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GENERAL DISCUSSION
The results of the work presented in this thesis shed new light on two important issues for evidence-based general practice care for older people:

1. Feasibility of (proactive) identification of older people with complex problems.
2. Effectiveness of proactive integrated care for older people with complex problems in general practice.

This chapter discusses the implications for theory and general practice and makes some recommendations for future research. The main results regarding the major aims of this thesis are discussed separately below.

FEASIBILITY OF PROACTIVE IDENTIFICATION OF OLDER PEOPLE WITH COMPLEX PROBLEMS

Older people at risk of a decline in functioning should be proactively identified in order to provide targeted integrated interventions. Functional decline will eventually lead to disability and dependency upon (informal) caregivers and, for most older people, this is an undesired outcome. Problems on four domains of health (functional, somatic, mental and social; Figure 1) are individually or in combination associated with an increased risk of functional decline. Older people with complex problems (i.e. ‘multiple problems in multiple domains of health that often interact’, Figure 1’), might be at even higher risk of functional decline. Therefore, these older persons will probably benefit most from interventions directed to the prevention or postponement of functional decline.

In a prospective study of the oldest old (aged 85 years at baseline) in the general population we used a multistate survival model to investigate the course of disability, functional decline and death, as well as their predictors, during 5 years of follow-up (Chapter 2). In contrast to a conventional Coxproportional hazard model (which allows only one transition: between an ‘alive’ state to a ‘death’ state), this survival model allows the movement of study participants between various states of disability. Results of this study show that disability is a dynamic process in the oldest old. Even though most transitions were directed to more functional impairment, some transitions were directed to improvement. Therefore, a multi-state model may be a better method to study the course of disability in a prospective survival study than a model that assumes that older people only decline in functional status.

In addition, we found that prior disability, chronic disease, depressive symptoms and cognitive impairment were individually associated with functional decline. Interestingly, these health problems are components of three of the four domains of complex problems: functional problems (disability), somatic problems (chronic disease) and
mental problems (depressive symptoms and cognitive impairment). Therefore, these results imply that those three domains are predictive for functional decline. In addition, evidence for an association between the social domain and functional decline merged from previous research, i.e. an analysis in the Leiden 85-plus Study showed that loneliness, a component of the social domain, is associated with mortality\(^2\). These results were confirmed in the Health and Retirement study, which also found an association between loneliness and functional decline\(^3\). Another study among the fittest community-dwelling older adults in Canada showed that the concept of ‘social vulnerability’, which is also a component of the social domain and includes social support, living situation, social engagement, socio-economic status etc., is associated with mortality\(^4\). The results of these three studies indicate that the social domain is associated with functional decline and mortality.

*Figure 1. Conceptual model of complex problems in older people.*
In the ISCOPE study, we showed that the combination of problems on the functional, somatic, mental and social domain was associated with disability, cognitive impairment, depressive symptoms, feelings of loneliness, poor health-related quality of life, and more GP contact time (Chapter 4). Results indicate not only a negative trend across the number of affected domains, but also a negative interactive effect for older persons with problems on all four domains. These results demonstrate that interaction of the four domains, with an accumulating effect on poor health, can be demonstrated when older persons have problems on four domains. Thus, older people with complex problems are at risk of poor health outcomes, including disability.

COMPARISON OF MEASURES TO IDENTIFY COMPLEX PROBLEMS

Health indicators for comparison of identification measures

Since older people with complex problems often have poor health, the indicators of poor health can be used to evaluate measures to identify complex problems (Table 1). In this thesis, we evaluated the accuracy and effectiveness of identification measures to identify poor health outcomes. Most of these health indicators also included components of the domains that determine complex problems. However, the health indicators used in this thesis (Table 1) were assessed using validated questionnaires, whereas the domains are usually assessed with short (and often not fully comprehensive) identification measures. We made this choice for practical reasons, because validated questionnaires for the domains are extensive and therefore not feasible to be used as an identification measure.

Each of the four health domains can be used individually or in combination as identification measures for complex problems. Each health domain is assumed to have a corresponding (poor) health indicator measured by an extensive validated questionnaire.

| Table 1. Poor health indicators applied in this thesis |
|-----------------------------|-----------------------------|
| Cross-sectional | Prospective |
| Change in |
| Disability | Disability |
| Life satisfaction/quality of life | Life satisfaction/quality of life |
| Depressive symptoms | Depressive symptoms |
| Loneliness | Loneliness |
| Poor cognitive function | Poor cognitive function |
| Use of GP care | Use of GP care |
| Chronic disease | Mortality |
| | Hospitalization |
In this thesis, the corresponding health indicators were disability and functional decline for the functional domain, chronic disease and mortality for the somatic domain, cognitive impairment for the mental domain, and loneliness for the social domain. Quality of life and healthcare use were health indicators that were considered to correspond with all these domains. The results of Chapters 4 and 5 confirm that four briefly assessed health domains are indeed associated with their corresponding health indicators (as an outcome).

The yield on health indicators of identification measures

In this thesis, we examined five measures to identify older people with complex problems: a profile of laboratory parameters, reduced handgrip- and quadriceps muscle strength, the Fried frailty phenotype criteria, the clinical intuition of the GP and, the ISCOPE screening questionnaire. The main results relating to these measures are briefly discussed below.

The profile of laboratory parameters (Chapter 3) was associated with 5-year mortality in the general population of older people, aged 85 years at baseline. The predictive accuracy of this profile was similar to that of two other known predictors (disability in instrumental activities of daily living [IADL] and slow gait speed). Based on these results, this profile might be an appropriate measure to identify complex problems; however, it is unknown whether this somatic laboratory profile is also predictive for health indicators other than mortality. Theoretically, this profile could be a good predictor for functional decline, because most of the components have been individually associated with poor functional status\textsuperscript{5, 6}, and to diseases related to poor functional status, such as stroke\textsuperscript{7} or functional decline\textsuperscript{8-11}.

Muscle strength is used often as a surrogate measure for sarcopenia\textsuperscript{12}, which is the degenerative loss of skeletal muscle. Sarcopenia is thought to be causally related to functional decline\textsuperscript{13, 14}. We found that both handgrip- and quadriceps muscle strength were independently associated with poor health indicators at baseline (Chapter 7). In contrast to hand grip strength, which was prospectively associated with disability in BADL (functional decline) and quality of life, quadriceps muscle strength had no prospective association with poor health indicators. These results indicate that both measurements of muscle strength could be used as a measure for complex problems. However, handgrip strength and quadriceps strength were only moderately correlated, which suggests that these two muscle parameters might represent different properties at old age. Since handgrip strength was the only measure that was associated with prospective poor health indicators, and this measurement is easier to obtain than quadriceps strength, handgrip strength would be recommended for general practice. As reduction in both
muscle parameters was associated with the poorest health indicators, this combination could be used to identify the most complex subpopulation of older people.

We compared the Fried frailty phenotype\textsuperscript{15} criteria and the clinical intuition of the GP with the ISCOPE screening questionnaire with regard to their yield on poor health indicators. The ISCOPE screening questionnaire is a new measure that was introduced in the context of the Integrated Systematic Care for Older PEople study (Chapter 8) and was developed based on the statement of the DCGP (Chapter 5). The questionnaire briefly assesses the four domains (4-7 items per domain) involved in complex problems (Figure 1). We found that the group of older people classified as having complex problems only moderately overlapped for these three measures (Chapter 6). The proportion of the population of older people classified as having complex problems also differed for each measure. Moreover, the three measures had a different yield on health indicators.

In addition, we found that the Fried frailty phenotype had a very strong association with disability and with the number of chronic diseases. In contrast, the ISCOPE screening questionnaire was associated with health indicators of all domains and had a strong association with loneliness compared to the other measures. Compared to the Fried frailty phenotype and the ISCOPE screening questionnaire, the GP’s clinical intuition had a strong association only with GP contact time.

In conclusion, since all five measures classified different groups of older people as having complex problems, and the association with health indicators also differed, one can conclude that these five measures may represent different operationalizations of the concept ‘complex problems’.

**Gold standard for complex problems?**

At the start of the research described in this thesis, no gold standard for complex problems was available. This led to difficulties when comparing the five measures, i.e. the individual measures could not be tested against a gold standard test to evaluate which was the best measure for complex problems. Moreover, because all measures had a different yield on health indicators and overlapped only moderately, none of the five measures is a candidate for a gold standard test.

The question then arises whether it is in fact possible to find a gold standard for complex problems. A gold standard test should be the most accurate test for a condition. According to this definition, the concept of ‘complex problems’ would be the condition to identify. A gold standard test should identify older people with complex problems as having complex problems, and older people without complex problems as having no complex problems, with low numbers of false-negative or false-positive results. (high
sensitivity and specificity). Since ‘complex problems’ is a very broad concept, finding a uniform gold standard will be very difficult.

**Suitable identification measure for general practice**

Despite the lack of a gold standard and the different operationalizations of the concept of complex problems, all of the studied measures identify older people with poor health outcomes. Therefore, these measures can be used to identify these older people in general practice. However, none of the measures can be recommended as the most suitable for general practice. When selecting a measure, a GP may take into account:

1. **The intended intervention**
   
   If a GP plans to target complex older people with loneliness, the ISCOPE screening questionnaire might be the measure of choice, since this measure was the most strongly associated with loneliness (*Chapter 6*). When a GP plans to identify a subpopulation of complex older people with disability, the Fried frailty phenotype (*Chapter 6*) or the measurement of muscle strength (*Chapter 7*) might be the best measure. If a GP aims to assess mortality risk, a profile of laboratory parameters could be used to exclude older people with poor life expectancy from, for example, extensive screening programs. Because the laboratory profile provides information beyond age alone, it can provide the GP with valuable information (*Chapter 3*).

2. **The workload involved with each measure**
   
   The clinical intuition of the GP is readily available for every GP and is not time consuming. In contrast, administration of the Fried frailty phenotype and the measurement of muscle strength is difficult, because these performance tests require training and are time consuming. The ISCOPE screening questionnaire can be sent by post and is therefore easy to apply in general practice. Although laboratory parameters are generally loaded directly in the GPs’ electronic patient record, measuring the laboratory parameters of all older people can be a costly process for a GP practice. Therefore, the clinical intuition of the GP, the ISCOPE screening questionnaire and the profile of laboratory parameters, could be applied in general practice.

3. **The intention for a systematic inventory of the older population**
   
   If GPs aim for a systematic inventory of the presence of complex problems in older patients in their practice, the ISCOPE screening questionnaire might be appropriate, because the total population of people aged 75 years and over can be easily approached via this postal questionnaire (on average 150 persons per practice). The Fried frailty phenotype and the measurement of muscle strength is not suitable for systematic inventories because of the above-mentioned workload. Therefore, the Fried frailty phenotype might be used as a second step when older persons are considered by the GP to have complex problems. The laboratory profile is also not
suitable for systematic inventories, because it is a very costly procedure to obtain blood samples from all older people in a general practice.

**Appropriateness of screening for complex problems**

In the ISCOPE study, we used systematic screening to identify complex problems. All people aged 75 years and over (apart from a small group of very ill people who were excluded by their GP) received a postal invitation to participate in the ISCOPE study. The response rate of the ISCOPE study was moderate but, presumably, the response rate will be higher when older persons are screened by their GP, because informed consent to join a comprehensive trial is then not necessary. Therefore, systematic screening for complex problems might be an appropriate method to select complex older persons for a targeted integrated intervention in general practice. However, such population screening programs have to fulfil the 10 criteria of screening programs for disease, as published by Wilson and Jungner:

1. The first criterion is that **the condition sought, should be an important health problem**. This criterion applies to complex problems, which has a high prevalence and has important consequences for the health of older people. Complex problems are associated with disability, depressive symptoms, cognitive function, feelings of loneliness and health-related quality of life (Chapter 4 and Chapter 6). Moreover, complex problems also have consequences for healthcare use, since older people with problems on four domains have more contact with their GP at baseline, but also during 12-months of follow-up; this implies that complex problems are also a predictor for future GP care use. Therefore, the first Wilson and Jungner criterion can be fulfilled.

2. The second criterion is that **there should be an accepted treatment for patients with recognized disease**. Although studies have demonstrated a small but significant effect of integrated care for older people, in this thesis, an integrated care-action plan did not have an effect on older people with complex problems in general practice (Chapter 8). Therefore, the second criterion of Wilson and Jungner is not yet fulfilled.

3. **The availability of facilities for diagnosis and treatment** is the third criterion. Although ‘diagnosing’ complex problems could relatively easily be facilitated with one of the above-mentioned measures (with the postal ISCOPE screening questionnaire, the population can easily be reached), there are no facilities for treatment because an effective treatment is not available (criterion 2). Therefore, the third criterion cannot be fulfilled. Further research is needed to find an effective treatment and, when this treatment is found, facilities can be established.

4. **There should be a recognizable latent state or an early symptomatic state of the disease**. Since older people with complex problems are at risk for functional decline
and the aim of screening for complex problems would be to postpone functional
decline, complex problems can be considered to be an early symptomatic state. This
criterion can therefore be fulfilled.

5. The fifth criterion is a **suitable test or examination**. This thesis is devoted to a search for a suitable test. This search yielded inconclusive results, since none of the five studied measures could be recommended as the most suitable test. Therefore, the fifth criterion cannot be fulfilled.

6. The sixth criterion is an **acceptable test**. Although we did not actually ask the older participants, it can be assumed that screening with a postal questionnaire would be acceptable, whereas screening with laboratory tests or performance tests might entail some resistance. Therefore, with the ISCOPE screening questionnaire we have an acceptable test which fulfils the sixth criterion.

7. To fulfil the seventh criterion, the **natural history of the condition, including development from latent to declared disease, should be adequately understood**. This is not the case for complex problems. Since ‘complex problems’ is a concept with various operationalizations it needs further unravelling. Moreover, it is unknown how older people become ‘complex’ and whether or not having complex problems is a dynamic process, with transitions in and out of complex problems. Therefore this criterion has not yet been met.

8. There should be an agreed policy on whom to treat as patients. Since the five studied measures all classify different groups of older people as complex, it would be very difficult to fulfil this criterion.

9. The ninth criterion includes the **costs of screening, which should be economically balanced in relation to possible expenditure on medical care as a whole**. The ISCOPE study, which included screening for complex problems and subsequently an integrated care-action plan for older people with complex problems, was not cost-effective. Therefore, this ninth criterion is not fulfilled.

10. The tenth criterion is that **screening should be a continuing process and not a one and for all project**. When a screening program for complex problems is started, it is intended as a continuing process. However, it is unknown what the frequency of screening should be. Further research needs to establish an appropriate frequency for this screening. Therefore, this criterion is not yet fulfilled.

In conclusion, population screening for complex problems fulfils three of the Wilson and Jungner criteria (criterion 1, 3 and 6). It is uncertain whether two criteria are or can be fulfilled (criterion 4 and 10), and five criteria are not (yet) fulfilled (criterion 2, 5, 7, 8 and 9). Therefore, systematic population screening for complex problems is not yet appropriate. Most of the criteria need more research, i.e. to find an (cost-) effective treatment for complex problems (criterion 2, 3 and 9), on the natural history of complex problems.
General discussion

(criterion 7), and to establish an adequate frequency of screening (criterion 10). If these criteria can be substantiated, population screening will deserve consideration again.

Case finding

Since systematic population screening for complex problems is not appropriate, another method is needed to identify older people with complex problems in general practice. Case finding involves screening a smaller group of people based on the presence of known risk factors. This might be an appropriate method to identify older people with complex problems. The results of this thesis indicate several possibilities to apply this method:

1. Alertness for non-responders
   In the ISCOPE study, older people who did not respond were more often appraised to be vulnerable by their GP, and were often visited at home by their GP. These results might imply that older people who do not respond are in fact more complex than older people who respond. Possibly, older people who tend not to respond to preventive treatment in general practice (e.g. influenza vaccination) might be more interesting candidates for interventions directed to complex problems, because the above-mentioned results indicate that they might be more complex than older people who do respond. GPs could use this information to increase their alertness for older people who tend to be non-responders.

2. Use of GP’s clinical intuition
   The results of Chapter 6 show that older people with poor health indicators could be identified by the clinical intuition of the GP. Compared to the ISCOPE screening questionnaire and the Fried frailty phenotype, the intuition of the GP had a strong association with GP contact time, which could indicate that the GP’s intuition is not only a measure for complex problems in itself, but also for care complexity, which is related to difficulties in the care delivery process (Chapter 6). GPs could use this intuition to find older people with care complexity in their practice. If their intuition assesses an older person to be complex, this older person will need more GP care in the future. GPs could use this information to identify older persons for interventions to lower the care needs of these older persons.

3. Laboratory monitoring in older people
   Most older people are regularly monitored with laboratory parameters because they suffer from chronic diseases, including diabetes mellitus, hypertension and cardiovascular diseases. This regular monitoring could be extended with additional parameters, resulting in a complete laboratory profile on a regular basis. The results of the laboratory monitoring could be used to identify cases of older persons that are at high risk of mortality.
A disadvantage of case finding is that it is impossible to identify all older persons with complex problems, because only individuals with known risk factors (e.g. non-responders, GPs clinical intuition, older people who are regularly monitored with laboratory parameters) are identified. People without known risk factors will be missed by these methods. However, if these three methods are combined, they may allow to obtain a reasonably complete overview of the older persons with complex problems within a GP practice.

**EFFECTIVENESS OF PROACTIVE INTEGRATED CARE FOR OLDER PEOPLE IN GENERAL PRACTICE**

Proactive integrated care was suggested as a solution for uncoordinated care in older people with complex problems. In the ISCOPE study, a proactive integrated care plan had no direct effect on functional decline or quality of life for older people with complex problems. There are two possible explanations for this lack of effect: 1) there is indeed no direct effect of proactive integrated care, or 2) there is an effect (direct or not), but we have failed to demonstrate this effect within the ISCOPE study.

There is a possibility that proactive integrated care might have no direct effect on older persons in itself, because it is theoretically simply not a suitable way to deal with complex problems. However, because some studies demonstrated small but significant effects, this explanation seems implausible. Moreover, integrated care has become standard for some diseases and in some general practices. Our study shows that GPs preferred proactive integrated care, and older people were slightly more satisfied in the intervention group than in the usual care group. Therefore, we may assume that there is an effect of integrated care, but that we could not demonstrate this effect. Several methodological issues might need to be addressed before we can draw definite conclusions about these items.

**Methodological considerations for future studies**

**Target group**

In the ISCOPE study, the target group for the integrated care plan were older people who screened positive for complex problems. In a previous review, it was suggested that interventions directed to the prevention of disability may be more effective in low-risk persons. Persons that were selected for our intervention might have been too complex. This was confirmed by the results of focus group interviews of eight GPs in the intervention group. They indicated that the older people selected for the intervention...
were not always the most appropriate people. Some older people seemed to use the screening to get more attention, or had problems that had been extensively dealt with before. Others indicated problems that could not be altered.

An intervention directed at persons that might have problems on only one or two domains could be more effective in preventing these older persons to develop problems on all of the domains. Such an intervention might prevent further deterioration into complex problems.

**Avoid behavioural change of care professionals in usual care group**

The GPs in the intervention group were compared to a group of GPs that was assumed to provide usual care. However, before randomization, most participating GPs were enthusiastic about integrated care and hoped to be randomized in the intervention group. It is known from previous research that (undesired) behavioural change of participating care professionals is often present in a usual care control group. Hence, it is questionable whether GPs in the control group did or did not change their behaviour.

Behavioural change among the GPs in the control group is all the more likely since a statement of the Dutch college of General Practitioners (DCGP) was published before the start of the ISCOPE study and recommended integrated care for older people (in 2007). This statement was available for all GPs. During the study, much attention in the Netherlands was focused on optimization of medical care for older persons. In 2009, the Dutch Royal Medical Association published a policy report on care for older people. Moreover, the theme of the yearly conference of the DCGP in 2009 was ‘Care for older people in general practice’. This conference encouraged GPs to approach their older patients proactively and provide integrated care. All GPs could attend this conference, including GPs from the usual care group. This societal attention for older people with complex problems might have stimulated a behavioural change in GPs who were assumed to provide usual care. This behavioural change might have diluted the effect of an integrated care action plan for older people with complex problems in the intervention group. Future research on integrated care interventions should aim to prevent this ‘contamination’ of the usual care group, but this is also very difficult. A study with a cluster randomized stepped-wedge design might help to avoid this contamination. In such a design every cluster eventually receives the intervention. This may prevent practices from starting the intervention during the time spent in the control phase.

**Increase sample size**

Primary care in the Netherlands has a very high standard. This might have made it very difficult to demonstrate an effect of an integrated care intervention, since there is little room for improvement. A larger sample size is probably needed to demonstrate a (probably small) effect of integrated care. In the context of the National Program of Elderly
Care (NPEC), a governmental program aiming to improve the quality of care for older people, ten studies of integrated care in general practice were set up. All these studies used the same minimal dataset, which included measures on functional status and quality of life, as an outcome. Therefore the results of these studies could be combined in an individual patient data (IPD) meta-analysis to see whether there is an overall effect of integrated care in general practice on functional outcomes and quality of life in older people.

**Development of evaluation tools for integrated care interventions**

Maintaining their functional status and quality of life is important to older people. Therefore, the aim of the ISCOPE study was to prevent functional decline and/or decrease in quality of life. However, two recent reviews showed that complex interventions to prevent functional decline had no (or no clinically relevant) effect. Therefore, to evaluate such complex organizational interventions measuring functional status or quality of life on the patient level may not be appropriate.

Goal attainment scaling is a way to evaluate whether patient goals are achieved and is responsive to clinical changes. A characteristic of an integrated care-action plan is that care goals are defined with the patient. Evaluating if these goals are achieved could be a better method to evaluate such an intervention. Therefore, goal attainment scaling could be a useful evaluation tool for further research on integrated interventions in primary care.

**Funding for integrated care**

GPs in the intervention group did not receive financial support to implement proactive integrated care in their practices. There was no funding for interdisciplinary consultation meetings; however, these are essential to collaborate with a multidisciplinary team. For the success of future integrated care interventions, funding for these meetings should be available. However, extra funding will not lead to a success of integrated care by itself, but should be combined with the suggestions above.

**Considerations for future interventions in older people**

The lack of effectiveness of the ISCOPE study might also be attributed to our intervention, for the following reasons.

**Unmet care needs**

In the ISCOPE study, unmet needs were not specifically considered in the integrated care-action plan. Unmet needs are defined as a (health) problem of an older person, that may be hidden or not immediately obvious to their physician. Moreover, this health problem has not been adequately addressed either by older persons themselves, their
family and friends, or their caregivers\textsuperscript{29}. In a previous study, vision, hearing, mobility, falls, incontinence, depression and anxiety were identified as covering 69\% of the most common unmet needs in older people\textsuperscript{29}. Some of these problems can probably be dealt with using a relatively easy intervention. Therefore, it is important to consider unmet needs when designing an integrated care intervention. Addressing unmet needs by applying relatively small interventions might substantially improve the quality of life and/or functional status of older people. Therefore, when designing future interventions for older people with complex problems, unmet care needs should be considered and identified. The ISCOPE screening questionnaire, used to identify older people with complex problems in the ISCOPE study, included an open question that assesses which problems most hinder an older person. Although the results of this question were not taken into account in this thesis, the responses to this question might reflect the unmet needs of older people. The answers to this question may be used to identify unmet needs and to act upon these unmet needs.

An integrated intervention on population level
For optimal integrated care for older people, collaboration with other caregivers is essential. For individual GPs, it is difficult to set up a network of all caregivers and healthcare workers involved in the care for older people. Therefore, plans on an aggregation level higher than on the individual general practice level are needed. For example, within a village or city district all key players involved with elderly care could constitute a work group with representatives from all these key players. This workgroup connects the key players and could facilitate collaboration within a city district or village. This may facilitate integrated care for older people based on better collaboration between the healthcare professionals involved with an older person.

Collaboration with elderly care physician and GP with expertise in geriatrics
GPs might not have optimal competencies to carry out an integrated care intervention. In the Netherlands, one of the strengths of GPs is that they have generally known their patients for a relatively long time. This means they see the patient in the context of the longitudinal (medical) history, which can be considered as a vertical view on the problems and care for older patients. In the Netherlands, elderly care physicians receive a three-year training in the provision of care to very complex older people in nursing homes in collaboration with other caregivers, and are involved with these patients on a daily basis. Therefore, elderly care physicians have a broader (so-called horizontal) view on care for complex older people than GPs. Since recent years, elderly care physicians are increasingly involved with complex older people in primary care. These elderly care physicians advise GPs on integrated care interventions. Many initiatives to further
establish these collaborations are being developed to the satisfaction of GPs, elderly care physicians and older patients.

In addition, since 2007, an increasing number of GPs have acquired expertise in geriatrics by following a 2-year postgraduate education program (core training) in geriatrics. These GPs have learned to adapt their practices towards the needs of an aging society and can also help other GPs to set-up integrated care in their practices.

Whether collaboration with an elderly care physician or a GP with expertise in geriatrics resulted in positive effects on functional status and quality of life in the ISCOPE study, remains to be examined. However, collaboration with physicians that have expertise in geriatrics could help the GP to better organize elderly care in his practice; this is needed by most GPs because of the ageing population.

FUTURE

Recommendations for further research

Recommendations for research on identification of complex problems in older people

• When investigating measures to identify older persons at risk for functional decline in a prospective study, the fact that disability is a dynamic process should be taken into account. Therefore, multistate modelling should be used.
• The laboratory profile is a good measure to identify complex older persons at risk for mortality, but the predictive validity for functional decline is still unknown.
• Because of the various operationalizations of complex problems, this concept needs further unravelling, including the natural history and the interactive effect of the four domains determining complexity.
• Because systematic screening of the older population on complex problems does not fulfil the criteria of Wilson and Jungner, further research could investigate case-finding as a method to identify older persons with complex problems.

Recommendations for research on proactive integrated care

For future research on integrated care interventions in general practice, we need to consider the target group for integrated interventions. Interventions could be targeted at persons that are not complex, but might be at risk to become complex. Therefore, measures should be developed to identify this group, or existing measures adjusted to select this target group. In addition, an IPD meta-analysis of all studies in the NPEC will indicate if there is an effect of proactive integrated care in general practice. Moreover,
goal attainment scaling should be investigated as an evaluation tool for integrated interventions in general practice.

**Implications for general practice**

We have introduced five methods to identify a group of older persons with complex problems at risk of poor health. Not all of these measures covered all the domains that were associated with complex problems, but it became clear that complex older persons can be identified. GPs could use all five measures in their practices, but which measure to use should depend on the intended intervention, the workload involved with each measure, and the intention to systematically map their older population.

Screening for complex problems followed by an integrated care plan for older people who screened positive for complex problems cannot be recommended, because this integrated care model had no beneficial effect on functioning and quality of life, or on healthcare costs. Nevertheless, integrated care seems to have gained its own momentum. Several general practices in the Netherlands have implemented integrated care for older people. Although an integrated care plan has not yet been proven to improve patient outcomes in general practice, it might be a valuable tool for general practice when implementing integrated care.

**CONCLUSION**

The main conclusions of this thesis are that; 1) the item ‘complex problems’ has various operationalizations, all of which can be identified by relatively simple measures, and that 2) direct benefit from proactive integrated care for older people with complex problems could not be demonstrated, which might be attributed to the study design and/or to the intervention itself. Therefore, more studies are required and additional interventions need to be developed in order to improve the care for older persons in general practice.
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