

# Gender effect in long-term care: Evidence from China

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# Outline

- 1 Introduction
- 2 LTC in China
- 3 Data
- 4 Empirical strategy
- 5 Results

# Introduction

- Population aging → growing needs for long-term care (LTC), especially for older women.
- Most informal caregivers are female.
- Observed benefits of gender matches in health care and education settings:
  - ▶ Physician-patient gender match → better patient outcomes and experiences in health care settings (Franks and Bertakis, 2003; Bertakis et al., 2009; Malhotra et al., 2017).
    - ★ The benefits of the physician-patient gender match are typically stronger for female pairs than male pairs.
  - ▶ Positive impact of having a gender-matched female instructor is persistent (Lim and Meer, 2020).

# Introduction

- Limited studies examining:
  - ▶ Association between caregiver gender and the quality of care provided,
  - ▶ Interaction of parent-child gender pairs.
- The role of same gender effect remains unclear in formal LTC (Chan et al., 2006),
- Has not been explored in the context of informal LTC.
- This paper:
  - ▶ Investigates the impact of the gender match effect on health and long-term care outcomes at older ages.
  - ▶ With a focus on informal LTC.

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# LTC in China

- Rapid population aging in China → widening shortage in LTC services.
  - ▶ Population aged 60 and 60+: 12.4% → 28% by 2040.
  - ▶ 35% growth in disabled elderly from 2015 to 2030.
- China's LTC is dominated by informal care:
  - ▶ Provided by family members, supplemented by institutional care provided by the public and private sectors (Wang et al., 2020; Lu et al., 2015; Fu, 2017).
  - ▶ Li and Otani (2018):
    - ★ 6% of the disabled elder people in China can access and afford formal care.
- Lei et al., 2016:
  - ▶ 60% of disabled people (65+) consider the help they receive as moderately met or did not meet their needs.
- Urban-rural disparities: LTC needs for the elderly with a rural hukou are more vigorous.

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# Chinese Longitudinal Healthy Longevity Survey (CLHLS)

- Has a special focus on the oldest-old (aged 80 years and over);
- Has the largest sample of centenarians internationally (Koenig, 2001).
- Collects a multitude of characteristics and conditions of the respondents aged 65 and over.
- 2018 wave: 2,826 respondents for our analysis.
- Sample selection:
  - ▶ 65+;
  - ▶ currently experience difficulty with at least one ADL task and report to receive primary care from spouses, children or spouses of children for such activities;
  - ▶ without missing household member and explanatory variables information.



# Dependent Variables

- Self-reported life quality and health:
- ADL score: bathing, dressing, toileting, indoor movement, urination control, and eating
- Self-reported unmet needs:
- Depression score: 10 questions based on CES-D scale

# Descriptive Statistics

Table 1: Summary statistics

	All	By gender concordance		By primary caregiver		
		Same gender	Opposite gender	Spouse	Daughter Daughter-in-law	Son Son-in-law
<i>Outcome variables</i>						
Satisfied with health condition	0.39	0.42	0.37	0.35	0.42	0.39
Satisfied with Quality of life	0.71	0.74	0.68	0.65	0.74	0.70
Reports unmet needs	0.49	0.45	0.53	0.52	0.45	0.53
ADL score (mean)	9.92	10.44	9.44	7.94	10.74	9.99
Depression CES-D Score(mean)	14.82	14.49	15.09	14.28	14.71	15.25
Observations	2826	1338	1488	518	1142	1166

*Notes:* *gender concordance* indicates whether care recipient and primary caregiver have the same gender or opposite gender. Authors' calculation based on the analytical sample in CLHLS 2018. All variables are defined in Appendix A

# Independent Variables

- Gender concordance between the primary caregiver and the care recipient:
  - ▶ CLHLS enables the identification of a single primary caregiver:
    - ★ spouse, son, daughter-in-law, daughter, son-in-law.
  - ▶ A dummy variable in the form of “X-Y”:
    - ★ X indicates the gender of the care recipient;
    - ★ Y indicates the gender of the primary caregiver;
    - ★ “F-F” represents a disabled female elder that primarily receives LTC from another female.
  - ▶ **concordance**: a dummy indicator:
    - ★ 1: care recipient and primary caregiver share the same gender: “F-F” and “M-M” combined.
  - ▶ 47% of our estimation sample is gender concordant pairs, in which 69% is “F-F” pairs.

# Additional Independent Variables

- Andersen's Behavioural Model (Andersen, 1995):
  - ▶ widely used in the study of older people's use of health services;
  - ▶ adopted in the study of LTC (Fu et al., 2017; Carvalho et al., 2019; Zhang et al., 2020).
- Includes several variables that can be categorized into three groups:
  - ▶ *Predisposing characteristics*: age, marital status, residence area, years of education, ethnicity,
  - ▶ *Enabling factors*: pension, health insurance, financial status, primary source of financial support, primary occupation before age 60,
  - ▶ *Need factors*: number of chronic disease.

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## Empirical strategy: Instrumental variables strategy

- Instrument variables for *concordance* indicator: female ratio in the household and the square of female ratio in the household.
- Our IV approach estimates,

$$H_i = \alpha + \beta GC_i + \beta_1 \mathbf{X}_i + \epsilon_i$$

- $H_i$  is the outcome variable measuring health of the disabled elderly  $i$ .
- $GC_i$  is the instrumented indicator for gender concordance between the disabled elderly and the primary caregivers.
- $\mathbf{X}_i$  is a list of explanatory variables.
- Let  $\mathbf{Z}_i$  denotes the two instrumental variables. We estimate the model using a two-stage least squares (2SLS) under the assumptions that  $corr(GC_i, \mathbf{Z}_i) \neq 0$  and  $E(\epsilon_i | \mathbf{Z}_i) = 0$ .

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# Results

Table 2: The effect of gender concordance.

	(1) Self-rated health	(2) Quality of life	(3) Unmet LTC need	(4) ADL	(5) Depression score
OLS/Logistic Coeff.	0.008 (0.021)	0.012 (0.019)	-0.072*** (0.016)	0.287** (0.120)	-0.678* (0.359)
2SLS Coeff.	0.327** (0.141)	-0.009 (0.154)	-0.217** (0.105)	0.790 (0.849)	-0.966 (2.469)
KP F	50.81	54.52	50.19	51.68	41.37
Sample Size	2253	2250	2525	2826	2015

*Notes:* Authors' calculation based on the analytical sample in CLHLS 2018. Robust standard errors clustered at the province level; instruments are female ratio in the household and the square of female ratio in the household. "KP F" demotes Kleibergen-Paapak F statistics. All estimations include the control variables listed in Table 1.

\* $p < 0.1$ .

\*\* $p < 0.05$ .

\*\*\* $p < 0.01$ .



# Results

Table 3: Heterogeneity of the gender concordance effect (IV).

	(1)	(2)	(3)	(4)	(5)
	Self-rated health	Quality of life	Unmet LTC need	ADL	Depression score
<b>Daughter</b>					
<b>Daughter-in-law</b>					
2SLS Coeff.	0.509 (0.333)	0.792** (0.341)	-0.049 (0.380)	-3.182* (1.871)	-5.740 (3.854)
KP F	8.22	7.94	6.47	9.21	7.88
95% CLR conf set	[-0.13, 1.54]	[0.20, 1.98]	[-0.88, 0.78]	[-9.87, 1.20]	[-18.44, 2.90]
CLR test p-value	0.11	0.00	0.89	0.10	0.18
Sample Size	862	854	1076	1142	752
<b>Son</b>					
<b>Son-in-law only</b>					
2SLS Coeff.	0.293 (0.230)	-0.092 (0.223)	-0.126 (0.193)	-1.818 (1.355)	0.044 (3.613)
KP F	24.48	28.85	14.74	16.13	31.85
Sample Size	905	909	1066	1166	789
<b>85-99 age group</b>					
2SLS Coeff.	0.488** (0.235)	-0.118 (0.234)	-0.440* (0.242)	0.526 (1.605)	-1.612 (2.777)
KP F	19.93	25.06	6.60	7.08	22.33
95% CLR conf set			[-1.06, -0.01]	[-2.67, 3.94]	
CLR test p-value			0.04	0.72	
Sample Size	892	888	991	1082	805
<b>100+ age group</b>					
2SLS Coeff.	0.049 (0.078)	0.071 (0.102)	-0.038 (0.078)	1.520** (0.712)	-0.552 (2.661)
KP F	25.78	26.01	24.70	24.13	14.64
Sample Size	830	830	1110	1187	688
<b>Urban only</b>					
2SLS Coeff.	0.242 (0.196)	-0.133 (0.241)	-0.163 (0.117)	1.072 (1.176)	0.965 (3.329)
KP F	18.93	16.67	24.22	24.44	16.10
Sample Size	1301	1304	1455	1610	1180
<b>Rural only</b>					
2SLS Coeff.	0.438*** (0.147)	0.169 (0.166)	-0.294 (0.191)	0.116 (0.984)	-3.495 (3.526)
KP F	28.04	30.97	15.26	16.40	29.27
Sample Size	952	946	1070	1216	835

Notes: Authors' calculation based on the analytical sample in CLHLS 2018. Robust standard errors clustered at the province level; instruments are female ratio in the household and the square of female ratio in the household. "KP F" denotes Kleibergen-Paap rk F statistics. All estimations include the control variables listed in Table 1. The results for the 65-84 age group are not reported because of the relatively small sample size and poor performance of the 2SLS estimation.

\* $p < 0.1$ . \*\* $p < 0.05$ . \*\*\* $p < 0.01$ .

# Conclusion

- Disabled older adults who receive informal care from caregivers of the same gender:
  - ▶ More likely to receive adequate long-term care;
  - ▶ Enjoy better self-reported health.
- We analyze heterogeneity in gender concordance effect to identify which groups benefit in particular:
  - ▶ Older adults who live in rural area, and the 85-99 age group: enjoy better self-reported health;
  - ▶ Older adults who receive primary care from daughter and daughter-in-law: enjoy better self-reported quality of life and better mobility;
  - ▶ The 85-99 age group: more likely to receive adequate long-term care.
- Our results suggest:
  - ▶ The health of older male Chinese could be improved if they received more informal care from male caregivers.
  - ▶ LTC policies should encourage sons to care for fathers and provide advice and support for male caregivers.

Thank you!

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