

Home vs. Nursing Care: Unpacking the Impact on Health and Well-Being

E. Bassoli¹, M.Lefebvre² and J. Schoenmaeckers³

¹ETH Zurich; ²University of Strasbourg, BETA, CNRS; ³HEC-Liege

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Introduction

- The **population ageing** poses significant challenges to the sustainability of long term care systems
- In many countries, governments have intervened by fostering home care assistance which reduces public costs compared to nursing homes spending
- Furthermore, **COVID-19** pandemic has raised the question of the quality of **nursing homes** due to the higher mortality faced by institutionalized individuals
 - ▶ About 66% of total COVID-related death in Spain, 48% in France, 34% in Germany and only 15% in the Netherlands, 50% in Belgium (CIHI, 2020)
- **Low quality** of care and **physical proximity** of residents have been pointed out

Introduction

- This is a problem if nursing homes lead to **lower well-being due to their very own characteristics**
 - ▶ If the cause is the **structure and organization** of nursing homes, there is room for reform
- This is also important regarding the **long-term care policies**
 - ▶ How it is **organized** (NPO, FP, Public), **delivered** (home or institutional), **financed** (OOP, in kind, ...), resources **generated** (general taxation, mandatory social security and/or voluntary private insurance)
 - ▶ The role of **informal care** and **motives** of this support (Klimaviciute et al., 2017; Lefebvre et al., 2025)
 - ▶ The **type of care** and the substitutability between formal and informal care (Van Houtven and Norton, 2004; Bonsang, 2009)

Literature

- However, the literature that compares nursing home vs. home care assistance is scarce and the results are mixed.
- Many studies have investigated the choice of **housing at old age** (Lindrooth et al, 1993; Laferrere et al, 2013; Angelini and Laferrere, 2012, Schmitz and Stroka-Welsch, 2020, Laferrere and Arnault, 2021)
 - ▶ They point **prices, ADL, partnership, education, assets and quality** as determinants of choice of nursing homes
- Studies have also tried to identify factors of **mortality in the nursing homes** (Lin, 2014; Sung, 2014; Levy et al., 2015; Falcone et al., 2018; Braggion et al., 2020; Antwi and Bowblis, 2018; Giudici et al., 2019; Bakx et al., 2020; Cronin and Evans, 2020)
 - ▶ They show the role of **co-morbidity and limitations** but also the **quality** of the nursing homes
 - ▶ **Lack of causal evidence**

Literature

- Evidence about differences in well-being at home and in institutional facilities is also mixed.
 - ▶ Some studies found that well-being increases after the admission into NH (Böckerman et al. 2012, Bom et al. 2022, Laferrère & Schoenmaeckers 2025).
 - ▶ But other studies found a strong association between loneliness and institutionalization (Prieto-Flores et al. 2011) or admission may also be perceived as a stressful event and a reduction in contact with friends and family members (Port et al. 2001, Verbeek et al. 2020).
 - ▶ Also nursing home admission has been shown to be associated with a reduction in hospital admissions and healthcare spending (Bakx et al. 2020).
 - ▶ But staff turnover may lower quality and increase mortality (Comondore et al. 2009, Antwi & Bowblis 2018, Lin 2014)

This paper in a nutshell

- In this paper, we **compare older individuals living at home and in institutions**, and look at differences in health and well-being outcomes by exploiting an administrative survey in France.
 - ① We apply the **propensity score matching method** to compare individuals with similar characteristics but living in different arrangements
 - ② We look at both **objective and subjective health and well-being measures**
 - ③ Furthermore, we explore heterogeneity based on **the ownership status of nursing homes**

Our results

Our results are of three kinds

① Mortality and health outcomes:

- ▶ We find difference in mortality and health outcomes between "at home" and nursing home
- ▶ Individuals in **nursing home have better health outcomes** compared to those at home (lower mortality, less hospital nights, better SAH)

② Well-being outcomes:

- ▶ But individuals in **nursing home tend to be less happy, and to experience lack of calm and more nervousness.**

③ Private vs Public NH:

- ▶ We also find that health outcomes in **public nursing home are better than in private ones**

Data

- We use the Survey “Capacite, Aide et REssources des seniors” (CARE)
 - ▶ It is a general population survey of French individuals aged 60+. It targets living conditions of individuals living at home and in communities (residential facilities).
 - ▶ It was conducted in 2015-2016 by the French Ministry of Health.
 - ▶ The survey includes information on socio-economic characteristics, health status and help received. It also asks questions about the general well-being of the respondent.
- Combined with administrative data about the death of the respondents up to 2021

The sample and summary statistics

- Our sample includes about 10000 individuals at home and in nursing homes

Table: Summary statistics of CARE data

	At home	Nursing Home	Both
Age	75.6	86.4	78.7
GIR score	5.1	2.8	4.4
% of female	61.5	74.7	65.3
Disposable Income (€)	27179.5	18917.9	24793.7
% in couple	48.4	12.5	38.1
# of helpers	0.672	0.940	0.749
# of chronic diseases	0.773	0.695	0.750
<i>Outcomes</i>			
# months not in life	9.091	20.443	12.217
# of hospital nights	0.269	0.302	0.278
% Fell	32.4	43.6	35.6
% in poor health	30.8	36.5	32.4
% Unhappy	52.0	62.1	55.1
% Sad	40.5	54.3	43.3
% Not relaxed	47.6	71.6	54.9
% Nervous	17.6	53.0	28.3

Data

- Important **variations** in the outcomes between at home and in nursing homes
- People in nursing homes may differ from people staying at home
 - ▶ in terms of health, well-being but also age, marital status, wealth, etc..
- Important not comparing **apples and pears** by simply controlling for the level of dependence in OLS estimations $\Rightarrow \beta$ of **NH** (main variable of interest) changes.
- Need to control for the possible **simultaneous determination of health and housing**

Propensity score matching

- To control for the selection bias due to observables, we use a propensity score matching estimation method
 - ▶ Treatment group: individuals in a nursing home
 - ▶ Control group: individuals at home
- Individual in a nursing home is matched to individuals living at home with similar observable characteristics
 - ▶ It allows us to condition on sufficient observable information to obtain a counterfactual
 - ▶ The differences in outcomes of these matched pairs can then be attributed to the treatment (being in a nursing home)

Propensity score matching

- Conditional independence assumption (CIA)
 - ▶ The mortality of the individuals in the control group and in the treated group are independent of the residence status once we control for a set of observable characteristics
- This is done through the preliminary test of being into a nursing home obtained from a Probit regression [click here](#)
 - ▶ Balancing variables : gender, age, partnership status, income, GIR (similar to number of ADLs), chronic diseases and number of helpers (children, friends, relatives)
- We match observations using Kernell matching methods with replacement
 - ▶ Results are robust to using the nearest neighbor matching method without replacement and radius and stratification matching

Results

Table: Average Treatment Effects of the Treated (ATT)

Dep. Variable	No exact match	Exact match on sex	Exact match on sex & GIR	Exact match on sex, GIR & age
Time not in life months				
ATT	-5.994*** (1.025)	-6.190*** (1.004)	-6.014*** (0.987)	-4.887*** (0.951)
Treated	2757	2743	2689	2509
Control	6955	7078	7264	4995
Obs	9712	9821	9953	7504
Hospital Nights				
ATT	-0.0928*** (0.0207)	-0.0772*** (0.0212)	-0.0700*** (0.0212)	-0.0807*** (0.0203)
Treated	2899	2889	2858	2637
Control	6742	6995	7219	5022
Obs	9641	9884	10077	7659
Fell				
ATT	-0.116*** (0.0214)	-0.109*** (0.0217)	-0.119*** (0.0219)	-0.104*** (0.0206)
Treated	2917	2892	2848	2617
Control	6884	7079	7208	5043
Obs	9801	9971	10056	7660
Poor health				
ATT	-0.152*** (0.0219)	-0.153*** (0.0219)	-0.163*** (0.0222)	-0.188*** (0.0206)
Treated	2934	2924	2880	2667
Control	6843	7032	7199	5046
Obs	9777	9956	10079	7713

Results

Table: Average Treatment Effects of the Treated (ATT)

Dep. Variable	No exact match	Exact match on sex	Exact match on sex & GIR	Exact match on sex, GIR & age
No happiness				
ATT	0.309*** (0.0268)	0.315*** (0.0258)	0.317*** (0.0275)	0.261*** (0.0236)
Treated	2931	2876	2879	2280
Control	6841	7006	6802	4485
Obs	9772	9882	9681	6765
Sadness				
ATT	0.0106 (0.0248)	-0.00510 (0.0249)	-0.0103 (0.0267)	-0.0242 (0.0226)
Treated	1672	1663	1670	1516
Control	6972	7116	6846	4497
Obs	8644	8779	8516	6013
No calm				
ATT	0.310*** (0.0307)	0.323*** (0.0304)	0.314*** (0.0336)	0.291*** (0.0243)
Treated	2921	2895	2879	2290
Control	6976	7095	6892	4565
Obs	9897	9990	9771	6855
Nervousness				
ATT	0.308*** (0.0269)	0.291*** (0.0349)	0.258*** (0.0454)	0.263*** (0.0232)
Treated	2942	2889	2880	2293
Control	702	7131	6927	4581
Obs	3644	10020	9807	6874

Sensitivity analysis

- We test if our **ATT** are robust to deviation from the **CIA** using simulated sensitivity analysis as proposed by **Ichino et al (2008)**
- Assume that the **CIA is not satisfied** given the considered observables but would be if one could observe an additional binary variable
 - ▶ The **potential confounder can be simulated and added to the covariates**
 - ▶ By comparing the results obtained with and without, we show to what extent the baseline results are **robust to specific sources of failure of the CIA**
 - ▶ These variables are known to be strongly associated with both the likelihood of being in a NH/receiving long-term care and with key health and well-being outcomes.
 - ★ For instance, **older individuals and those without a partner** are more likely to rely on formal care, while gender differences often influence care expectations and access.
 - ★ By choosing covariates that plausibly capture latent vulnerabilities or social dynamics that are difficult to observe directly, the simulation aims to **mimic the types of omitted variable bias** that could threaten causal inference.

Sensitivity analysis

- The **assumption** is that the **CIA** only holds given **X** and an **unobserved binary variable U**
- U may impact both the **treatment and the outcome**
- One can measure the effect of U on the relative probability to have a positive outcome in the absence of treatment
 - ▶ Γ is a measure of the outcome effect
- One can measure the effect of U on the relative probability to be assigned to the treatment
 - ▶ Λ is a measure of the selection effect
- We use **this approach** to pick the parameters of the **distribution of U**
 - ▶ Make it similar to the empirical distribution of important **binary covariates**

Sensitivity Analysis

Table: Sensitivity analysis with confounder-like

Outcomes		Outcome Effect Γ	Selection Effect Λ	ATT
Months not in life	PSM (Kernell)	1	1	-5.994***
	<i>Confounder-like</i>			
	Being a female	0.790	1.972	-5.055***
	Being in couple	0.526	0.178	-6.789***
	Be aged 80 and over	5.069	5.187	-9.192***
Poor health	PSM (Kernell)	1	1	-0.152***
	<i>Confounder-like</i>			
	Being a female	1.094	1.861	-0.144***
	Being in couple	0.784	0.156	-0.158***
	Be aged 80 and over	1.491	7.660	-0.172***
Unhappy	PSM (Kernell)	1	1	0.309***
	<i>Confounder-like</i>			
	Being a female	0.670	1.792	0.311***
	Being in couple	2.188	0.168	0.350***
	Be aged 80 and over	0.603	8.103	0.347***

Falsification

- In addition: a **falsification population test**.
- We take the sample of people **living at home** and we **randomly** split the sample in one **control** and one **fakely treated**, respecting the proportions of treated and controls in the main analysis.
- We repeat it **100** times, and we run our estimation model.
- We can see the **size of the effect** and in how many cases we find statistically significant differences.
- We should **not** find any differences in the outcomes of the two samples in this falsification population exercise if the only reason for the differences is the residential status.

Results differ significantly from the simulated results, except for the variable *Sad*. These findings support also that there is no confounding factors that affect our estimates.

Falsification

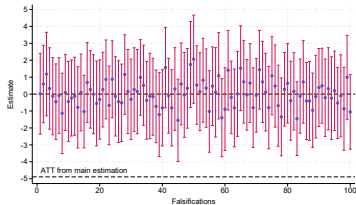


Figure: Time not in life

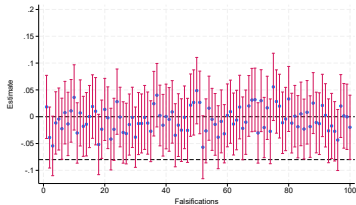


Figure: Hospital night

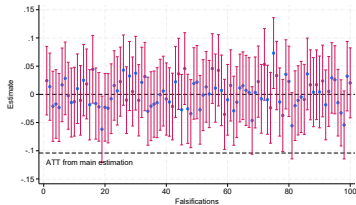


Figure: Fell

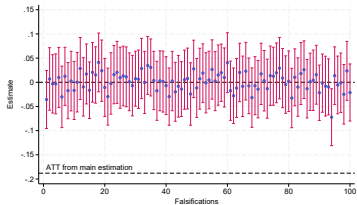


Figure: Poor health

Falsification

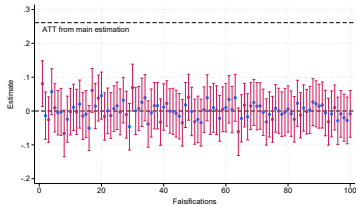


Figure: No happiness

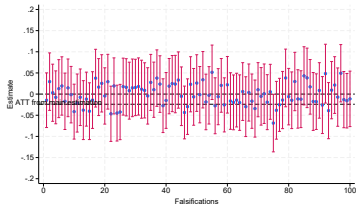


Figure: Sadness

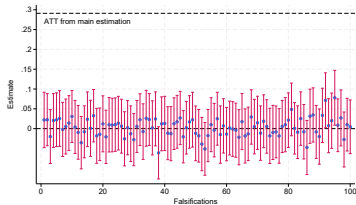


Figure: Nervousness

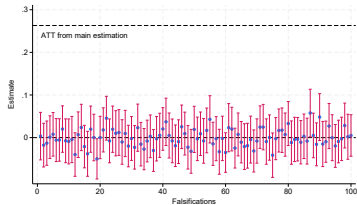


Figure: No calm

Heterogeneity

We proceed with the following analyses:

- **Heterogeneity:** Sex, GIR, Age [click here](#)
- **Heterogeneity:**At home vs NH type [click here](#)
- **Heterogeneity:**Public vs Private NH [click here](#)

Conclusion

- This paper investigates health outcomes and well-being between individuals residing at home vs in institutionalized care
 - ① We provide **causal evidence** using a propensity score matching to ensure an appropriate group comparison
 - ② We show that individuals in NH have **lower mortality and also smaller risk of hospitalization, fell and poor health reported**
 - ③ However, evidence show that institutionalized individuals have **lower well-being**
 - ④ We document further heterogeneity by type of NH and find that **public NH show the best health outcomes** vs others
- Our results suggests that NH represent an important setting for long term care provision, which might even be preferred than care at home, when similar characteristics are accounted.

Probit analysis: Probability of entering into a nursing home

	Nursing home	Private profit NH	Private not profit NH	Public hospital NH	Public no hospital NH	Private NH NH	Public NH	Not profit NH
Covariates								
Health characteristics								
GIR >= 5	-0.315*** (0.006)	-0.101*** (0.007)	-0.106*** (0.006)	-0.129*** (0.007)	-0.089*** (0.006)	-0.187*** (0.007)	-0.198*** (0.007)	-0.266*** (0.007)
Chronic disease	-0.109*** (0.008)	-0.022*** (0.005)	-0.040*** (0.006)	-0.017*** (0.006)	-0.020*** (0.005)	-0.063*** (0.007)	-0.037*** (0.007)	-0.081*** (0.007)
Socio-economic characteristics								
Age	0.009*** (0.000)	0.003*** (0.000)	0.004*** (0.000)	0.002*** (0.000)	0.003*** (0.000)	0.006*** (0.000)	0.005*** (0.000)	0.008*** (0.000)
Woman	-0.026*** (0.007)	0.005 (0.005)	0.005 (0.006)	-0.024*** (0.006)	-0.019*** (0.005)	0.010 (0.007)	-0.040*** (0.007)	-0.032*** (0.000)
Percentiles of income	-0.001*** (0.000)	0.001*** (0.000)	-0.000 (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	0.001*** (0.000)	-0.001*** (0.000)	-0.002*** (0.000)
Family characteristics								
In couple	-0.121*** (0.009)	-0.049*** (0.006)	-0.057*** (0.008)	-0.029*** (0.007)	-0.018** (0.007)	-0.102*** (0.009)	-0.042*** (0.009)	-0.083*** (0.010)
# caregivers	-0.024*** (0.003)	-0.005** (0.002)	-0.011*** (0.002)	-0.006*** (0.002)	-0.002 (0.002)	-0.016*** (0.003)	-0.008** (0.003)	-0.019*** (0.003)
Pseudo-R ²	0.39	0.22	0.18	0.18	0.17	0.25	0.24	0.32
Obs	10784	10784	10784	10784	10784	10784	10784	10784

Empirical Strategy

Heterogeneous effect by Age, Female and GIR

	(I)	(II)	(III)	(IV)	(V)	(VI)
Dep Variable	age \leq 80	age $>$ 80	male	female	gir $<$ 5	gir \geq 5
Time not in life months						
ATT	-0.151 (2.116)	-7.352*** (1.155)	-7.235*** (1.648)	-5.395*** (1.240)	-6.274*** (1.054)	-2.401* (1.236)
Treated	534	2196	692	2085	2406	287
Control	5118	2434	2996	4369	2006	5434
Obs	5652	4630	3688	6454	4412	5721
Hospital night						
ATT	-0.144*** (0.0444)	-0.0684*** (0.0240)	-0.136*** (0.0372)	-0.0823*** (0.0266)	-0.108*** (0.0238)	0.0246 (0.0309)
Treated	566	2314	729	2202	2583	304
Control	5115	2342	2993	4215	2002	5441
Obs	5681	4656	3722	6417	4585	5745
Fell						
ATT	-0.0953** (0.0457)	-0.112*** (0.0250)	-0.123*** (0.0369)	-0.114*** (0.0271)	-0.120*** (0.0237)	0.00557 (0.0349)
Treated	568	2348	743	2212	2583	305
Control	5114	2419	2994	4185	1982	5441
Obs	5682	4767	3737	6397	4565	5746
Poor health						
ATT	-0.288*** (0.0427)	-0.115*** (0.0252)	-0.203*** (0.0370)	-0.121*** (0.0272)	-0.172*** (0.0239)	0.0123 (0.0265)
Treated	571	2379	749	2232	2591	305
Control	5118	2420	2996	4158	1986	5440
Obs	5689	4799	3745	6390	4577	5745

Heterogeneous effect by Age, Female and GIR

	(I)	(II)	(III)	(IV)	(V)	(VI)
Dep Variable	age \leq 80	age $>$ 80	male	female	gir $<$ 5	gir \geq 5
No happiness						
ATT	0.268*** (0.0637)	0.299*** (0.0320)	0.245*** (0.0473)	0.321*** (0.0305)	0.343*** (0.0322)	-0.0504 (0.0360)
Treated	587	2297	740	2128	2606	300
Control	4877	2225	2764	4351	1570	5247
Obs	5464	4522	3504	6479	4176	5547
Sadness						
ATT	-0.00196 (0.0526)	0.00845 (0.0284)	0.0440 (0.0419)	-0.0152 (0.0315)	-0.00835 (0.0305)	0.0618 (0.0385)
Treated	335	1328	456	1209	1409	281
Control	4937	2222	2810	4117	1698	5282
Obs	5272	3550	3266	5326	3107	5563
No calm						
ATT	0.439*** (0.0426)	0.286*** (0.0337)	0.229*** (0.0433)	0.341*** (0.0354)	0.352*** (0.0333)	0.0381 (0.0355)
Treated	587	2289	747	2125	2614	300
Control	4920	2272	2804	4398	1616	5309
Obs	5507	4561	3551	6523	4230	5609
Nervousness						
ATT	0.275*** (0.0560)	0.294*** (0.0349)	0.342*** (0.0310)	0.287*** (0.0383)	0.308*** (0.0336)	0.107*** (0.0271)
Treated	586	2298	744	2119	2605	297
Control	4942	2287	2816	4420	1626	5310
Obs	5528	4585	3560	6539	4231	5607

AH vs NH type

Dep Var	Private profit	Private not profit	Public hospital	Public no hospital	Private	not for profit
Time not in life months						
ATT	-6.838*** (1.402)	-5.869*** (1.156)	-5.341*** (1.221)	-5.763*** (1.217)	-6.880*** (1.126)	-6.179*** (0.981)
Hospital Nights						
ATT	-0.015 (0.030)	-0.076*** (0.023)	-0.143*** (0.026)	-0.054** (0.026)	-0.054** (0.022)	-0.101*** (0.021)
Fell						
ATT	-0.010 (0.031)	-0.103*** (0.025)	-0.157*** (0.027)	-0.117*** (0.026)	-0.071*** (0.024)	-0.138*** (0.021)
Poor Health						
ATT	-0.132*** (0.031)	-0.165*** (0.024)	-0.174*** (0.027)	-0.132*** (0.026)	-0.150*** (0.024)	-0.169*** (0.021)
Observations	8,292	8,576	8,499	8,432	9,138	10,047

Robustness and Sensitivity

AH vs NH type

Dep Var	Private profit	Private not profit	Public hospital	Public no hospital	Private not for profit	
Unhappy						
ATT	0.302*** (0.033)	0.280*** (0.029)	0.280*** (0.037)	0.341*** (0.030)	0.270*** (0.030)	0.305*** (0.026)
Sad						
ATT	0.017 (0.039)	0.034 (0.030)	0.016 (0.034)	-0.0035 (0.033)	0.014 (0.027)	0.009 (0.024)
Not relaxed						
ATT	0.282*** (0.036)	0.286*** (0.030)	0.302*** (0.037)	0.296*** (0.031)	0.258*** (0.030)	0.298*** (0.029)
Nervous						
ATT	0.329*** (0.033)	0.263*** (0.026)	0.305*** (0.035)	0.316*** (0.028)	0.287*** (0.027)	0.282*** (0.028)
Observations	7,839	8,145	8,056	7,982	8,746	9,707

Robustness and Sensitivity

Public vs Private NH

Dep Var	Private profit	Private not profit	Public hospital	Public no hospital	Private/ public	not for profit vs for profit
Time not in life (months)						
ATT	0.918 (0.981)	-0.968 (0.862)	-0.181 (0.890)	-0.161 (0.927)	0.634 (0.763)	0.219 (1.068)
Obs	2,879	2,879	2,879	2,879	2,879	2,879
Hospital night						
ATT	0.0704*** (0.0256)	-0.0128 (0.0206)	-0.0641*** (0.0212)	0.0245 (0.0229)	0.0332* (0.0194)	-0.0890*** (0.0275)
Obs	3,034	3,034	3,034	3,034	3,034	3,034
Fell						
ATT	0.0906*** (0.0259)	0.0102 (0.0225)	-0.0631*** (0.0234)	0.00195 (0.0243)	0.0508** (0.0210)	-0.0928*** (0.0288)
Obs	3,037	3,037	3,037	3,037	3,037	3,037
Poor health						
ATT	0.0510** (0.0247)	-0.0486** (0.0213)	0.00876 (0.0231)	0.0204 (0.0238)	-0.0109 (0.0196)	-0.0122 (0.0272)
Obs	3,070	3,070	3,070	3,070	3,070	3,070

Robustness and Sensitivity

Public vs Private NH

Dep Var	Private profit	Private not profit	Public hospital	Public no hospital	Private/ public	not for profit vs for profit
No happiness						
ATT	0.00909 (0.0255)	0.0277 (0.0222)	-0.0298 (0.0232)	0.0618*** (0.0238)	0.000643 (0.0203)	0.0354 (0.0286)
Obs	3,070	3,070	3,070	3,070	3,070	3,070
Sadness						
ATT	0.0541 (0.0351)	0.0141 (0.0297)	-0.0119 (0.0329)	-0.047 (0.0324)	0.0156 (0.0272)	-0.0306 (0.0399)
Obs	1,773	1,773	1,773	1,773	1,773	1,773
No calm						
ATT	0.0077 (0.0239)	0.0148 (0.0208)	0.0121 (0.0215)	-0.00649 (0.0221)	0.00361 (0.0193)	0.0471* (0.0277)
Obs	3,070	3,070	3,070	3,070	3,070	3,070
Nervousness						
ATT	0.0492* (0.0256)	-0.0208 (0.0226)	-0.00792 (0.0236)	0.0151 (0.0248)	-0.00629 (0.0206)	-0.0508* (0.0286)
Obs	3,070	3,070	3,070	3,070	3,070	3,070

Robustness and Sensitivity

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