Lifting the Burden: State care of the elderly and the location and labor supply of adult children

Julie R. Kolstad* Katrine V. Løken† Shelly Lundberg‡

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Preliminary draft

Abstract

In this paper, we use a 1998 reform in the federal funding of local home-based care for the elderly in Norway to examine the effects of formal care expansion on the labor supply decisions and mobility of middle-aged children, particularly women. In preliminary results, we find significant positive impacts of formal care expansion on the labor supply of adult children of single elderly parents, including decreases in the probability of work absences longer than 2 weeks, and increases in the probability of working. These effects are strongest for daughters (relative to sons), for first-born children, and for daughters living in the same muncipality as their parents. Our results provide evidence of substitution between formal home-based care and informal care by daughters.

Keywords: Formal and informal care, elderly, welfare state, women's career
JEL codes: J14, J22

*Department of Economics, University of Bergen, E-mail: julie.kolstad@econ.uib.no
†Department of Economics, University of Bergen, E-mail: katrine.loken@econ.uib.no
‡Department of Economics, University of California, Santa Barbara, E-mail: lundberg@econ.ucsb.edu

1 Introduction

Around the world, societies are facing the challenges imposed by aging populations. The fiscal and personal burdens that care of the elderly place on a working-age population that is shrinking in relative size are of particular concern to policy-makers. Expanding state care is expensive but may, if it substitutes for informal care provided by adult children, increase hours worked and labor force participation by middle-aged children. This substitution, in addition to its implications for the quality of care, may partially offset the fiscal impact of public care responsibilities by increasing the tax base. It is important to understand the degree of substitution between formal (state-provided or purchased) and informal (family-provided) eldercare, and the effect that care responsibilities have on the labor market outcomes of adult children.

In this paper, we use a 1998 reform in the federal funding of local home-based care for the elderly in Norway to examine the effects of formal care expansion on the labor supply decisions and mobility of middle-aged children, particularly women. The goals of this policy change included enabling the elderly to live in their own homes as long as possible, and equalizing the availability of care services across municipalities, and it resulted in arguably exogenous variation in the degree to which formal care services expanded across localities. We find significant positive impacts of formal care expansion on the labor supply of women with single elderly parents, including decreases in the probability of work absences longer than 2 weeks, and increases in the probability of working. These effects are strongest for daughters (relative to sons), first-born children, and daughters living in the same muncipality as their parents. Our results provide evidence of substitution between formal home-based care and informal care by daughters.

2 Literature review

Most of the personal care received by disabled adults and the frail elderly is informal–provided by family, friends, and neighbors rather than by professional caregivers who are provided by the public sector or hired in the market [OECD, 2005]. A recent U.S. survey found that 27 percent of adults reported caring for another adult in the preceding 12 months.[1] Spouses are the most important source of eldercare, followed by adult children, though a study of the SHARE data found that other relatives and friends provide as much home care to the elderly as children [Kalwij et al., 2012].

[1]The amount of time devoted to care varied with the needs of the recipient and the availability of other care providers. Half of the caregivers reported spending 8 hours or less per week on care, while 11 percent spent more than 40 hours per week in caregiving activities (NAC/AARP 2009).

Even in countries that provide comprehensive social services, such as Norway, time use data shows that spending time caring for elderly parents is very common, even for working adults. On an average work day in 2000, 8 percent of the working population spent an average of 1.2 hours taking care of a parent (Vaage 2002). Among 45 to 65 year olds who still have at least one parent alive, 70 percent report that they combine work for pay and the provision of informal care to their parents (Gautun 2008).[2]

Adult children may be assisting their elderly parents because formal (public) services are inadequate or incomplete, or because they place some direct value on these interactions with their parents. Whatever the motivation, the time and energy devoted to taking care of elderly parents is likely to curtail other activities such as market work and leisure. More intensive caregiving of frail or disabled parents may impose higher costs, including loss of employment, reduced wages, or restricted mobility.

The association between informal caregiving and labor market outcomes has been extensively studied, but controlling for the likely selection of individuals with inferior labor market opportunities into care has made it difficult to establish causal effects. A recent survey, based primarily on studies using U.S. or U.K. data, found that caregivers were just as likely to be in the labor force as noncaregivers of the same age, once coresident and very intensive providers of care were excluded, but that caregiving is associated with moderate reductions in work hours (Lilley et al. 2007). Informal caregivers who work appear to experience a wage penalty, all else equal Carmichael and Charles [2003], Heitmueller and Inglis [2007]. The conflict between work and care is also emphasized by Gautun and Hagen [2010], who report that employees are more likely to express a preference for reduced or flexible working hours when they have care obligations for their elderly parents. A large literature chronicles the relationships between caregiving and other outcomes such as health, both physical and mental (see the review in Bianchi et al. [2012]) and life satisfaction [Leigh, 2010], which may also have secondary impacts on employment.

The labor market consequences of informal caregiving may also vary across groups. The majority of carers are female, and several studies find that women are more likely than men to experience negative effects on labor market outcomes [Ettner, 1995, 1996, Heitmueller and Inglis, 2007], though these effects may be more persistent for male caregivers [Fevang et al., 2011]. The intensity of caregiving is, not surprisingly, an important determinant of labor market costs (Lilley et al. 2007, [Ettner, 1996]),

[2]Non-family assistance is also important, however. In a 1995 national health survey, 14 percent of men and women aged 80 or more report receiving assistance from family and friends during a14-day period, while 22 percent received formal services during the same period (Norway, 1999).

and Carmichael and Charles [2003] find that the impact of informal caregiving varies with the level of commitment to the labor market (hours worked).

Most existing studies rely on cross sectional data and, due to selection effects, probably overestimate the causal effects of caregiving on labor market outcomes. Exceptions include Leigh [2010], who uses panel data and finds that, though the initiation of caregiving has a modest negative impact on labor force participation, this effect is a fraction of the apparent association in the cross-section. Individual fixed-effect models of other labor market outcomes result in similarly small, or insignificant, effects of care. Spiess and Schneider [2003] find asymmetric effects of caregiving responsibilities on work hours in a fixed-effects model—initiating care results in reduced work hours, but terminating care does not increase hours. Fevang et al. [2011] use Norwegian register data to examine the employment rates of sons and daughters in the years immediately prior to a parent's death. They find decreases in employment and increased dependence on sickness insurance and other social security benefits during this period, when the parent's need for informal care giving is likely to be high.

The effect of expansions in public provision of formal care of the elderly, or subsidies for purchased formal care, on the employment and other labor market outcomes of their children will depend on the extent to which formal care substitutes for (or "crowds out") informal care. Formal care expansions that focus on home-based assistance may have limited effects on informal care if they delay entry to nursing homes and other types of institutional care. Policy changes such as expansions in public care and changes in reimbursement of market services have been used to examine the interactions between formal and informal care. Several studies have found that more generous public home care increases the probability that the elderly live independently and delay institutionalization [Pezzin et al., 1996, Orsini, 2010] and result in modest decreases in informal care [Ettner, 1995, Pezzin et al., 1996, White-Means and Rubin, 2004, Stabile et al., 2006], but others have found no evidence of crowding-out [Motel-Klingebiel et al., 2005, Christianson, 1988]. Substitution between informal care and either home-based or institutional formal care is likely to depend upon the degree of disability of the care recipient. Bonsang [2009] distinguishes between skilled and unskilled formal care, and finds that informal care substitutes for unskilled formal care, with this substitutability declining as disability increases, but that informal care is a weak complement to skilled nursing care independently of the level of disability.

In this study, we use Norwegian registry data to examine the impact of a formal care expansion on the labor market outcomes for children directly, including em-

ployment, earnings, and work absence, as well as on their residential location (Note: location results are not yet available). This high-quality administrative data enables us to link population cohorts of elderly parents with their adult children and their tax and social service records. A reform that equalized formal home-care coverage for the elderly across municipalities resulted in large expansions of coverage in municipalities that initially provided limited home-care services and small expansions in other municipalities, and we apply difference-in-difference models to compare the labor market responses of daughters (and sons) of elderly parents before and after the reform in treatment and control muncipalities.[3]

3 Background & the reform

3.1 Formal care in Norway before the reform

In the mid-1960s, the foundations of a modern welfare state were being established in Norway. Relieving families from some of the burden of care for young, old, and disabled members was an important component of this transformation and in 1964 legal responsibility for care of the elderly in Norway was shifted from the family to the public sector.[4] During the 1970s, public resources devoted to elder care increased by more than 200%. Most of the expansion was in the form of home-based care (which includes care in both private homes and assisted-living facilities); there was a small decrease in number of institutional care (nursing home) slots during the same period.

Historically, government responsibility for elder care has been divided between municipalities, counties and central authorities, with the balance shifting during the past several decades. The 1980s was a period of decentralization, with increased focus on local variation in needs of the elderly based on geographical and cultural diversity. A set of reforms in 1984 and 1988 transferred all responsibility for elder care, including health services and nursing home administration, to the local municipalities. Federal grants earmarked for eldercare were replaced by transfers to municipal budgets based on estimated need (on the basis of demographics and income) in each municipality. With decentralization, the municipalities were free to allocate their budgets between different sectors, and the result was that local variation in elder

[3]Havnes & Mogstad (2011) use a similar strategy and an uneven expansion of child care services across Norwegian municipalities to examine the impact of formal child care on maternal labor supply.

[4]Information on the history of formal elder care in Norway is gathered from the Ministry of Health and Care Services Report to Parliament No. 25 (2005-2006). http://www.regjeringen.no/nb/dep/hod/dok/regpubl/stmeld/20052006/stmeld-nr-25-2005-2006-/4.html?id=200926

care coverage increased. This variation, and later convergence, across municipalities will be important for our identification and forms the background for the reform in 1998.

3.2 The 1998 reform

The care needs of a growing elderly population exerted considerable pressure on municipal budgets by the mid-1990s, and coverage rates for both home-based and institutional care for the population aged 80 and above were declining. Also, the large discrepancies in care coverage that had developed across municipalities were seen as inequitable.[5] An action plan for the elderly was adopted by the federal government that included grants to municipalities to expand the capacity of the health care system to deliver home-based care, beginning on January 1, 1998 [og Helsedepartementet', 1997]. Care for elderly and disabled were to be integrated in the municipalities' programs, with an explicit goal that all municipalities should be able to offer assistance 24/7 to at least 25% of those aged 80+.[6]A more explicit goal was to increase the number of spaces in adapted apartments and institutions between 1998 and 2001, and to increase labor input in the sector nationwide by 6000 work years [Borge and Haraldsvik, 2006]. Most of the expansion in services took the form of home-based care provided in adapted apartments rather than institutional care in nursing homes, with an increased emphasis on providing home-based medical treatment as well as practical assistance. This option provided cost advantages, compared to institutions where highly-qualified personnel are available at all hours, or to services provided to elderly living in private homes, and also maintained more flexibility in service provision and the preservation of greater autonomy for the elderly population.

Municipalities with the lowest pre-reform coverage (both in terms of the number of spaces and the quality of spaces), experienced the largest post-reform increases in home-care coverage rates as coverage rates converged in response to federal policy. Figure 1 shows the trends in home-based care coverage rates for the population 80+ for two groups of municipalities–those with pre-reform coverage rates below the median (treatment group) and municipalities with high pre-reform coverage (control group). The overall trend in coverage was negative before the reform, reflecting the failure of local service provision to keep pace with the increasing elderly population. There was a relatively large difference between control municipalities and treatment municipalities with respect to coverage rates in home-based services before the reform,

[5] There is a large municipal variation in resource base, geographical constraints, tax bases etc.

[6]The focus of this study is on the elderly population, and although the reform affected the services provided to disabled persons as well as the elderly, the evidence presented in the coming paragraphs will be concentrated on the elderly group.

with control municipalities providing home-based care to more than 40% of the elderly, while coverage in the treatment municipalities drifted down to 33-34%. After the reform, there is a clear pattern of convergence consistent with the announced goal of the municipal grants program. This is especially pronounced after 2000, when newly-built facilities were likely to be completed. Table 1 shows that pre-reform coverage and the age distribution of the population were important determinants of post-reform coverage growth.

Institutional care coverage in treatment and control municipalities follows a very different pattern. Figure 2 shows that control municipalities had slightly lower rates of institutional coverage than treatment numicipalities (in contrast to the large discrepancies in home-based care), and there is no difference in the post-reform (modestly declining) trend. This pattern shows that the home care expansion in treatment localities did not come at the expense of institutional care, and is consistent with the government's stated strategy to emphasize home-based care in combating coverage discrepancies across municipalities [Daatland and Veenstra, 2012]

4 Empirical strategy

To estimate the effect of an expansion in the availability of public home-based care of the elderly on the labor market outcomes of their adult children, we apply a DinD approach that exploits the differential post-reform availability of federal funds in municipalities with different pre-reform levels of care coverage. The federal grants program initiated in 1998 caused a larger expansion of home-care slots in municipalities that had initially low coverage rates. Since the actual expansion of care facilities in each municipality may be correlated with labor market conditions that also affect our outcome variable,[7] we use the pre-reform coverage level as an indicator of the actual supply shock faced by the local authorities.

To define treatment and control groups, municipalities are ordered according to their average level of home-based care coverage in 1996 and 1997. Municipalities with coverage rates below the median are classed as *treatment municipalities*, and muncipalities with coverage above the median are *control municipalities*. Figure 1 shows the convergence in average coverage rates between these two groups of municipalities after the reform in 1998. We compare the change in labor market outcomes of sons and daughters of elderly parents before and after the reform in treatment municipalities where, on average, federal funding for formal care for the

[7]For example, municipalities could expand elder care in response to a decline in female employment (though government documents do not mention this among the many possible reasons for expanding elder care).

elderly expanded a lot, with the change in these outcomes in control municipalities that experienced smaller care coverage increases.

The main regression model is the following:

$Y_{it} = \alpha_1 + \alpha_2 Treat_i + \alpha_3 Post_t + \alpha_4 (Treat_i * Post_t) + \alpha_5 X_{it} + \epsilon_{it}$

where i indexes the individual, and t, time. Y is the outcome(s), $Treat$ is 1 for individuals in treated municipalities, 0 for individuals in control municipalities, $Post$ is 1 in and after 1998, 0 before 1998. X is a set of control variables including year and municipality fixed effects, parent age and gender, and child age, education, birth order and number of siblings, and ε is an i.i.d. error term. Following Baker, Gruber and Milligan (2008) and Havnes and Mogstad [2011] we interpret α_4 as the intention to treat effect or the reduced form effect of the reform on outcomes Y. The treatment effect on the treated is found by dividing the intent to treat by the relative change in the number of elder care slots in the treatment vs. control municipalities.

The DinD specification identifies the treatment effect as the change in the labor supply behavior of adult children after the reform in the treatment municipalities relative to the post-reform change for a matched population in the control municipalities. This controls for unobserved differences in the determinants of labor supply across municipalities and across years. Since municipal fixed-effects are included, municipal characteristics that may be correlated both with the pre-reform level of eldercare coverage and with labor market outcomes do not bias our results.

Appendix Table 1 provides a detailed comparison of the demographic, economic, fiscal, and political characteristics of treatment and control municipalities in 1997, the year before the reform. With the exception of the home-based care coverage rate, the average differences between these municipalities are extremely small. Control muncipality populations are slightly better-educated, more likely to be married, and more urban, and per capita unrestricted budgets are about 15% higher. Municipalities with higher care coverage rates do, however, have a higher share of socialist votes and are more likely to have a socialist mayor.

Our key identifying assumption is that the change in labor market outcomes for sons and daughters before and after the eldercare reform would have been the same in treatment and control municipalities in the absence of the reform–that is, that the low eldercare coverage in treatment municipalities is not a proxy for other unobserved determinants of labor market trends. To the extent that differential trends are associated with observables, such as education, controls in the DinD model deal with the problem. Figure 3 shows that trends in income, disposable income, and employment rates are very similar in treatment and control municipalities, but this does not eliminate this concern. However, we can address this concern with DinDinD

models that compare the relative change in labor market outcomes for women with and without potential care responsibilities, since labor market trends should affect both populations identically. Two possible comparison samples are women who are the same age as daughters in our main sample, but with younger parents who are less likely to need care, and a sample of women with no surviving parents. These models (not yet implemented, though we include a preliminary model with younger parents) can also address one final issue–the possibility of spillover effects from the expansion of home-based elder care on employment opportunities for middle-aged women in the care sector. These spillover effects would affect both populations of women, so the impact of the care expansion would be identified with minimual assumptions.

5 Data

Our data is based on administrative registers provided by Statistics Norway, and cover the entire resident population of Norway from 1992 to 2005. For each year, we have individual demographic information (including gender, month of birth, and marital status), socio-economic data (including years of education, earnings, sickness absence and disability retirement), and municipality of residence. The data contains unique identifiers that makes it possible to match children to their elderly parents. In addition we have a separate source of municipality data from the Norwegian Social Science Data providing information on types of elder care from 1992 onwards and population by age for all municipalities across time. The coverage and reliability of Norwegian registry data are considered to be exceptional, as illustrated by the fact that they received the highest rating in a data quality assessment conducted by Atkinson et al. [1995].

Our sample consists of men and women with surviving elderly parents who are single or widowed and at least 75 years old. Though we present results for both men and women, we focus our discussion and robustness checks on the sample of daughters. Our outcome variables include the adult child's annual income and indicators of labor supply and work absence. Earnings are measured as total gross pension-qualifying earnings reported in the tax registry. These measures are not top-coded and include labour earnings, taxable sick benefits, unemployment benefits, and parental leave payments. The market work dummy is set equal to one (as in Havnes and Mogstad) if an individual earns more than two times the minimum gainful activity level, which is set by the Government annually. We test whether our results are sensitive to alternative cut-offs. The sickness absence variable is a dummy for whether you have received public benefits (requiring physician authorization) for a work absence of at

least two weeks, and we also measure days of insured absence. Disability is a dummy variable indicating that an individual has been granted a disability pension.

Table 2 shows descriptive statistics for the main dependent variables–labor supply, earnings, and work absence for the children of single elderly parents. The first column shows the mean value of the outcome variables for daughters in the treated municipalities in the pre-reform period. We see that 13% of daughters are absent from work for at least 14 consecutive days during the year, increasing to 17 % when conditioned on working, and that the average period on public sickness leave is 13.5 days. Only 1% per year receive a disability pension . Nearly 70% of daughters work and, of these, 78% work full time.

The next two columns give the differences in means between the treatment and control municipalities during the pre-reform period and the post-reform period. In the pre-reform period daughters in treatment and control municipalities have the same level of sickness absence while after the reform both the relative rate and duration of sickness absence in the treatment municipalities falls significantly below that in the control municipalities. For disability pension receipt there are no substantial differences between treatment and control municipalities in either the pre-reform or the post-reform period. Daughters in the treatment municipalities have lower labor supply and earnings during the pre-reform period, but these differences shrink modestly in the post-reform. These results suggest that the expansion of formal care for the elderly may have had a positive effect on the labor supply of daughters, and to have reduced lengthy absences from work.

Figure 4 graphs the six outcomes over time for the treatment and control municipalies and shows that the trends between treatment and control municipalities are very similar before the reform. There is some convergence in 1997 for many of the outcomes which perhaps indicates that muncipalities may have responded to the announcement of the reform before federal grants were available. We also see indications of this in Figure 1.

6 Results (preliminary)

Table 3 shows the intention to treat effects from a differences-in-differences model with municipality fixed effects. This gives the reduced form effect of the reform. The results mirror the conclusions from the descriptives in Table 1. Daughters in treatment municipalities after the reform decrease their sickness absence rates by about 1 percentage point compared to daughters in control muncipalities. This translates into an effect of about one day less absent from work during a year–a very

large ITT effect. We also find a small but significant positive effect of the reform on employment. For sons, there are small effects on employment and the rate (but not length) of sickness absence.

Table 4 reports the results of different specifications that exclude part of our sample. The results are remarkably robust. The estimated effect of the reform is very similar when we drop the three largest cities in Norway or the extreme rural municipalities. If anything the effects are stronger when we exclude the municipalities (10%) with highest and lowest pre-reform coverage rates, so our results are not driven by extreme outliers (municipalities with very high or very low coverage are typically the very small or large municipalities).

Table 5 and 6 presents estimates for sub-groups that we expect to be more or less affected by the expansion of formal eldercare. The work and work absence impacts of the reform are significant only for daughters who live in the same muncipality as their mother, which suggests that formal home care substitutes for local informal care, but not for the care provided by more distant children. The sickness absence and employment effects are strongest and most precisely estimated for daughters in their 40s, but the effects on length of work absence are particularly large for the oldest group of daughters. We do see larger effects, particularly for employment, on first-born rather than later born daughters but number of siblings, surprisingly, has no consistent effect.

Table 7 reports the results of a first set of placebo tests, which estimate the same DinD models with an alternative sample of single and widowed parents between age 60 and 70. These parents is much less likely to require care than parents 75 and over, and so their daughters should be less affected by the expansion of formal care. However, any differential trends in women's labor market outcomes between the treatment and control municipalities should be reflected in the outcomes for this sample as well. There are no significant effects for this sample. The results in Table 8 use these daughters of younger parents as a control sample in a DinDinD specification. The results for sickness absence rates are still significant in this model, but other coefficients, though significant in magnitude to the DinD models, are now imprecisely estimated.

7 Conclusion

Using variation across municipalities in the impact of a Norwegian reform of federal funding for care of the elderly, we find robust evidence that the employment and work absences of middle-aged women with single elderly parents are affected by expansions

in public home-based care. Our estimates of changes in the probability of working and in rates of sickness absence are centered on about 1 percentage point, and the duration of insured sickness absences increased by about 1 day per year in treatment municipalities compared to control municipalities. Effects are largest for women, for daughters who live near their parent, and for first-born daughters. Previous estimates of the degree of substitution between informal care and home-based formal care have been mixed, but our results provide support for such substitution. In future versions of the paper, we hope to include additional DinDinD models with alternative control groups.

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8 Figures and Tables

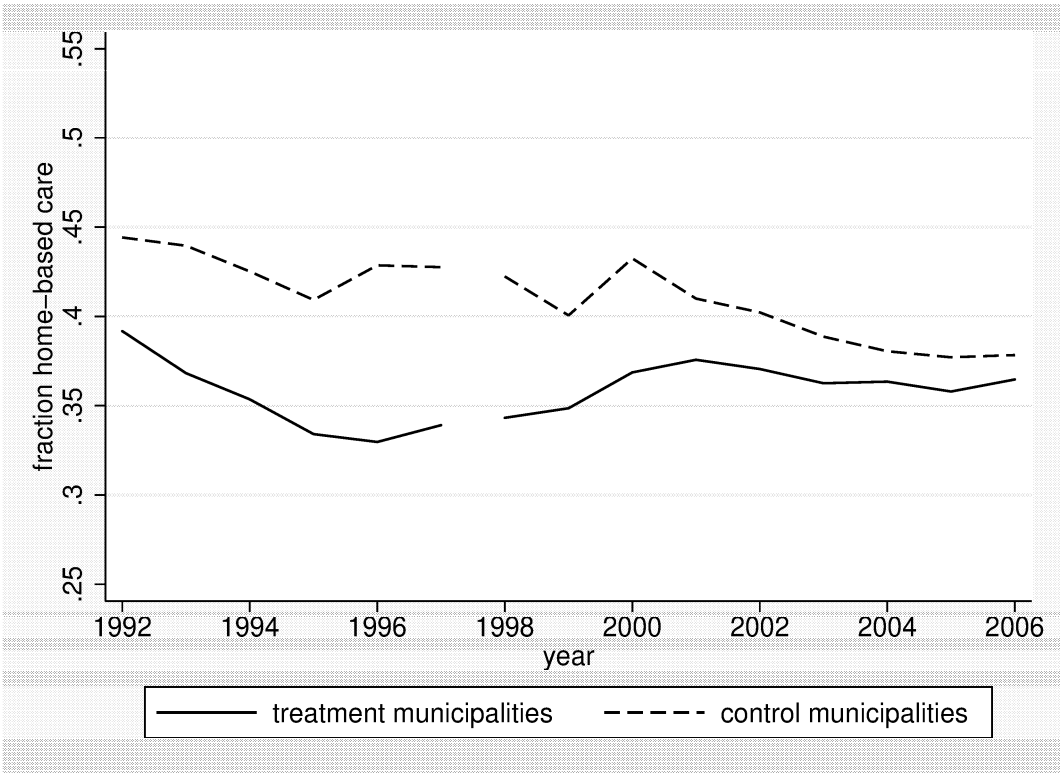

Figure 1. Home based care for the elderly (80+) aross time - treatment and control municipalities

Notes: The figure shows the development of the fraction of elderly (80+) using home based care from 1992-2006. The lines represent the means for treatment municipalities (having below median coverage in 1996 and 1997, pre-reform) and control municipalities (having above median coverage in 1996 and 1997, pre-reform.) and the reform of 1998 is marked by the break in the figure between 1997 and 1998.

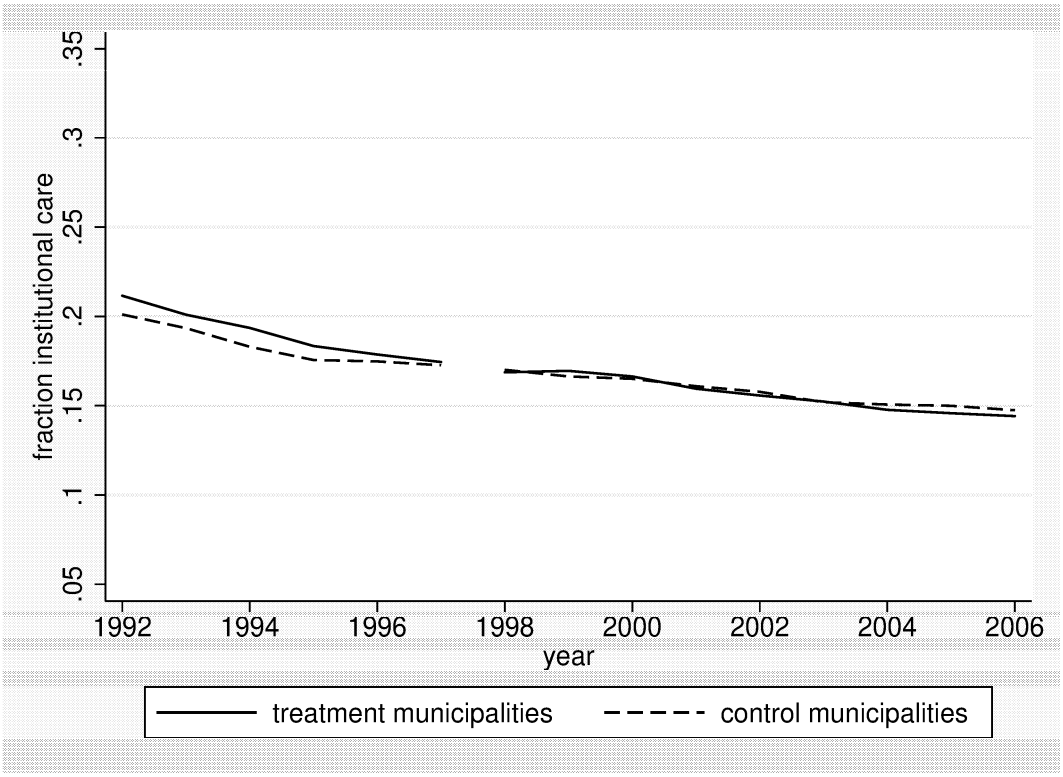

Figure 2. Institutional care care for the elderly (80+) aross time - treatment and control municipalities

Notes: The figure shows the development of the fraction of elderly (80+) using institutional care from 1992-2006. The lines represent the means for treatment municipalities (having below median coverage in 1996 and 1997, pre-reform) and control municipalities (having above median coverage in 1996 and 1997, pre-reform.) and the reform of 1998 is marked by the break in the figure between 1997 and 1998.

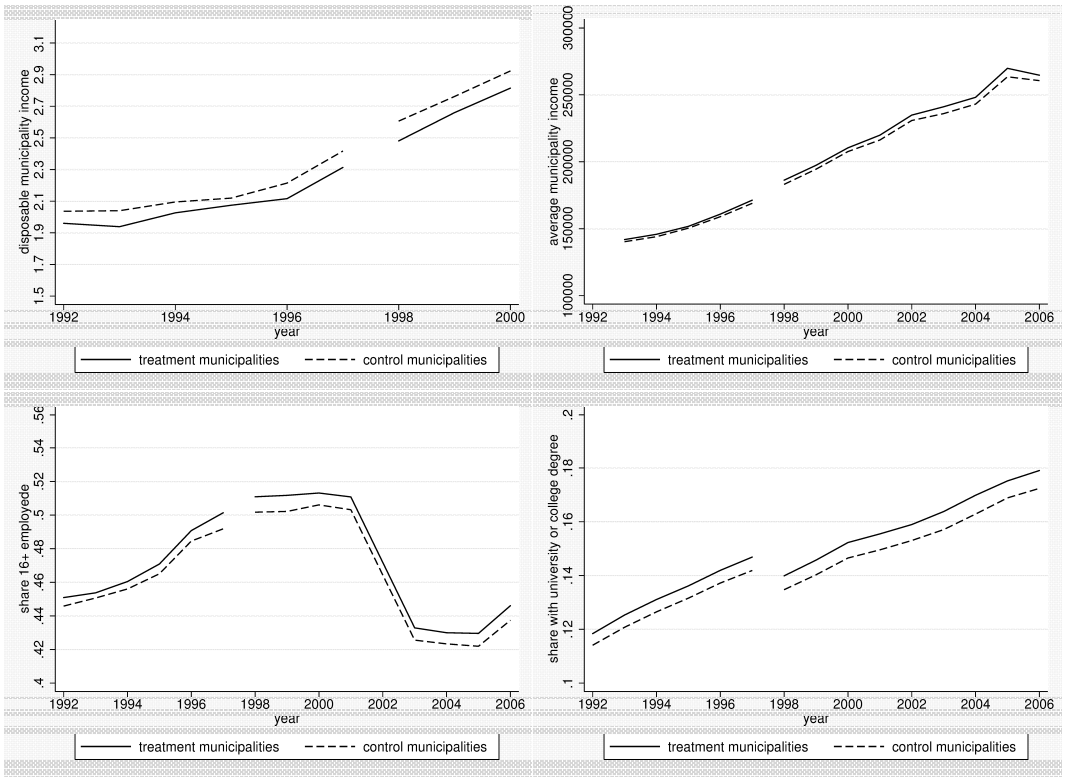

Figure 3. Municipality outcomes over time - treatment and control municipalities

Notes: Panel a shows the disposable municipality income from 1992-2000, panel b) the average income in the municipality, panel c) the share of 16 + employed and panel d) the share with a University or college degress. The lines represent the means for treatment municipalities (having below median coverage in 1996 and 1997, pre-reform) and control municipalities (having above median coverage in 1996 and 1997, pre-reform.) and the reform of 1998 is marked by the break in the figure between 1997 and 1998.

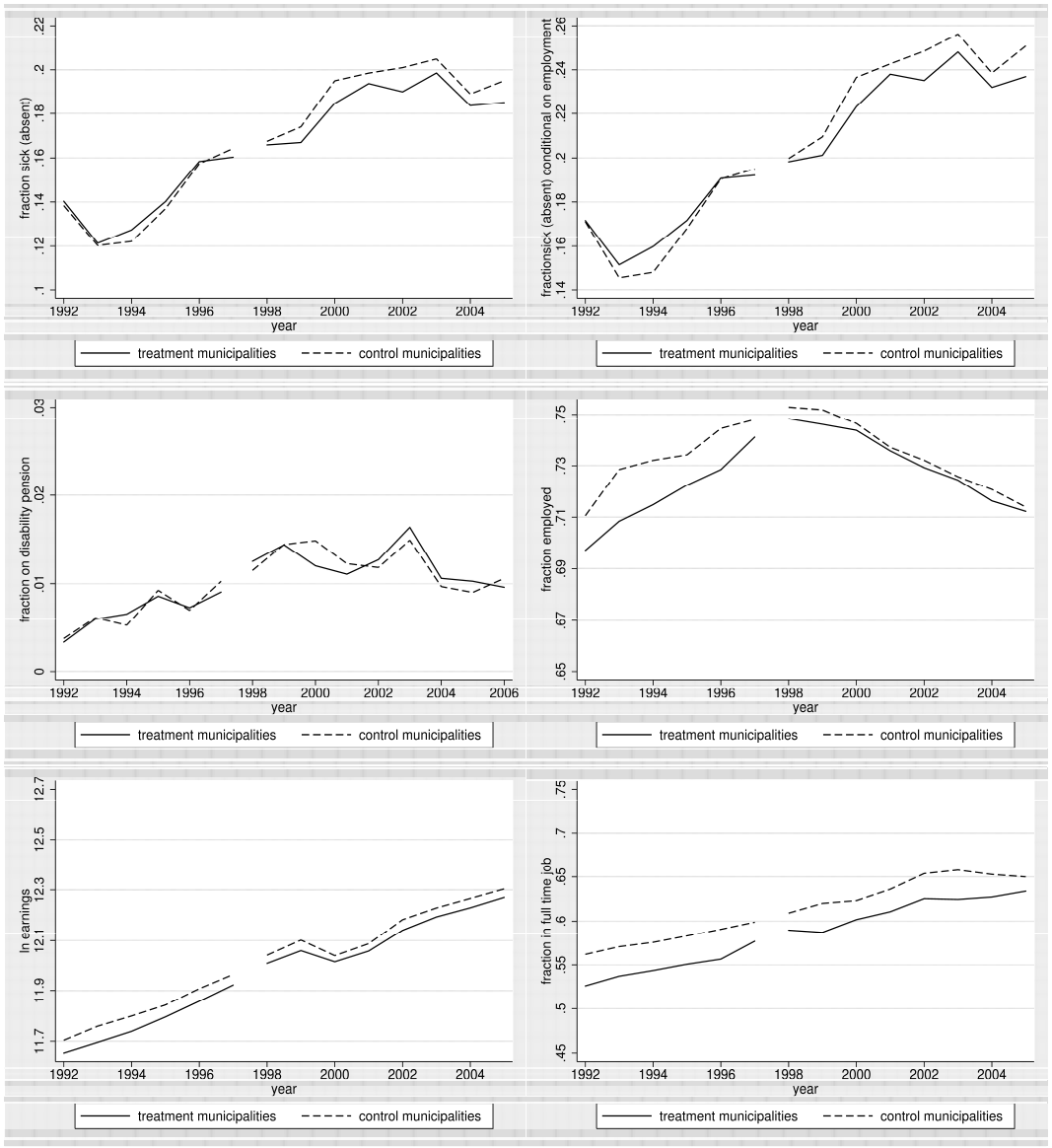

Figure 4. Outcomes for daughter over time - treatment and control municipalities

Notes: Panel a shows the development of sickness absence rates from 1992-2006, panel b) sickness absence rates conditional on employment, panel c) the development of influx to disability retirement, panel d) the probability of working in the labour market, panel e) ln earnings and panel f) probability of full time work. The lines represent the means for treatment municipalities (having below median coverage in 1996 and 1997, pre-reform) and control municipalities (having above median coverage in 1996 and 1997, pre-reform.) and the reform of 1998 is marked by the break in the figure between 1997 and 1998.

Growth in home based care coverage (1999/2000)/(1996/1997)	
Homebased care coverage before the reform (1996/1997)	-1.597***
	(.229)
Institution care coverage before the reform (1996/1997)	-.497***
	(.170)
Share of population >67 in 1997	1.312**
	(.532)
Share of population >80 in 1997	-3.089**
	(1.264)
Disposable income	.029**
	(.014)
Constant	1.627*
	(.094)
N (municipalities)	431

Table 1. Predictors of post-reform coverage growth
Notes: *p<0.10, **p<0.05, ***p<0.01. Standard errors clustered at municipality level

	Level	Differences	
	Treated	Treated - Control	
	Pre-reform	Pre-reform	Post-reform
Daughters	1992-1997	1992-1997	1998-2006
Sickness absence	.145	.001	-.006***
Sickness absence (cond. on work)	.177	.003	-.009***
Days absent	14.06	.476**	-.435**
Days absent (cond. on work)	16.37	.751**	-.484*
Disability Pension	.009	.001**	.000
Working	.723	-.013***	-.003**
Ln Earnings	11.81	-.051***	-.035***
Work Full Time	.553	-.031***	-.025***

Table 2. Descriptive statistics: main outcomes

	Daughters	N	Sons	N
	ITT		ITT	
Sickness absence	-.008***	638936	-.002	818655
	(.002)		(.002)	
Sickness absence	-.011***	408083	-.005**	520037
(cond. on work)	(.003)		(-.002)	
Days absent from	-.906**	638936	-.178	818655
work	(.385)		(.435)	
Days absent	-1.304***	408083	-.291	520037
(cond. on work)	(.487)		(.423)	
Disability Pension	.000	553002	.000	708532
	(.001)		(.000)	
Working	.008*	553002	.006*	708532
	(.004)		(.003)	
Ln Earnings	.009	506731	.005	676233
	(.008)		(.009)	
Working Full Time	.002	408083	.001	520037
	(.006)		(.002)	
Post reform coverage	.030***	506731	.030***	667304
80+	(.004)		(.005)	

Table 3. Main DinD model: Children with single parent aged 75+
Notes: *p<0.10, **p<0.05, ***p<0.01.

Daughters ITT	Drop three largest cities in Norway	N	Drop Rural Municipalities	N	Drop 10 % high/low coverage in 96/97	N
Sickness absence	-.007**	528018	-.008***	532351	-.007***	501326
	(.003)		(.003)		(.003)	
Sickness absence (cond. on work)	-.010***	335952	-.011***	341584	-.010***	319700
	(.004)		(.003)		(.003)	
Days absent from work	-.868**	528018	-.936**	532351	-.864*	501326
	(.408)		(.425)		(.444)	
Days absent (cond. on work)	-1.306**	335952	-1.284**	341584	-1.264**	319700
	(.543)		(.527)		(.559)	
Disability Pension	-.001	458205	-.000	460474	-.000	433709
	(.001)		(.001)		(.001)	
Working	.007**	458205	.012**	460474	.011***	433709
	(.005)		(.005)		(.004)	
Ln Earnings	.014*	419147	.011	421537	.014*	397042
	(.008)		(.009)		(.008)	
Work Full Time	-.000	335952	.001	341584	.009	319700
	(.005)		(.006)		(.006)	

Table 4. Robustness DinD models
Notes: *p<0.10, **p<0.05, ***p<0.01.

Daughters	M-D in same municipality	N	M-D not in same municipality	N	Daughters <50	N	Daughters 50+	N
Sickness absence	-.011***	416182	-.001	221358	-.010***	349367	-.004	206200
	(.004)		(.003)		(.003)		(.004)	
Sickness absence	-.017***	265361	-.000	142678	-.013***	266244	-.007	141839
(cond. on work)	(.004)		(.005)		(.004)		(.006)	
Days absent from	-1.195**	416182	-.361	221358	-1.059**	349367	-1.327*	206200
work	(.514)		(.507)		(.484)		(.813)	
Days absent	-1.823	265361	-.249	142678	-1.202**	266244	-2.352**	141839
(cond. on work)	(.631)		(.733)		(.573)		(1.008)	
Disability Pension	-.000	361035	-.001	190930	-.001	349367	.001	203635
	(.001)		(.001)		(.001)		(.002)	
Working	.010*	361035	.003	190930	.007	349367	.008	203635
	(.005)		(.005)		(.005)		(.008)	
Ln Earnings	.005	330266	.011	176203	.015**	328130	-.009	178601
	(.010)		(.010)		(.007)		(.013)	
Work Full Time	.002	265361	.009	142678	.005	266244	-.011	141839
	(.007)		(.007)		(.006)		(.009)	

Table 5. Sub-group DinD models

Notes: *p<0.10, **p<0.05, ***p<0.01.

Daughters	No siblings	N	One sibling		Two + siblings		First Born		Later Born	
Sickness absence	-.011**	112259	-.005	202120	-.009***	324557	-.009**	274341	-.007**	364595
	(.005)		(.004)		(.003)		(.003)		(.003)	
Sickness absence	-.015	72500	-.010*	131281	-.012***	204302	-.013***	173124	-.010***	234959
(cond. on work)	(.007)		(.005)		(.004)		(.005)		(.004)	
Days absent from	-.897	112259	-.777	202120	-1.034**	324557	-.992**	274341	-.876	364595
work	(.718)		(.607)		(.488)		(.500)		(.537)	
Days absent	-1.376	72500	-1.153	131281	-1.446**	204302	-1.657**	173124	-1.072	234959
(cond. on work)	(.951)		(.781)		(.692)		(.674)		(.669)	
Disability Pension	.002	99726	-.002**	175311	-.000	277965	-.000	239228	-.000	313774
	(.001)		(.001)		(.001)		(.001)		(.001)	
Working	.010	99726	.011*	175311	.005	277965	.012**	239228	.004	313774
	(.008)		(.006)		(.005)		(.006)		(.005)	
Ln Earnings	.004	90510	.003	161080	.012	255141	.007	216311	.008	290420
	(.016)		(.011)		(.011)		(.011)		(.009)	
Work Full Time	.001	72500	.006	131281	-.001	204302	-.002	173124	.006	234959
	(.012)		(.009)		(.006)		(.007)		(.007)	

Table 6. Sub-group DinD models

Notes: *p<0.10, **p<0.05, ***p<0.01.

	Daughters with parent aged 60-70	N
	ITT	
Sickness absence	.005	139265
	(.005)	
Sickness absence	.004	96191
(cond. on work)	(.007)	
Days absent from	-.246	139264
work	(.991)	
Days absent	-.586	96191
(cond. on work)	(1.392)	
Disability Pension	-.000	139264
	(.001)	
Working	.004	139264
	(.007)	
Ln Earnings	.001	129717
	(.013)	
Working Full Time	-.006	96191
	(.010)	

Table 7. Placebo DinD models:
Notes: *p<0.10, **p<0.05, ***p<0.01.

	Daughters	N
	ITT	
Sickness absence	-.013**	692266
	(.006)	
Sickness absence (cond. on work)	-.017**	504274
	(.008)	
Days absent from work	-.937	692266
	(.993)	
Days absent (cond. on work)	-.997	504274
	(1.32)	
Disability Pension	-.000	692266
	(.001)	
Working	.006	692266
	(.008)	
Ln Earnings	.010	636448
	(.014)	
Working Full Time	.008	504274
	(.011)	

Table 8. Preliminary DinDinD models: Parents 75+ vs. 60-70
Notes: *p<0.10, **p<0.05, ***p<0.01.

Appendix Table

	Treatment		Control	
	Average	SD	Average	SD
Population	9477	(16146)	10723	(37450)
Share of population 67+	0.159	(0.035)	0.158	(0.039)
Share of poulation 80+	0.049	(0.015)	0.048	(0.016)
Share of 67+ emigrated	0.006	(0.004)	0.007	(0.004)
Share of 67+ immigrated	0.005	(0.003)	0.005	(0.003)
Share of population married	0.396	(0.028)	0.378	(0.038)
Share of poulation divorced	0.067	(0.018)	0.075	(0.023)
Share of population widowed	0.065	(0.014)	0.065	(0.014)
Education 9 years - males	0.279	(0.080)	0.269	(0.076)
- females	0.362	(0.078)	0.350	(0.074)
Education 12 years - males	0.493	(0.039)	0.481	(0.049)
- females	0.431	(0.027)	0.419	(0.038)
Education > 12 years - males	0.203	(0.086)	0.216	(0.080)
- females	0.183	(0.067)	0.198	(0.066)
Employment rate (share of population 16+ in work)	0.534	(0.051)	0.535	(0.516)
Average income NOK	187978.3	(28526.97)	190963.7	(26452.85)
Unsrestricted budget..? per capita (10 000 NOK)	1.944	(0.426)	2.268	(0.693)
Sentrality index	5.307	(2.177)	5.489	(2.134)
Share of population in densely populated areas	0.702	(0.263)	0.751	(0.269)
Coverage rate institutions for 80+	0.174	(0.045)	0.173	(0.050)
Coverage rate home based for 80+	0.339	(0.041)	0.428	(0.061)
Share of registered voters that participated in elections 1995	0.622	(0.047)	0.630	(0.057)
Socialist vote share 1995	0.248	(0.108)	0.381	(0.101)
Socialist mayor from 1996	0.286	(0.452)	0.318	(0.466)
Female mayor from 1996	0.153	(0.360)	0.130	(0.336)

Table A1. Descriptive statistics for treatment and control municipalities in 1997