue to receive visits if it were possible *(32).* Many considered that they did not "need" home visits, or that others were more deserving of visits than they were. This suggests that while home visits are acceptable to older people, they may not see them as a priority.

The generalizability of the findings among countries

Almost all the trials compared a home visiting intervention with "usual" or "routine" care. However, "usual care" differs greatly among health-care systems, making it difficult to apply conclusions from results in one country to another. Few interventions have been replicated in different countries, raising questions about their generalizability or acceptability to different populations and communities.

Conclusions

Reviews of trials of general home visits

A diverse body of evidence exists about home visits, evaluating a range of personnel (physicians, nurses, professions allied to medicine, volunteers) carrying out various interventions (needs assessment and monitoring, provision of information, referral to other services, counselling, emotional support).

The most consistent evidence concerning the effectiveness of home visiting relates to the effect on functional decline. All four reviews included in this synthesis found that home visiting programmes with multiple outcomes delivered to an unselected group of older people did not reduce functional decline**.** One review found functional decline was reduced among those with a low mortality rate and in programmes providing multi-dimensional geriatric assessment and follow up.

Two of four reviews found that home visiting could reduce mortality and nursing home admissions. There is some evidence that the reduction in mortality may be greater among younger than among older elderly persons. There is some evidence that nursing home admissions may be reduced to a greater extent when home visiting programmes involve a larger number of visits. Characteristics of effective home visiting programmes include multidimensional assessment, many follow-up home visits and targeting people at lower risk for death, although other characteristics may also be important.

Future trials of home visiting

Further research is required to establish:

- which aspects of multifaceted interventions are responsible for beneficial effects
- the effectiveness of different professionals and volunteers
- the optimal number and duration of home visits
- which groups of older people are most likely to benefit from home visits
- the costs and benefits of a programme within the local health care system
- the effectiveness of home visiting programmes among less affluent populations.

Future economic evaluations

Although home visiting programmes have the potential to be cost-effective due to the high cost of long-term institutional care, and the comparatively low cost of providing home visiting programmes, economic evaluations are needed to assess the costs and benefits of home visiting versus alternative strategies.

Future policy

This review does not provide evidence to stop existing home visiting programmes. However, further research is required to answer the questions outlined above prior to implementing new ones.

Appendix 1

Excluded reviews and reasons for exclusion

Reference	Description	Reasons for exclusion
Hendrick SC, Koepsell TD, Inui T. Meta-analysis of Home-Care Effects on Mortality and Nursing-Home Placement. *Medical care*. 1989, 27(11):1015-1026	review of 13 studies assessing effects of home care on mortality and nursing home placements	conducted before 1990
Van den Bij AK, Laurant MGH, Wensing M. Effectiveness of physical activity interventions for older adults. *American journal of preventive medicine* 22,2:120-133	evaluates the effects of physical activity interventions among older adults; the single outcome assessed is change in physical activity level; includes 9 home-based interventions	does not include home visits or home-based support
Gillespie LD et al. Interventions for preventing falls in elderly people (Cochrane Review). In: *The Cochrane Library*, Issue 4, 2003. Chichester, United Kingdom: John Wiley & Sons, Ltd.	systematic review and meta-analysis of 62 RCTs designed to assess the effectiveness of fall-prevention programmes	no consistent statement of whether the intervention involved a home visit; findings from programs to prevent falls are included in an earlier HEN report (9) and referenced in this report
Province MA et al. The effects of exercise on falls in elderly patients. A preplanned meta-analysis of the FICSIT trials. *JAMA*, 1995, 273:1341-1347.	meta-analysis of seven studies in the "frailty and injuries: cooperative studies of intervention techniques" trials	interventions do not necessarily involve home visiting; difficulty separating the results of individual studies
Ciliska D et al. A systematic overview of the effectiveness of home visiting as a delivery strategy for public health nursing interventions. *Canadian journal of public health*, 1996, 8:193-198.	overview of 14 studies of home visits to all client groups	only one study of home visiting to older people
Yin T., Zhou Q, Bashford C. Burden on Family members: Caring for frail elderly: a meta-analysis of interventions. *Nursing research*, 2002, 51(3):199-208.	assessment of 18 studies of effectiveness of home visits in decreasing the burden on caregivers	no relevant outcomes

Appendix 2

References to studies of home visiting included in Stuck et al.'s 1993 review *(10)*

Carpenter GI, Demopoulos GR. Screening the elderly in the community. *BMJ*, 1990, 300:1253-1256.

Hendriksen C, Lund E, Stromgard E. Consequences of assessment and intervention among elderly people. *BMJ*, 1984, 289:1522-1524.

Pathy MSJ et al. Randomized trial of case finding and surveillance of elderly people at home. *Lancet*, 1992, 340:890-893.

Sorensen KH, Sivertsen J. Follow-up three years after intervention to relieve unmet medical and social needs of old people. *Comparative gerontology* [B], 1988, 2:85-91.

Vetter NJ, Jones DA, Victor CR. Effect of health visitors working with elderly patients in general practice. *British medical journal.* (Clin Res Ed), 1984, 288:369-372.

Vetter NJ, Lewis PA, Ford D. Can health visitors prevent fractures in elderly people? *BMJ*, 1992, 304:888-890.

Appendix 3

References to studies of home visiting included in van Haastregt et al.'s 2000 review *(11)*

Carpenter GI, Demopoulos GR. Screening the elderly in the community. *BMJ*, 1990, 300:1253-1256.

Fabacher D, et al. An in-home preventive assessment program for independent older adults: a randomized controlled trial. *Journal of the American Geriatric Society*, 1994, 42:630-638.

Hall N et al. Randomized trial of a health promotion program for frail elders. *Canadian journal of aging*, 1992, 11:72-91.

Hendriksen C, Lund E, Stromgard E. Consequences of assessment and intervention among elderly people. *BMJ*, 1984, 289:1522-1524.

Luker KA. Health Visiting and the Elderly. *Nursing times*, 1981, 77:137-140.

McEwan RT et al. Screening elderly people in primary care. *British journal of general practice*, 1990, 40:94-97.

Pathy MSJ et al. Randomized trial of case finding and surveillance of elderly people at home. *Lancet*, 1992, 340:890-893.

Sorensen KH, Sivertsen J. Follow-up three years after intervention to relieve unmet medical and social needs of old people. *Comparative gerontology*, 1988, 2:85-91

Stuck AE et al. A trial of annual comprehensive geriatric assessments for elderly people living in the community. *New England journal of medicine*, 1995, 333:1184-1189.

Tinetti ME et al. A multifactorial intervention to reduce the risk of falling among elderly people living in the community. *New England journal of medicine*, 1994, 331:821-827.

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Vetter NJ, Lewis PA, Ford D. Can health visitors prevent fractures in elderly people? *BMJ*, 1992, 304:888-890.

Wagner EH et al. Preventing disability and falls in older adults: a population-based randomized trial. *American journal of public health*, 1994, 84:1800-1606.

* This study included two trials. Each trial was counted separately.

Appendix 4

References to studies of home visiting included in Elkan and colleagues' 2001 review (*12*)

Archbold PG et al. The PREP system on nursing interventions: a pilot test with families caring for older members. *Research in nursing & health*, 1995, 18:3-16.

Balaban DJ et al. Follow-up study of an urban family medicine home visit program. *Journal of family practice*, 1988, 26:307-312.

Dunn RB et al. Health visitor intervention to reduce days of unplanned hospital re-admission in patients recently discharged from geriatric wards: the results of a randomized controlled study. *Archives of gerontology and geriatrics*, 1994, 18:15-23.

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McEwan RT et al. Screening elderly people in primary care. *British journal of general practice*, 1990, 40:94-97.

Oktay JS, Volland PJ. Post-hospital support program for frail elderly and their caregivers: a quasi-experimental evaluation. *American journal of public health*, 1990, 80:39-46.

Pathy MSJ et al. Randomized trial of case finding and surveillance of elderly people at home. *Lancet*, 1992, 340:890-893.

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Williams IE, Greenwell J, Groom LM. The care of people over 75 years old after discharge from hospital: an evaluation of timetabled visiting by health visitor assistants. Journal of public health medicine, 1992, 14:138-144.

Appendix 5

References to studies of home visiting included in Stuck and colleagues' 2002 review *(13)*

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Clarke M, Clarke SJ, Jagger C. Social intervention and the elderly. *American journal of epidemiology*, 1992, 136:1517-1523.

Fabacher D et al. An in-home preventive assessment program for independent older adults. *Journal of the American Geriatric Society*, 1994, 42:630-638.

Gunner-Svensson F et al. Prevention of relocation of the aged in nursing homes. *Scandinavian journal of primary health care*, 1984, 2:49-56.

Hebert R et al. Efficacy of a nurse-led multidimensional preventive programme for older people at risk of functional decline. *Age and Ageing*, 2001, 30:147-153.

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Newbury JW, Marley JE, Beilby JJ. A randomized controlled trial of the outcome of health assessment of people aged 75 years and over. *Medical journal of Australia*, 2001, 175:104-107.

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