

Reforming Long-term Care in Germany: Preliminary findings from a social experiment with matching transfers

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Abstract

Given projections regarding the number of benefit recipients in the long-term care social insurance (LTC-SI) in Germany, cost pressures are expected to rise continuously. Thus, reforming the LTC-SI appears to be the only possible route in order to ensure current care levels for future generations of the frail elderly without strongly increasing the social contribution rates for the LTC-SI. Since, from the LTC-SI perspective, nursing home care is much more expensive than home care, inducing a higher share of benefit recipients to stay at home becomes a natural starting point in order to reduce cost pressures. Thus, one main objective of the reform of the LTC-SI is a higher degree of flexibility in the LTC-transfer system that allows for more stable home care arrangements. One way to introduce more flexibility to the current system is to allow for a matching transfer in addition to the currently available in-kind transfers and lump-sum transfers. A matching transfer allows for an extended spectrum of care services and also provides a supportive case management. The paper looks at the matching transfer from a theoretical perspective using a simple household bargaining approach. In an empirical part, the paper presents the key parameters of a social experiment that introduces a matching transfer in seven sites in Germany and also discusses preliminary results.

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1. Introduction

In the mid-nineties, Germany gradually introduced a long-term care social insurance (LTC-SI) to reduce public assistance dependency for nursing home residents. Since 1999 expenditures have exceeded receipts and in 2003 a record deficit summed up to 690 m €. According to estimates by German Federal Ministry of Health and Social Security, the LTC insurance's cash reserve of approximately 3 bn € will be exhausted in 2007 so that initial surpluses are expected to turn to overall deficits by 2007.

One important determinant of expenditure projections is the proportion of benefit recipients in nursing homes. From the LTC-SI perspective, nursing home care is much more expensive than home care. Due to demographic change and unstable social networks in families, the proportion of benefit recipients is expected to rise continuously. According to such status quo projections, these severe cost pressures for the LTC-SI will finally lead to higher social contribution rates (see e.g. Rothgang 2003). A projection of the *Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung* (2004), based on age-specific care probabilities and the population forecast by the Federal Statistical Office in Germany, reports an increase in the number of frail elderly from 1.9 m (2003) to 2.39 m (2050) in a status quo scenario. Correspondingly, the deficit-adjusted social contribution rate would have to rise from today's 1.75% to 2.81%. A worst-case scenario draws a projection leading to more than 4 m benefit recipients and a deficit-adjusted contribution rate of more than 10%.

Against this background, inducing a higher share of benefit recipients to stay at home (which is also their favourite option) becomes an important objective of any reform of the LTC-SI. One natural starting point is a higher flexibility in the LTC-transfer system that allows for more stable LTC-arrangements in home care. Until now, benefit recipients choose among three types of transfers: an in-kind transfer that is restricted to a small number of legally defined LTC services, a less generous lump-sum transfer and a combination of both kinds of transfers. Due to the restrictive set of LTC services that are available as in-kind transfer, a matching transfer that also pays for soft care services has been considered an attractive fourth option. Soft care refers to services that are not paid by the current LTC-SI in-kind transfer such as home delivery, laundry and reading services and services provided by friends, neighbours or other legal carers. The matching transfer differs from the lump-sum type transfer in that it may neither be used to pay family members for their informal care nor may it be used for any non-care related consumption. In order to evaluate the costs and benefits of introducing a matching transfer to the already existing LTC-SI transfer system, matching transfers are being tested by social experiments in various sites in East and West Germany

between 2004 and 2008. This model project¹ is being funded by the employee association of the LTC insurers, the *Verband der deutschen Angestelltenkassen* (VdAK). The project is being conducted by *Evangelische Fachhochschule Freiburg* (EFH Freiburg). The research accompanying the project is being done conjointly by care scholars, sociologists, lawyers and economists in order to embrace the complexity of the different aspects of the project. The *Kontaktstelle* of EFH Freiburg examines the legal dimensions and care aspects, whereas sociological aspects are being analysed by the Freiburg Institute for Applied Social Sciences (FIFAS). The Mannheim Centre for European Economic Research (ZEW Mannheim) focuses on economic aspects and the cost benefit analysis of introducing matching transfers to the currently existing transfer system. Matching transfers will be introduced at seven sites in eastern and western Germany. It aims at surveying 800 individuals in the program group and comparing them to approximately 800 individuals in the control group between October 2004 and March 2008.

The structure of the paper is the following. In section two, we present a bargaining approach in the spirit of Pezzin/Schone (section 2.1) and introduce “soft care” in addition to formal and informal care. We deduct various hypotheses with respect to lump-sum and in-kind transfers as well as the experimentally tested matching transfer that allows for soft care services. In particular, we derive substantiated microeconomic hypotheses about the rationality of care arrangements including lump-sum transfers (section 2.2), in-kind transfers (section 2.3), matching transfers (section 2.4).

In the empirical part of the paper, section 3 presents a brief overview of the model project and discusses some methodological challenges that have to be resolved when evaluating a matching transfer. Section 4 presents preliminary findings, especially concerning the statistical comparability between program and control group which is a major requirement for generating consistent and valid results regarding the effect of matching transfers on the stability of home care arrangements and other dimensions. The paper then continues by raising some critical issues regarding the implementation of the model project. If the number of participants continues to rise after this first implementation period, the paper concludes in section 5 that the design of the model project ensures that causal conclusions may be drawn.

¹ The model project is based legally on § 8(3) SGB XI which assigns the LTC insurers to conduct field projects regarding matching transfers.

2. Theoretical Analysis

2.1 The Model

We consider a family consisting of two members, one adult daughter and one elderly parent (indexed by d and p , respectively)². The parent needs long-term care, but her cognitive status allows her to make decisions unilaterally and to act as a utility maximising player. The parent's utility depends on her private consumption, C^p , and her physical health or well-being, G . Preferences are represented by:

$$(1) \quad U^p(C^p) + V^p(G).$$

The daughter, on the other hand, is assumed to be altruistic in the sense that a component of the parent's utility function, namely the health status G , enters her own utility function. Her preferences are given by

$$(2) \quad U^d(C^d) + V^d(G),$$

where C^d denotes d 's private consumption. Utilities U^i and V^i for $i = p, d$ in (1) and (2) are increasing and strictly concave.

In accordance with e.g. Konrad and Lommerud (1995), and Pezzin and Schone (2000) we model the parent's health G as a family public good. The production of G requires the receipt of some form of care, and we distinguish between three types of care (health services): formal care F purchased in the market, soft care Q also purchased in the market, and informal care I provided in-kind by the daughter. If the parent needs help for basic personal activities such as eating and bathing, she will typically demand formal care F by hiring a professional care provider. If, however, the parent has limitations in other, less personal activities, such as shopping, reading, taking a walk, or doing the laundry, she will at first ask her daughter and/or friends and neighbours for help. In Germany, the long-term care social insurance pays for formal care, but not for these soft care services. The experimentally tested matching transfer, however, can be used for soft care services provided by friends, neighbours or other legal carers (but not by family members). Informal care I provided by the daughter takes on all forms of health services, the parent does not pay for I . To simplify the interpretation of the model it is helpful to regard the health services F , Q and I as time inputs as put forward by Pezzin, Pollak and Schone (2004), for instance.

Let the health technology be

$$(3) \quad G = A \cdot H(F, Q, I),$$

² The model is described in full detail in Michaelis (2005).

where A is a parameter denoting the efficiency of the care arrangement. As described above, an important part of the social experiment is the implementation of a so-called case manager. Like a broker he reduces the transactions costs of the care arrangement by collecting and providing information on the demand for and supply of care services. In other words, the case manager serves as an instrument to improve the efficiency of the care arrangement. In our modelling approach this corresponds to an increase in the efficiency parameter A . The analogy to the modelling of Hicks-neutral technical progress in a neoclassical growth context is obvious³.

The parent p chooses formal care F and soft care Q to maximise her utility function (1) subject to the budget constraint

$$(4) \quad Y^p + T^{g,p} = C^p + P^F F + P^Q Q,$$

where Y^p is the parent's exogenous income, $T^{g,p}$ is a cash transfer paid to the parent, P^F is the price of a time unit of formal care, and P^Q is the price of a time unit of soft care. The price of C^p is normalised to one.

The daughter d allocates her time available M between informal care I and the supply of labour in the market, where she receives a wage W per unit of time. The daughter decides on the amount of informal I to maximise her utility function (2) subject to the budget constraint

$$(5) \quad (M - I)W + T^{g,d} = C^d.$$

Labour income and the cash transfer $T^{g,d}$ is spent for consumption.

We consider a fully non-cooperative game. The parent decides on the optimal amount of F and Q , taking as given the daughter's choice of I . Analogously, the daughter decides on the optimal amount of I , taking as given p 's choice of F and Q . These decisions lead to a set of reaction functions, the intersection of these reaction functions determines the Nash equilibrium. At the equilibrium, the choices are such that they are mutually optimal responses. As pointed out by Lommerud and Konrad (1995), the Nash conjecture implies an underprovision of the family public good G . Since the parent's well-being is part of both (1) and (2), the production of G generates a positive spill-over which is not internalised by the players. There are two ways to achieve efficiency in family bargaining. Either the family is assumed to behave as if it were maximising a family utility function (see Becker, 1991, and Hoerger et al., 1996), or one assumes a Nash-bargain over F , Q and I . The assumption of a family utility function contradicts with empirical evidence (see e.g. Altonji et al., 1992, and

³ A detailed theoretical analysis of case manager's activities can be found in Michaelis (2005). An empirical analysis of case managers is not available at this preliminary stage of the model project.

Pezzin and Schone, 1997). The modelling of a Nash bargain, however, may serve as a fruitful route for further research. The most forceful argument for a non-cooperative family, at least from our point of view, comes from the cooperative bargaining models itself. In these models the threat point reflects utility during conflict, and conflict is not properly described by living as single but by the level of F , Q and I which is set by each party unilaterally taking as given the other's strategy. In short, the outcome of the non-cooperative family model is the threat point of the cooperative bargaining model.

The first-order conditions for a utility maximum read:

$$(6) \quad F: \quad P^F U'^p = V'^p \cdot AH_F$$

$$(7) \quad Q: \quad P^Q U'^p = V'^p \cdot AH_Q$$

$$(8) \quad I: \quad W \cdot U'^d = V'^d \cdot AH_I,$$

where a prime denotes the first derivative of a utility function, e.g. $U'^p \equiv \frac{\partial U^p}{\partial C^p}$, and a

subscript denotes the first derivative of the health technology, e.g. $H_F \equiv \frac{\partial H}{\partial F}$. According to

(6) and (7) the parent demands for formal care F and soft care Q up to the point where the marginal utility of a higher well-being is equal to the opportunity costs in form of forgone consumption. Similarly, Eq. (8) states that the daughter supplies informal care I up to the point where the marginal utility of p 's higher well-being is equal to the opportunity costs in form of foregone wage income (consumption).

2.2 Cash Transfer

Equations (3) to (8) form a model of six equations with six endogenous variables: F, Q, I, G, C^p, C^d . In this section we show how these variables depend on cash transfers. We distinguish between a cash transfer to the parent and a cash transfer to the daughter. In the former case the parent is entitled to the transfer, this mirrors the current legal framework in Germany. The latter case, in turn, captures two scenarios, firstly, the daughter is entitled to the cash transfer, and secondly, the parent passes the transfer on to the daughter in order to “compensate” the daughter for the provision of informal care.

To carry out the policy analysis we need the total differential of equations (3) to (8). By assuming that the health technology $H(F, Q, I)$ is additive separable in its arguments, we get

$$(9) \quad P^F U^{''p} dC^p = AH_F V^{''p} dG + AV'^p H_{FF} dF + V'^p H_F dA$$

$$(10) \quad P^Q U^{''p} dC^p = AH_Q V^{''p} dG + AV'^p H_{QQ} dQ + V'^p H_Q dA$$

$$(11) \quad WU^{''d} dC^d = AH_I V^{''d} dG + AV'^d H_{II} dI + V'^d H_Q dA$$

$$(12) \quad dG = AH_F dF + AH_Q dQ + AH_I dI + HdA$$

$$(13) \quad dT^{g,p} = dC^p + P^F dF + P^Q dQ$$

$$(14) \quad dT^{g,d} - WdI = dC^d .$$

From this we can deduce

Proposition 1: a) A higher cash transfer to the parent, $T^{g,p}$, leads to an increase in F , Q and C^p . The daughter reduces her supply of informal care I and increases consumption C^d .

b) A higher cash transfer to the daughter, $T^{g,d}$, induces the daughter to supply more informal care I and to consume more. The parent reduces her demand for formal care F and soft care Q , consumption C^p goes up.

Proof: see Appendix A

The cash transfer to the parent is equivalent to an increase in p 's income. Since there is no choice restriction and since all goods are assumed to be normal goods with positively sloped Engel curves, the parent buys more of both health services F and Q and consumption goods C^p . The increase in p 's health G creates a positive externality, the daughter's utility increases too. Since the marginal utility of health is assumed to decline in G , the marginal utility of informal care is now lower than the opportunity costs in form of foregone consumption. The daughter reallocates her time budget in favour of market work, she supplies less I but consumes more. Note, however, that the crowding out of informal care I is only partial, i.e. the decline in I does not compensate the increase in F and Q , so that p 's well-being G always increases.

A cash transfer to the daughter has similar effects, but with "reversed" signs. The transfer stimulates d to consume more and to shift the time allocation in favour of informal care in order to produce a higher G . In response to the positive externality, the parent reallocates her budget by reducing the demand for health services and increasing the demand for consumption goods.

Given these results the question arises whether the cash transfer to the parent or the cash transfer to the daughter is more helpful for p 's well-being. Unfortunately, this question cannot

be answered in a satisfying way, it depends on all parameters of the model. However, the long-term care social insurer would surely prefer a cash transfer to the daughter. From their point of view, the higher level of informal care is equivalent to a stabilisation of the home care arrangement leading to a delayed entry into nursing homes and thus to reduced costs.

2.3 In-kind Transfers

In Germany, the long-term social insurers provide in-kind transfers, i.e. transfers that can be used only for purchases of health services defined in the German legislation (§36 SGB XI). Additionally, the supplier of these services must be a professional carer. Note, however, that for a given degree of disability, the in-kind transfer is about twice as large as the cash transfer.

Turning to our economic model, the choice restriction is nothing else than an inequality constraint. The expenditure for formal care must not be lower than the in-kind transfer T^S : $P^F F \geq T^S$. How do the recipient (parent) and the daughter respond to the implementation of an in-kind transfer programme? As it is well-known, the answer depends on the initial equilibrium. If in a world without transfers the optimal expenditures for formal care exceed T^S , such a transfer will have only an income effect. The impact on F , Q and I is the same as if a cash transfer programme (of equal size) were implemented.

Under the more plausible assumption of a binding constraint,

$$(15) \quad P^F F = T^S,$$

i.e. optimal expenditures for formal care are less than T^S , an in-kind transfer programme leads to an “over-consumption” of F . The first-order condition for formal care (eq. (6)) is no longer valid, the change of F now follows from (15): $dF = (1/P^F)dT^S$. By observing (15) p 's budget constraint (4) simplifies to

$$(16) \quad Y^P = C^P + P^Q Q.$$

The parent uses her income for purchases of consumption goods and soft care services. The optimal amount of C^P and Q is determined by the first-order condition (7) which does not change since p still optimises over Q . To summarise, the in-kind transfer system is described by the constraints (5), (15) and (16), the technology (3), and the first-order conditions (7) and (8).

Proposition 2: A higher in-kind transfer to the parent T^S increases formal care F but reduces soft care Q and informal care I . Consumption C^P as well as consumption C^d increases.

Proof: see Appendix B and text.

Because of the choice constraint, a higher transfer has to be used for higher formal care services. The parent buys more F than it is optimal, thus health G is “too high”. The optimal response is a decline in the purchases of soft care Q which is equivalent to a shift towards higher consumption C^P . The net effect on health G (higher F but lower Q) is positive, so that the daughter profits from a positive externality. Her optimal response turns out to be a shift towards market work, she consumes more and reduces her supply of informal care.

2.4 Matching Transfer

The matching transfer has elements of both cash and in-kind transfer. It is a cash transfer, but unlike the cash transfer discussed in section 2.2 the money can not be spent for consumption goods. The matching transfer can be used only for health services, but unlike the in-kind transfer of section 2.3 the matching transfer pays not only for legally defined services (formal care) but also for soft care services by friends, neighbours or other legal carers. Note, however, that a matching transfer can be used only for market activities.

In terms of our model, the choice restriction of the matching transfer system is given by $P^F F + P^Q Q \geq T^B$. If in a world without transfers the optimal expenditures for formal and soft care exceed the matching transfer T^B , such a transfer will have the same effects as a cash transfer of equal size. In this case, the constraint does not bind, the constraint is neutral.

In the following we assume a binding constraint,

$$(17) \quad P^F F + P^Q Q = T^B,$$

that is, expenditures for health services are higher than in an unconstrained optimum. Inserting (17) into the parent’s budget constraint (4) yields

$$(18) \quad Y^P = C^P,$$

p ’s consumption is pinned down by her income.

Given the matching transfer and thus the budget for health services the parent can choose the optimal amount of F and Q in a “textbook” manner. The optimal allocation of p ’s matching transfer T^B is given at the point where the ratio of marginal utility to price will be the same for F and Q :

$$(19) \quad \frac{V'^p AH_F}{P^F} = \frac{V'^p AH_Q}{P^Q}.$$

Equations (17) to (19), the technology function (3), the budget constraint of the daughter (5) and the first-order condition (8) for informal care I form a model, which can be used to analyse the impact of a matching transfer.

Proposition 3: A higher matching transfer T^B to the parent enhances the demand for formal care F and soft care Q , the daughter reduces her supply of informal care I .

Proof: see text

A higher matching transfer must be used for higher purchases of health services. Since formal care and soft care are assumed to be normal goods, the new optimal bundle contains both more F and more Q . The parent's well-being G increases generating a positive externality for the daughter. And as it is familiar by now, the daughter reallocates her time budget in favour of market work, she reduces her supply of informal care I .

2.5 Hypotheses

Our conceptual framework leads to (at least) four testable hypotheses:

1. The demand for formal care and soft care and the supply of informal care by family members and/or friends are substitutes. We argue that health of the elderly is a family public good. Due to externalities the effect of additional formal and soft care is expected to be a drop in informal care vice versa. Health services provided by professional carers crowd out private effort on the part of the elderly's relatives/friends.
2. If it is not the disabled elderly person but her grown kid who decides on the use of a cash transfer (disabled person passes the transfer to the kid), informal care is expected to increase. This is equivalent to a stabilisation of the home care arrangement, the entrance into a nursing home is expected to be delayed.
3. In the social experiment the matching transfer is twice as much as the cash transfer but identical with the in-kind transfer. (Almost) all recipients of the in-kind transfer will switch to the matching transfer since no price has to be paid for the lessening of the choice restriction. The enrichment of the opportunity set implies an increase in the demand for soft care and a fall in the demand for formal care.

3. A social experiment with matching transfers

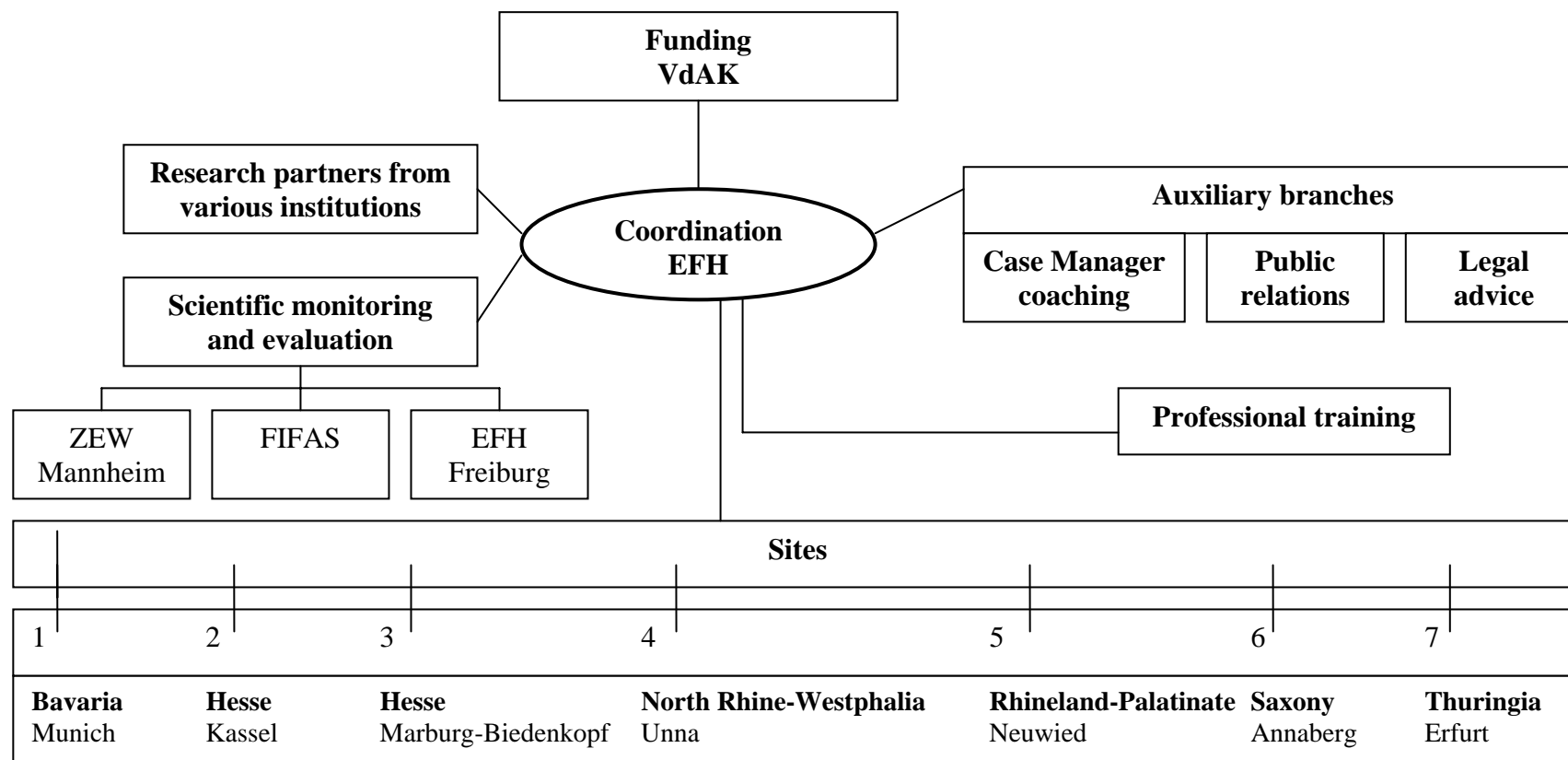
3.1 Overview and objectives of the project

In order to evaluate the effects of introducing a matching transfer to the already existing LTC-SI transfer system in light of the above hypotheses, matching transfers are being tested by social experiments in various sites in East and West Germany between 2004 and 2008. This model project is being funded by the employee association of the LTC insurers, the *Verband der deutschen Angestelltenkassen* (VdAK). All important players involved in the coordination or research of the model project can be seen in figure 1.

One major objective of the project stems from the necessity of reforming the current LTC-SI system in order to reduce constantly rising cost pressures. As discussed previously, one natural starting point for reducing cost pressures is to prolong any time frail elderly remain in home care since nursing home care results in higher expenditures for the LTC-SI. Thus, stabilizing home care arrangements is high on the agenda. According to our theoretical model, the introduction of matching transfers may be expected to stabilize home care arrangements by encouraging additional informal care by family members and other informal carers (hypothesis 2). With stable care arrangements, the frail elderly are more likely to stay in home care instead of having to be nursed in a foster home. Thus, while introducing matching transfers may be considered more costly than currently available transfers types⁴ when viewed from a static perspective, matching transfers may well be cost efficient if dynamic savings are taken into account. Moreover, frail elderly typically prefer home care and consider a prolonged period in their familiar surrounding as an improvement of their quality of life (see Schupp and Künemund, 2004). Thus, the main objective of the forthcoming analysis is to examine whether matching transfers are cost-efficient while improving the quality of life of the recipients at the same time.

This analysis is of course closely linked to an analysis of care arrangements with and without matching transfers. According to the theoretical implications, the introduction of matching transfers should result in an increase in the demand for soft care and a fall in the demand for formal care (hypothesis 3). Moreover, depending on the decision structure within the household, these new care arrangements may involve more or less informal care (hypothesis 1 and 3).

⁴ This is because matching transfers are equivalent to in-kind-transfers and thus more generous than lump-sum transfers. In addition, any matching transfers recipient is supported by a case manager which causes additional cost to the LTC-SI.



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 Verband der Angestelltenkassen-Krankenkassen (Employee Association of LTC insurers)
 Zentrum für Europäische Wirtschaftsforschung (Centre for European Economic Research Mannheim)

In addition, hypothesis 3 suggests that a matching transfer should be an attractive alternative for all those who currently receive in-kind transfers. Since the lessening of the choice restriction in our theoretical model comes at no cost, all in-kind transfer recipients should in fact switch to matching transfers. However, this theoretical implication may empirically prove false because of neglecting increased transaction costs for households receiving matching transfers as compared to in-kind transfers. Moreover, privacy considerations may deter households with frail elderly members from choosing matching transfers if case managers are considered rather intruding.

Thus, there are a number of open empirical questions regarding the effect of matching transfers on care arrangements and the acceptability of this transfer type to begin with. All of these questions will be addressed in the model project and preliminary findings will be discussed in section 4.

3.2 Evaluation design: a social experiment

The fundamental evaluation problem when measuring the causal effect of policy measures such as the introduction of matching transfers is the fact that it is not possible to compare the recipients of a matching transfer to the same group of non-recipients, i.e. the counterfactual situation is not observable (Bloom 2005). In other words, it is only possible to observe either the state of receiving the matching transfers or not, but is impossible to observe both states at the same time. Thus, in order to derive consistent results, the researcher has to define a valid control group that behaves the same way the recipients of the matching transfer had behaved in the case of not receiving this transfer type. Only if the group of recipients (program group) and the control group are comparable with respect to all observable and unobservable characteristics that are relevant for the success or failure of a matching transfer, comparing the findings of both groups yields a valid estimate of the causal effect of the matching transfer. Thus, in order to evaluate the above questions consistently, a control group has to be constructed for the model project.

The most convincing way of constructing a control group from a scientific perspective, is to conduct a social experiment which is still an exception in Germany (Greenberg/Shroder 2004). By randomizing a group of interested frail elderly into a program and a control group, this design ensures that both groups do not differ significantly with respect to age, gender, household context etc. and thus ensures statistic comparability. Figure 2 shows the evaluation design of the model project.

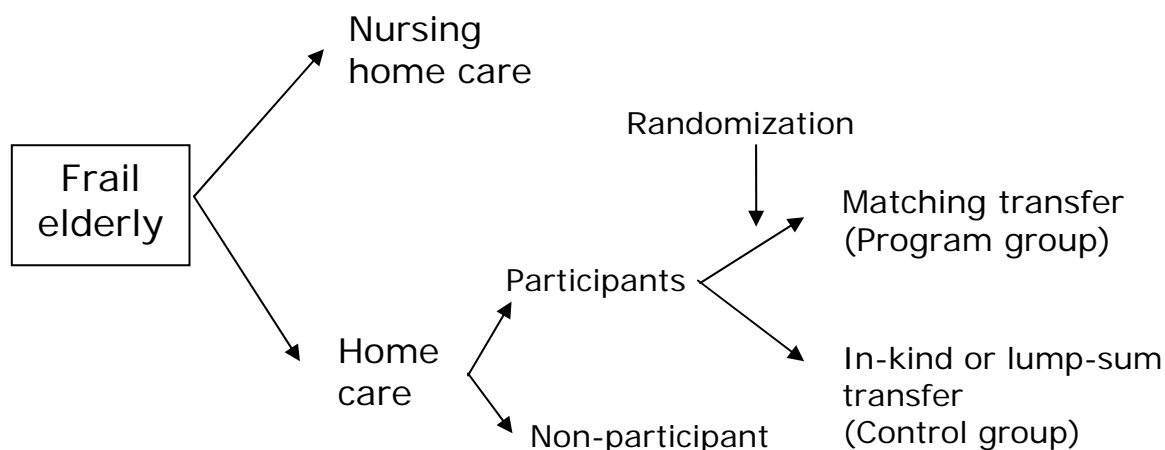


Figure 2: Evaluation design of the social experiment

As can be seen from figure 2, frail elderly in home care have to decide whether to participate in the social experiment, i.e. whether they are willing to participate in the randomization process. According to Heckman (1992), this may actually introduce some selection bias into the social experiment since individuals who are willing to participate in such an experiment may be significantly different – e.g. less risk-averse – than the group choosing the matching transfer if no randomization process was involved. This so-called randomization bias may actually be relevant in this evaluation design and may only be avoided if randomization takes place at an earlier stage. Arntz and Spermann (2005) discuss the pros and cons of two evaluation designs. Accordingly, the first best evaluation design randomizes frail elderly in home care into a program group that may choose among all types of transfers including the new matching transfer and a control group which may only choose among the old types of transfers. One major advantage of this early randomization design is that it avoids the randomization bias since all those eligible and interested in the matching transfer actually receive this transfer type. Thus, there is no uncertainty involved in choosing a matching transfer. Moreover, this design allows for testing to which extent frail elderly substitute between which types of transfers if a system with four transfer types is introduced. Therefore, this early randomization is preferable to the later randomization process shown in figure 2. However, since the first best solution comes with additional operating expenses on the part of the LTC insurers, this first best solution has been rejected in favour of the second best solution shown in figure 2⁵. Fortunately, this design ensures the statistic comparability

⁵ It is important to clarify that the employee association of LTC insurers (VDAK) that is funding the model project is not identical to what is generally called LTC insurers in this paper. This is because there is much heterogeneity among LTC insurers in Germany and there is a multitude of LTC insurers involved in the LTC-SI.

between the program and the control group such that differences in the behaviour of the groups may be attributed causally to the matching transfer. In particular, the project's aim is to survey 800 individuals in the program group and to compare them to approximately 800 individuals in the control group. The participants in both groups will be interviewed twice a year between 2004 and 2008. Thus, the above design allows for a comparison of both groups across time and thus yields valuable and mostly valid results regarding e.g. the effect of matching transfers on the stability of home care arrangements. However, as discussed, due to the randomization bias, these results may not be perfectly representative for the group of matching transfer recipients once such a system is introduced to the LTC-SI system.

4. Preliminary findings

4.1 Acceptability of matching transfers in an experimental setting among frail elderly

At the present stage (September 2005), the model project counts 261 participants, 184 of which belong to the program group and 77 belong to the control group in seven sites. Clearly, the intake period is not completed and the number of participants still diverges from the target number by several hundred participants. Thus, one natural question to ask is to what extent this lengthy intake period results from a lack of acceptability of the matching transfer or the experimental design. Apparently, contrary to the theoretical implications, not all individuals receiving in-kind transfers switch to matching transfers. A survey was conducted among all individuals who contacted the local coordinating office of the model project in order to receive detailed information on the matching transfer. At the current stage the survey has been conducted among 120 interested individuals and conveys a number of interesting information about the motivation behind the participation or non-participation decision.

Among these 120 individuals 40% decided not to participate in the social experiment. However, the uncertainty resulting from the randomization process deterred approximately only 6% of the interested individuals from participating in the social experiment. Thus, the randomization bias may have some validity, but is unlikely to be a major explanation for non-participation. By contrast, one aspect that discouraged about a quarter of all interested individuals from participating in the experiment was the fact that a matching transfer excludes any payments within the family. This is one major difference between the lump-sum transfer and the matching transfer and apparently, there is a large fraction of frail elderly who prefer care arrangements that allow for reimbursements of informal care within the family. If this is

Thus, even if VDAK supports a first best solution, other LTC insurers – especially the big players – have to accept and support such a solution. Implementation issues arising from the heterogeneity of LTC insurers will be discussed in some detail in section 4.3..

the case, the scope for a matching transfer in addition to the current transfer system may actually be limited. In particular, the combination of lump-sum payments and in-kind transfers already allows for some flexibility. Moreover, for about 10% of those not participating in the social experiment, higher transactions costs was an explanation for rejecting to participate in the experiment. Thus, the predictions of the theoretical model regarding the acceptability of matching transfers are modified in a real world where a matching transfer comes with higher transaction cost than other types of transfers.

Among those who decided to participate in the experiment, a majority did so because of the possibility of implementing individually-tailored care arrangements. In particular, more than 70% of the participants in the experiment stated that one major reason for their participation decision was the possibility to tailor their care arrangements to their special needs. Moreover, care services available with the in-kind transfer have been considered too restrictive by more than 40% of the participants. Another frequently mentioned participation reason is the support given by a case manager. Thus, the matching transfer does seem to fill an important gap by offering more flexible, individually-tailored care arrangements that are assisted by professional case managers. Moreover, the motivation behind participating in the program is consistent with the theoretical notion that matching transfers allow for a higher degree of flexibility and individually-tailored care arrangements. However, for most frail elderly, the currently available transfer system seems to be sufficiently flexible already. Therefore, the number of potential participants is probably limited which is one likely explanation for the longer intake period.

4.2 Initial situation among program and control group participants

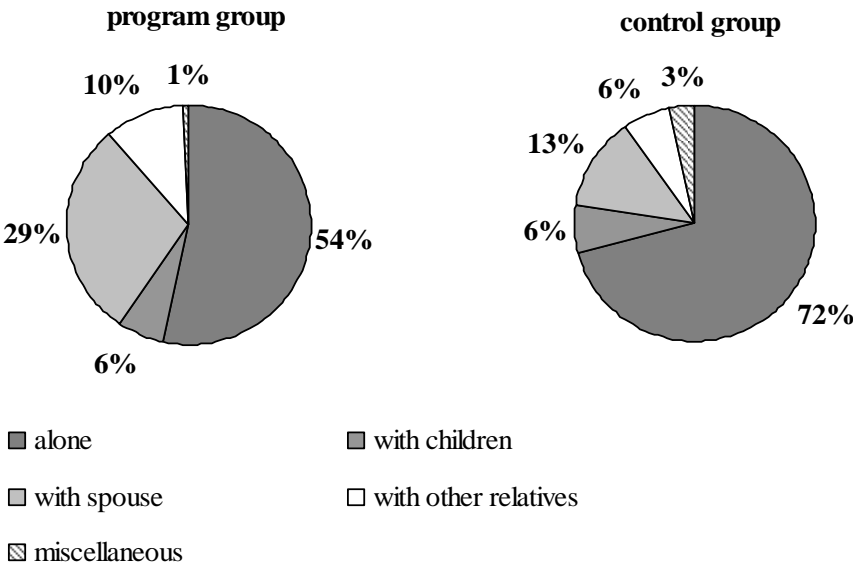
At the present stage, the 261 participants have been randomized into 184 program and 77 control group participants. The target group was randomized at each site separately. Until August 2005, initial surveys prior to the randomization are available for 124 participants in the program group and 31 participants in the control group. No follow-up surveys have been conducted so far. Thus, at the current stage, it is not possible to measure any effect of the matching transfer on e.g. care arrangements. Furthermore, site-differentiated analysis are not insightful due to low case numbers. Instead, the data will be used to describe the initial situation of program and control group participants prior to randomization, i.e. prior to receiving any matching transfers in the program group. Since individuals have been assigned randomly to a program or a control group, both groups should not differ significantly. Thus, this section takes a closer look at the comparability of both groups and thereby discusses

some preliminary findings regarding care arrangements and other aspects of the initial situation among frail elderly participating in the project.

Regarding personal characteristics only weak differences between both groups emerge: the t-statistics range from 0.2021 for tests of equality of the number of children to 0.6464 for tests of equality of occupation. Age and sex do not obtain significant differences either with an average age of 72.1 in the program and average age of 69.2 in the control group. The fraction of male participants is 33.1% in the program group and 38.7% in the control group which, again, is not a significant difference.

Since the success of the matching transfer is likely to be closely linked to the household context of the frail elderly and in particular to the availability of informal care by family members, comparability between both groups is of particular concern with respect to these dimensions. Figure 6 displays the household context, i.e. the living arrangements, of both groups in detail. First of all, note that the majority of frail elderly lives alone in both groups. Moreover, living arrangements with spouses are the second largest group for both program and control group members. However, household arrangements with spouses are more than twice as common in the program as compared to the control group. While these differences might suggest some concern regarding the comparability of results, a test of equality with a p-value of 0.2513 suggests that these differences are not significant and are thus not problematic at this stage. The fact that the majority of frail elderly live alone may hint at the fragility of care arrangements. However, the fragility of these care arrangements also depends on the availability of supporting familial networks outside the household.

Figure 6: Living arrangements of the participants

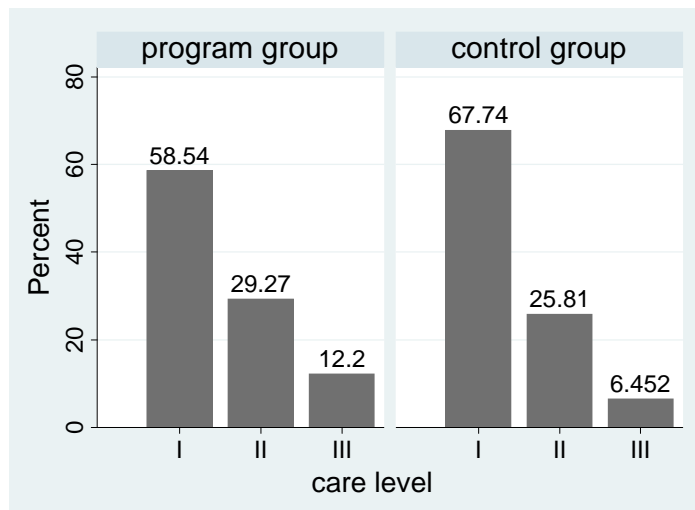


We measure the availability and strength of these informal networks by the physical distance between the home of the frail elderly and the children's places of residence as well as by the frequency of contact between parent and child. For about half the frail elderly, informal networks seem to be quite strong. The fraction of the frail elderly in the program group having children who live in the same municipality is 46%. The fraction of program group participants who are in touch with their children several times per week amounts to 42.7%. In the control group, the fraction of participants with children in the same municipality is 48.4%, while the fraction of control group participants who are in contact with their children several times per week is 45.2%. According to t-statistics, none of these differences are significant.

Comparability between the recipients of matching transfers and recipients of other transfer types is also important with respect to the approved care level⁶ and the care arrangements prior to the beginning of the experiment. Figure 7 shows the care levels at the beginning of the experiment, where no significant differences between both groups arise. Moreover, the current care level has been approved 2.8 years ago on average in the program group and 3.1 years ago on average in the control group.

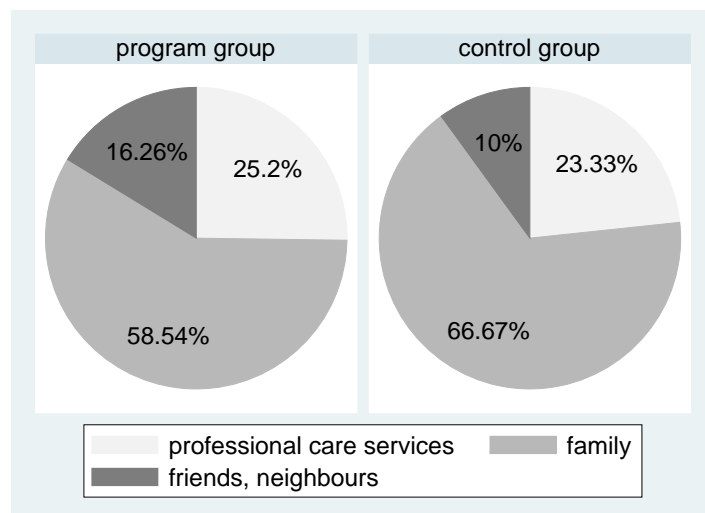
⁶ The LTC-SI system distinguishes between three care levels I-III which increase with regard to coverage in ascending order. In order to receive benefits in the first place, an eligible individual has to request benefits from the LTC-SI. An independent committee approves or rejects this applications based on a medical report.

Figure 7: Care level of the participants



Care arrangements are clearly dominated by informal care. For the majority of frail elderly in both the program and the control group, the main carer is a family member. By contrast, only around 25% of frail elderly in the program and the control group are mainly being cared for by professional service providers. When employing hotelling-statistics for tests of equality to the main carers pooled in the categories ‘professional care services’, ‘family’ and ‘friends, neighbours’, no significant results arise either. Figure 8 gives an overview over the main carers in these three categories.

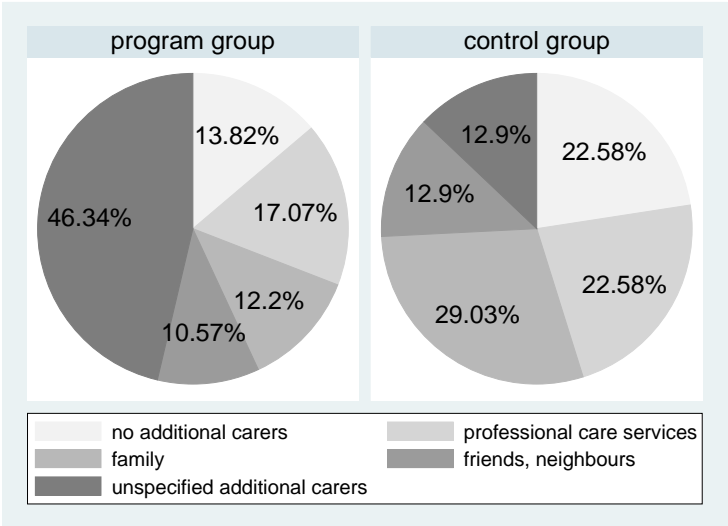
Figure 8: Main carers



Interestingly, figure 9 reveals that a fraction of 13.8% of the program group participants and a fraction of 22.6% of the control group participants do not have any other carers at their disposal besides their main care provider. These individuals may thus be considered to have frail care arrangements. Whether care arrangements of matching transfer recipients stabilize

compared to control groups participants will be one major aspect of future research once follow-up surveys have been conducted. Whether care arrangements stabilize may be the result of increasing the number of carers on the one hand and of diversifying the type of care services delivered in order to tailor care arrangements to the specific needs of the frail elderly. In order to attribute differences in care arrangements to the causal effect of the matching transfer, care arrangements should be comparable between program and control group prior to the social experiment. Regarding the type of care providers involved in care arrangements, a significant difference between program and control group evolves, probably due to rough aggregation in the category ‘unspecified other carers’ (see figure 9). Analysing the underlying differences in the separate categories, significant differences are restricted to the category of professional carers. Thus, comparability is less clear with respect to care providers in care arrangements prior to the experiment. Due to the complexity of care arrangements, however, a sample size of only 30 control group participants may drive the results at the current stage.

Figure 9: Additional carers



Diversification of care arrangements especially concerns the type of care services provided. A detailed survey of particular care services and service providers allows for the compilation of a service-carer-matrix which contrasts the type of care services on the one side and the care providers on the other side. Table 2 illustrates the percentage of people receiving help for a particular activity from a particular LTC provider. It only shows the results for the program group, since the control group exhibits only few significant discrepancies (denoted with *). Friends and neighbours are now being lumped together to “other carers” in order to reduce the complexity of the matrix.

Table 2: Percentage of participants receiving help in different fields of activity from certain LTC providers (service-carer-matrix)

Service	Children	Spouse	Other relatives	Professional carers	Other Carers
House work	25	16	13*	29	33
Shopping	29	13	19*	17	26
Telephoning	10	7	7	2	6
Preparing meals	24	19	9	18	30
Eating and drinking	9	9	7	7	6
Financial matters	31	13	14	0*	16*
(Un-)Dressing	16	15	10	32	16
Personal hygiene	13	10	10	41	15
Bathing/showering	11	10	10	43	19
Toilet	10	10	7	16	11
Movement in bed	6	9	5	10	5
Movement in flat	12	8	3	13	9
Climbing stairs	7	4	4	6	8
Movement outside	16	10	10	8	21
Using means of transport	7	5	8	4	9
Syringes/bandages	2	2	2	18	7
Taking drugs	15	14	9	23	8

Care services dominated by the formal professional sector are e.g. undressing, personal hygiene and bathing while children dominate financial matters, shopping and preparing meals. A typical service provided by other carers is house work. One important question of the model project is whether the list of care services currently provided will be extended by other soft care activities such as care aiming at the specific needs of frail elderly with dementia. For this purpose, the service-carer-matrix is an open-ended list that can be extended for new types of services.

While the service-carer-matrix already provides valuable insights into care arrangements, average expenditure of time and money across LTC providers and types of care services yield additional insights. Table 3 again only reports corresponding figures for the program group since all differences between program and control group are insignificant. The last column shows hourly earnings by LTC provider and suggests enormous differences between types of care providers. While an hour of care services provided by professional care providers costs more than 40 €, spouses appear to be the most altruistically motivated carers with only 0.2 € per hour paid as a reimbursement, closely followed by children with 0.75 € per hour.

Table 3: Average provision of hours and expenditures by type of carer in a typical week

Group of carers	Care services in hours	Expenses in €	€per hour
Children	12	9	0.75
Spouse	10	2	0.20
Other relatives	7	14	2.00
Professional carers	6	245	40.83
Other carers	16	159	9.94

Thus, differences between care arrangements may also be examined with regard to the time and expenditure structure of care services when receiving a matching transfer as compared to other transfer types. Apart from shifts in the time and expenditure structure, it will also be an interesting aspect to test for changes in hourly cost of certain care services, especially professional services, as a result of introducing matching transfers. Since matching transfers combined with case management allows for negotiating prices in the care sector instead of applying the previously fixed price levels, there may be some new scope for pricing in the care service sector.

4.3 Implementation issues

While, by now, the basic structures of the social experiments have been implemented at the various sites, there are still a number of implementation problems that are partially responsible for relatively low numbers of participants at this stage. While section 4.1 suggests that the group of potentially interested frail elderly may be smaller than initially expected, there are also a number of institutional aspects that aggravate the recruitment of participants. First of all, one major challenge to case managers at the various local sites is to inform LTC insurers, care providers, doctors and hospitals to name just a few local players. This information function is of vital importance if the program is to gain ground such that the possibility of participating in the model project is well known to the target group of frail elderly. For this purpose, local players which can multiply the information released by the project management and local case managers have to be activated. In particular, LTC insurers are the most important players in the distribution of information among the target group since they are able to send information to their insured members by mail. However, there is a large heterogeneity among LTC insurers that makes it difficult to activate these networks. In particular, LTC insurers tend to be locally organized such that corresponding networks have to be activated separately at each site. Moreover, there is a multitude of LTC insurers. In fact, almost each larger occupational group or sector has its own LTC insurance. Therefore, it is in

fact necessary to concentrate on few large local LTC insurers. However, not all of these LTC insurers support and assist the model project. In particular, the largest LTC insurer, AOK, which is the largest insurance at all sites, did not provide any help at the beginning. This is because AOK is not part of the employee association of LTC insurers (VDAK) that is funding the model project. As a consequence, AOK need not provide any resources in order to support the project. Thus, the functioning of local information networks strongly depends on the goodwill of central players in these agencies. While these networks have been working well at some sites, there has been almost no support at other sites. Recently, there has been another attempt by VDAK to convince other LTC insurers to support the project. Thus, the heterogeneity and multitude of LTC insurers in Germany proves to be a difficult challenge to an effective implementation of the social experiment.

Another aspect that aggravates the implementation of matching transfers at the various sites is the opposing attitude of the majority of local professional care providers towards matching transfers. As long as professional care providers refuse to participate in the project, it is unlikely that a changing demand for care services induced by the matching transfer translates into noticeable shifts in the supply of care services. In other words, the effect of introducing a matching transfer is likely to be negligible in this case. Thus, it is necessary to convince professional care providers that a matching transfer is not a cost reduction device of the LTC insurers, but a new type of transfer that offers opportunities to further differentiate and expand their services. However, there are strong fears that the possibility of negotiating prices and the possibility of employing an expanded spectrum of care providers⁷ ultimately puts pressures on them. While the fixing of prices between LTC insurers and professional care providers in the old system has always been criticized by the care providers, this old system is now being highly appreciated for guaranteeing a minimum price level for professional care services. While this is clearly a paradoxical situation, these fears have to be taken seriously. One positive impetus may actually come from other professional care providers. While the majority of care providers oppose the introduction of a matching transfer, a minority of care providers appreciate the project and actively try to adjust their care services to match the special needs of the matching transfer recipients. These care providers all report that matching transfers allow them to develop care arrangements that have not been possible before and that they consider this as a favourable development for their care services. Such positive anecdotal

⁷ Under the old system with in-kind transfers, professional care providers have to have an agreement with the LTC insurers that commits care providers to maintain certain standards such as a specific share of care professionals among their employees in order to receive money from the insurers. By contrast, matching transfers recipients can also buy services from other care providers who do not possess any agreement with the LTC insurers. This will clearly open up the LTC market for a variety of new care providers.

evidence may actually help in convincing an increasing number of professional care providers to actively participate in the implementation of matching transfers at the various sites.

There are also a number of additional minor implementation problems one of which is the efficient and timely processing of matching transfer payments to the recipients. Also, several sites proved to be too small geographically such that only a limited number of frail elderly have been eligible for participation. All of these obstacles to the functioning of the social experiment have been identified in an initial implementation analysis throughout the first month of implementation. Some of the problems have been mitigated. Two sites have now been extended geographically in order to ensure a sufficiently large target group. Other aspects such as the opposing attitudes of some professional care providers continue to be an obstacle and call for further local initiatives in order to convince care providers to participate in the reorganization of care services that is induced by the introduction of matching transfers. Only if major implementation issues get resolved, may we expect the number of participants to rise substantially.

5. Conclusions

With increasing cost pressures since its introduction in the mid nineties, the current long-term care social insurance (LTC-SI) in Germany has come under severe reform pressures. One natural starting point for reducing cost pressures is to induce a higher share of frail elderly to remain in the less costly home care as compared to nursing home care. Thus, one main objective of the reform of the LTC-SI is a higher degree of flexibility in the LTC-transfer system that allows for more stable home care arrangements. One way to introduce more flexibility to the current system is to allow for a matching transfer that enables frail elderly to implement individually-tailored care arrangements with the assistance of professional case managers.

This paper looks at the introduction of matching transfers from both a theoretical and an empirical perspective. Using a household bargaining approach, the theoretical model derives a number of testable implications regarding the effect of matching transfers on the care arrangements chosen by households with frail elderly members. In particular, our theoretical model predicts that a matching transfer may actually increase the level of informal care by family members and friends such that home care arrangements are stabilized and entrance into a nursing home is expected to be delayed.

In the empirical part of the paper, we introduce a social experiment that implements matching transfers at several sites across Germany. One main objective of this project is to empirically

test whether dynamic cost efficiencies can actually be realized while improving the quality of life among the recipients of matching transfers at the same time. Methodologically, the project is designed as a social experiment which randomizes a group of participants into a program group of matching transfer recipients and a control group of in-kind or lump-sum transfer recipients. This randomization ensures that differences among the two groups may be attributed causally to the matching transfer.

At the current stage, approximately 270 frail elderly participate in the program across all sites and only the survey prior to randomization but no follow-up surveys have been conducted. Thus, we only discuss the initial situation among program and control group participants and find no evidence that both groups significantly differ with respect to personal characteristics, living or care arrangements at this initial stage. As a consequence, differences between both groups in the follow-up interviews should be attributable to the matching transfer.

One important finding at this early stage also concerns the acceptability of matching transfers in an experimental setting. While our theoretical model implies that matching transfers are highly preferable to in-kind transfers, this does not hold in a real world due to higher perceived transaction costs and a perceived loss of privacy compared to in-kind transfers. Moreover, there are a number of individuals who decide not to participate in the experiment because the matching transfer precludes reimbursements of informal care within the family. Thus, we find a number of reasons why a matching transfer is an attractive alternative only for a small group of individuals who want to implement individually-tailored care arrangements that are not possible with the current transfer system. While this may already be an explanation for the relatively low numbers of participants at this stage, we also discuss a number of additional implementation issues. In particular, the heterogeneity and multitude of LTC insurers makes it difficult to activate important networks that may help in spreading information about the project among the frail elderly. Moreover, opposing attitudes towards matching transfers by a majority of professional care providers is a major obstacle for the implementation of matching transfers. Only if the implementation problems get resolved or at least mitigated, can we expect the number of participants to rise substantially. This is necessary if complex questions e.g. regarding dynamic cost efficiency are to be evaluated scientifically. Anecdotal evidence, at least, already points at an increasing subjective quality of life among matching transfer recipients and a stabilization of care arrangements such that nursing home care has been prevented in several cases.

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Appendix A

Proof of Proposition 1

Inserting (12), (13) and (14) into (9) to (11) delivers a system of three equations which can be written as:

$$(A1) \begin{pmatrix} -(P^F U''^p P^F + AH_F V''^p AH_F + AV'^p AH_{FF}) & -AH_F V''^p AH_I & -(P^F U''^p P^Q + AH_F V''^p AH_Q) \\ -(P^Q U''^p P^F + AH_Q V''^p AH_F) & -AH_Q V''^p AH_I & -(P^Q U''^p P^Q + AH_Q V''^p AH_Q + AV'^p H_{QQ}) \\ AH_I V''^d AH_F & AH_I V''^d AH_I + AV'^d H_{II} + WU''^d W & AH_I V''^d AH_Q \end{pmatrix} \begin{pmatrix} dF \\ dI \\ dQ \end{pmatrix} = \begin{pmatrix} -P^F U''^p dT^{g,p} + H_F V'^p (1 - \eta_G^p) dA \\ -P^Q U''^p dT^{g,p} + H_Q V'^p (1 - \eta_G^p) dA \\ WU''^d dT^{g,d} - H_I V'^d (1 - \eta_G^d) dA \end{pmatrix}$$

The vector of constants in (A1) contains the elasticity of marginal utility of health which is defined as follows: $\eta_G^d \equiv -\frac{GV''^d}{V'^d}$ for the daughter and

$$\eta_G^p \equiv -\frac{GV''^p}{V'^p} \text{ for the parent.}$$

The determinant of the coefficient matrix in (A1) is found to be:

$$(A2) \quad Det = -\left(P^F U''^p P^F AV'^p H_{QQ} + AV'^p H_{FF} P^Q U''^p P^Q + AV'^p H_{FF} AV'^p H_{QQ} \right) \left(AH_I V''^d AH_I + AV'^d H_{II} + WU''^d W \right) - \left(AH_F V''^p AH_F V'^p H_{QQ} + AH_Q V''^p AH_Q AV'^p H_{FF} \right) \left(AV'^d H_{II} + WU''^d W \right)$$

The assumption of declining marginal products of health services, $H_{FF}, H_{QQ}, H_{II} < 0$, combined with the assumption of strict concave utility functions, that is $U^{np}, U^{nd}, V^{np}, V^{nd} < 0$, leads to $Det = -(+)(-) - (+)(-) > 0$. The determinant is unambiguously positive.

By applying Cramer's rule the multipliers turn out to be:

$$(A3) \quad \frac{dF}{dT^{s,p}} = -\frac{1}{Det} \cdot P^F U^{np} AV'^p H_{QQ} (AH_I V^{nd} AH_I + AV'^d H_{II} + WU^{nd} W) > 0$$

$$(A4) \quad \frac{dQ}{dT^{s,p}} = -\frac{1}{Det} \cdot P^Q U^{np} AV'^p H_{FF} (AH_I V^{nd} AH_I + AV'^d H_{II} + WU^{nd} W) > 0$$

$$(A5) \quad \frac{dC^p}{dT^{s,p}} = -\frac{1}{Det} \cdot \left[AV'^p H_{FF} AV'^p H_{QQ} (AH_I V^{nd} AH_I + AV'^d H_{II} + WU^{nd} W) + (AH_F V^{np} AH_F V'^p H_{QQ} + AH_Q V^{np} AH_Q AV'^p H_{FF}) (AV'^d H_{II} + WU^{nd} W) \right] > 0$$

$$(A6) \quad \frac{dI}{dT^{s,p}} = \frac{1}{Det} \cdot AH_I AV'^p AU^{np} V^{nd} (P^Q H_Q H_{FF} + P^F H_F H_{QQ}) < 0$$

$$(A7) \quad \frac{dC^d}{dT^{s,p}} = 1 - W \frac{dI}{dT^{s,p}} > 0$$

$$(A8) \quad \frac{dI}{dT^{s,d}} = -\frac{1}{Det} \cdot AV'^p U^{nd} W \left[(P^F U^{np} P^F + AH_F V^{np} AH_F + AV'^p AH_{FF}) H_{QQ} + AH_{FF} (P^Q U^{np} P^Q + AH_Q V^{np} AH_Q) \right] > 0$$

$$(A9) \quad \frac{dF}{dT^{s,d}} = \frac{1}{Det} \cdot WU^{nd} AH_F V^{np} AH_I AV'^p H_{QQ} < 0$$

$$(A10) \quad \frac{dQ}{dT^{s,d}} = \frac{1}{Det} \cdot WU^{nd} AV'^p AH_{FF} AH_Q AH_I V^{np} < 0$$

Appendix B

Proof of Proposition 2

Because of the binding choice restriction we have $P^F F = T^S$ and $Y^P = C^P + P^Q Q$. Differentiation of these equations gives:

$$(B1) \quad dF = (1/P^F)dT^S$$

$$(B2) \quad dC^P = -P^Q dQ.$$

Equations (B1), (B2), (10), (11), (12) and (14) constitute a model which - after some manipulation - can be written as:

$$(B3) \quad \begin{pmatrix} -AH_Q V''^p AH_I & -(P^Q U''^p P^Q + AH_Q V''^p AH_Q + AV'^p H_{QQ}) \\ AH_I V''^d AH_I + AV'^d H_{II} + WU''^d W & AH_I V''^d AH_Q \end{pmatrix} \begin{pmatrix} dI \\ dQ \end{pmatrix} = \begin{pmatrix} AH_Q V''^p (AH_F / P^F) dT^S + H_Q V'^p (1 - \eta_G^p) dA \\ -AH_I V''^d (AH_F / P^F) dT^S - H_I V'^d (1 - \eta_G^d) dA \end{pmatrix}$$

The determinant of the coefficient matrix,

$$(B4) \quad Det = (AV'^d H_{II} + WU''^d W)(P^Q U''^p P^Q + AH_Q V''^p AH_Q + AV'^p H_{QQ}) + AH_I V''^d AH_I (P^Q U''^p P^Q + AV'^p H_{QQ}),$$

is positive.

Using the Cramer-rule delivers:

$$(B5) \quad \frac{dQ}{dT^S} = -\frac{1}{Det} AH_Q V''^p (AH_F / P^F) (AV'^d H_{II} + WU''^d W) < 0$$

$$(B6) \quad \frac{dI}{dT^S} = -\frac{1}{Det} AH_I V''^d (AH_F / P^F) (P^Q U''^p P^Q + AV'^p H_{QQ}) < 0$$