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Research Article

Does Long-Term Care Insurance Reduce the Burden of Informal Family Caregiving? Evidence from China's Pilot Program

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Abstract

China's rapid population aging has intensified demand for long-term care and shifted much of the practical burden of daily care onto family members. This study examines whether China's long-term care insurance (LTCI) pilot program reduces informal family caregiving burden. Using data from the China Health and Retirement Longitudinal Study (CHARLS) for 2011, 2013, 2015 and 2018, supplemented by a secondary binary-outcome extension using the 2020 wave, the study links individual survey records with city-level LTCI implementation timing and estimates individual fixed-effects difference-in-differences models with city-clustered standard errors. The analysis distinguishes care participation from care intensity by examining any family care, monthly family-care hours, spouse care, child/grandchild care and high-intensity caregiving. The estimates show that family caregivers remain central after policy exposure, with the coefficient on any family care close to zero (0.023, p=0.357). The monthly-hours estimate is negative (-106.4 hours, p=0.366), and the formal-care coefficient is small (0.005, p=0.567). This pattern suggests that China's early LTCI pilots function more as a partial support mechanism for families than as a direct substitute for informal care. The findings highlight the importance of combining insurance coverage with stronger home- and community-based service supply, especially for older adults with severe care needs and households with limited family resources.

Keywords

Long-term care insurance, Informal family caregiving, Care burden, CHARLS, China, Staggered difference-in-differences

1. Introduction

Population aging has turned long-term care into a central social policy issue in China. According to the National Bureau of Statistics of China (2026), China had 323.38 million people aged 60 and above at the end of 2025, accounting for 23.0% of the total population; among them, 223.65 million were aged 65 and above, accounting for 15.9%. Aging is accompanied by rising care needs. The National Health Commission (2020) reported that more than 40 million older adults were disabled or semi-disabled, creating substantial demand for medical nursing, rehabilitation, daily assistance and home-based care services. In the absence of a mature public long-term care system, these needs have traditionally been absorbed by families. Spouses, adult children and other relatives provide daily assistance with dressing, bathing, eating, mobility and supervision. Such informal care is valuable, but it also imposes time costs, financial pressure and constraints on labor market participation. The expansion of old-age dependency and functional decline therefore makes family caregiving a private household burden and a core issue for social security reform.

Existing research shows that long-term care insurance (LTCI) can change the allocation of care between families and formal providers. Mommaerts (2025) and Coe et al. (2023) show that LTCI may alter the price of formal care, intergenerational care arrangements and spillover effects for adult children and spouses. Evidence from China also suggests that the LTCI pilot program can affect family care, formal service use and the well-being of older adults and their relatives (Chen & Ning, 2022; Pei et al., 2024; Wang & Liu, 2024). Recent China-based studies add more detail on this household adjustment. Shao et al. (2025) show that LTCI can change eldercare patterns, suggesting that insurance coverage may reshape how care tasks are divided between family members and formal providers. Shangguan et al. (2026) further link LTCI to adult children's urban-to-urban migration, indicating that care responsibilities may influence where adult children work and live. Related work by Shangguan et al. (2024) on grandparents' retirement and mothers' employment quality shows that intergenerational caregiving is also tied to household labor allocation. Together, these studies suggest that informal caregiving burden is embedded in family time allocation, mobility decisions and labor-market arrangements. The effect of LTCI on informal family caregiving is better understood as more than a simple substitution process. Family members may remain involved when formal services become more affordable, because household care includes emotional support, monitoring, coordination with providers and culturally embedded intergenerational responsibility. For this reason, the burden-reducing effect of LTCI may be reflected more in the intensity of family caregiving than in the binary incidence of whether family care occurs.

China's staggered LTCI rollout provides quasi-experimental variation for identifying changes in informal family caregiving. The national pilot began in 2016 and was expanded in 2020, with pilot cities differing in implementation timing, insurance eligibility and service arrangements. The 2020 guidance issued by the National Healthcare Security Administration and the Ministry of Finance stated

that the pilot should focus on the basic nursing needs of severely disabled persons and encouraged the use of home- and community-based care services (National Healthcare Security Administration & Ministry of Finance, 2020). These policy differences create variation that can be used to examine whether exposure to LTCI reduces informal family caregiving burden. This paper asks: Does LTCI reduce the burden of informal family caregiving? Using CHARLS data and pilot-city policy coding, the study distinguishes between care incidence and care intensity, examines formal-care use as a mechanism, and explores heterogeneity by care needs and family resources. The analysis contributes to the literature by showing that LTCI should not be evaluated only by whether family caregiving disappears. A more relevant question is whether the policy reduces the amount and intensity of family care while family members remain part of the long-term care arrangement.

2. Policy Background and Research Hypotheses

2.1. Policy background

China's LTCI pilots respond to a specific gap in the social insurance system: medical insurance mainly pays for treatment, while daily assistance after functional decline is usually left to families or purchased out of pocket. The policy therefore matters for this study because it may move part of long-term care from unpaid family members to reimbursed formal providers. Kim and Kwon (2021) show that South Korea's public LTCI made formal care a more practical alternative to family-only care arrangements.

The national pilot program began in 2016 and was expanded in 2020, but cities did not implement LTCI at the same time or with the same coverage rules. Some pilot cities covered only Urban Employee Basic Medical Insurance (UEBMI) participants at the beginning, while others also included Urban and Rural Resident Medical Insurance (URRMI) participants. For this reason, this paper defines policy exposure by pilot city, implementation timing, and insurance-based eligibility, not by self-reported LTCI use. This avoids treating take-up behavior as the policy variable.

This staggered rollout provides the basis for a difference-in-differences design: older adults in pilot cities can be compared with those in non-pilot cities before and after implementation. Kim and Mitra (2022) suggest that LTCI can influence household behavior beyond service use. Table 1 reports the main pilot cities used for treatment coding.

Table 1

Main LTCI pilot cities used for treatment coding

Batch	Province	Pilot city/area	Implementation time	Covered insurance
Local early pilot	Shandong	Qingdao	UEBMI: 2012-07; URRMI: 2015-01	UEBMI; URRMI

First batch	Jilin	Changchun	2015-05	UEBMI; URBMI
First batch	Jiangsu	Nantong	2016-01	UEBMI; URRMI
First batch	Anhui	Anqing	2017-01	UEBMI
First batch	Hubei	Jingmen	2017-01	UEBMI; URRMI
First batch	Shanghai	Shanghai	2017-01	UEBMI; URRMI
First batch	Sichuan	Chengdu	2017-06	UEBMI
First batch	Jiangsu	Suzhou	2017-06	UEBMI; URRMI
First batch	Hebei	Chengde	2017-07	UEBMI
First batch	Guangdong	Guangzhou	2017-08	UEBMI
First batch	Jiangxi	Shangrao	2017-09	UEBMI
First batch	Heilongjiang	Qiqihar	2017-10	UEBMI
First batch	Chongqing	Chongqing	2017-12	UEBMI
First batch	Zhejiang	Ningbo	2017-12	UEBMI

Notes. This table lists the main pilot cities used to construct policy exposure in the empirical design. Treatment coding combines pilot city status, implementation timing, and local insurance coverage. UEBMI refers to Urban Employee Basic Medical Insurance; URRMI refers to Urban and Rural Resident Basic Medical Insurance; URBMI refers to Urban Resident Basic Medical Insurance. The 2020 national expansion is used for the binary-outcome extension when comparable outcome information is available.

2.2. Research hypotheses

The first hypothesis concerns the total burden of informal family caregiving. In a household care decision, LTCI changes the relative cost of formal and informal care: when professional home-based, community-based, or institutional services are reimbursed, family members no longer have to provide all care through their own unpaid time. If reimbursed services cover routine assistance with bathing, dressing, mobility, or supervision, family members may shift part of their role from intensive hands-on care to coordination and companionship. Therefore, this study expects LTCI exposure to reduce informal caregiving burden, especially the intensity of family-provided care.

H1: Long-term care insurance reduces the burden of informal family caregiving.

The second hypothesis specifies the mechanism. LTCI is unlikely to eliminate family support, because relatives may continue to provide emotional companionship, monitoring, and occasional help. The expected reduction in informal care should occur mainly when the policy increases access to formal care. Miyawaki et al. (2020) show that changes in formal care availability alter the use of both formal and informal care in Japan, and Szenkurök (2026) similarly shows that public long-term care support can rebalance formal and family care arrangements in Europe. In China's pilots, reimbursement for home care, community care, or institutional care can replace part of the routine assistance that family members previously provided only when such services are accessible. The mechanism test should therefore focus on whether LTCI exposure increases formal care use while reducing family care intensity.

H2: Long-term care insurance reduces informal caregiving burden when it increases access to formal care.

The third hypothesis concerns heterogeneity. The effect of LTCI should be stronger when the potential demand for care is higher or when the household has fewer private resources to absorb care needs. Older adults with ADL or IADL limitations require more intensive help, so subsidized formal care has a larger scope to replace family time. Households with lower income, fewer co-resident family members, or weaker access to adult-child support may also gain more from public coverage because private care is less affordable before LTCI. Lei et al. (2022), Ning et al. (2024), and Sohn et al. (2020) show that LTCI effects may vary across family welfare, income and socioeconomic groups. These findings support testing whether the estimated effect differs by care need and family resources.

H3: The effect of long-term care insurance is stronger among older adults with greater care needs or fewer family resources.

These hypotheses translate directly into the empirical design. H1 is tested with measures of whether older adults receive family care and the intensity of that care. H2 is tested by examining formal care use as a mechanism, with the interpretation depending on whether formal-care uptake actually increases after policy exposure. H3 is tested by splitting the sample according to functional limitations and family-resource indicators.

3. Materials and Methods

3.1. Data

This study uses the China Health and Retirement Longitudinal Study (CHARLS), a national longitudinal survey of middle-aged and older adults in China (Peking University, National School of

Development, n.d.). The main binary-care panel covers the 2011, 2013, 2015 and 2018 waves, and the care-hour models use waves that provide comparable hour information; the 2020 wave is used only as a secondary extension for binary helper-type outcomes.

The Health Status and Functioning module is used to construct caregiving and functional-limitation measures. It is linked to demographic, family, income, insurance, and sample-information files by respondent ID, household ID, and community ID. Care-need respondents are defined as individuals for whom ADL/IADL assistance questions are substantively observed. The analytic sample is restricted to observations with harmonized caregiving outcomes, observed insurance eligibility, and a verified geographic match to LTCI policy coding.

In the constructed 2011-2018 panel, 102,344 person-wave records are initially observed. Restricting the sample to respondents aged 45 or above leaves 74,078 records; restricting to care-need respondents leaves 20,574 records; excluding observations with unobserved insurance eligibility leaves 19,974 records for the binary-care models. The monthly family-care-hours models use 9,809 observations because comparable hour information is available only for the relevant waves. The 2020 binary extension contains 27,413 observations for any family care and 27,234 observations for formal care.

3.2. Variables

The outcomes measure both the extensive and intensive margins of family caregiving. The primary outcome is monthly informal family caregiving hours, constructed from helper relationship, care days and hours per day. Secondary outcomes are any informal family caregiving, relationship-specific caregiving, and high-intensity caregiving. This outcome design follows previous LTCI work which distinguishes between family care and formal care when evaluating substitution between care sources (Zhang et al., 2020). The baseline hour-based outcome is estimated in levels because monthly care hours have a direct interpretation as caregiving time burden. Given the highly right-skewed distribution of care hours, the robustness checks also use a 99th-percentile winsorized outcome and an inverse hyperbolic sine transformation.

The treatment variable is LTCI exposure, defined as Pilot city x Post policy x Insurance eligible. An individual is treated only if the interview took place after the local LTCI was implemented and the respondent belonged to the insurance group covered by the local pilot. Because CHARLS reports public health-insurance coverage more consistently than fine-grained UEBMI/URRMI categories across waves, insurance eligibility is operationalized with wave-specific public-insurance status and city-level coverage rules in Table 1 rather than self-reported LTCI take-up. Respondents with missing or ambiguous insurance information are excluded from treatment coding. In the constructed core sample, the matched city identifier remains stable across waves, which supports consistent city-level

policy assignment. This definition follows the institutional setting of China's pilots, where coverage rules and service packages are heterogeneous across cities (Li et al., 2024).

Control variables capture care demand and family care capacity: Age, gender, marital status, education, household structure and children, ADL/IADL limitations, health status, insurance type, income, and pension receipt. ADL/IADL limitations measure functional care need, while self-rated health captures broader health status; both are retained because care need and general health may affect caregiving through different channels. The baseline resource controls use household income, pension receipt, household size and number of children because these measures are consistently retained in the harmonized analysis panel across estimation waves. Formal care is investigated as a mechanism, and hence it is excluded from the baseline control set. We include health and insurance controls, as LTCI is closely related to medical service use and expenditure patterns (Feng et al., 2020).

Table 2 summarizes the definitions of the key variables used in the empirical analysis.

Table 2

Definitions of key variables

Type	Variable	Definition
Outcome	Monthly informal family care hours	Total monthly ADL/IADL care hours provided by family members.
Outcome	Any informal family care	Equals 1 if the respondent receives any family-provided ADL/IADL help.
Outcome	Relationship-specific care	Care hours measured separately for spouse, adult children, and other relatives when helper fields permit.
Outcome	High-intensity family care	Equals 1 for care hours in the top quartile among respondents with positive family care.
Mechanism	Formal care use	Use of paid, institutional, community, or other non-family care.
Treatment	LTCI exposure	Pilot city x post-policy interview x local insurance eligibility.
Controls	Demographics, care needs, and resources	Age, gender, education, family structure, ADL/IADL limitations, health status, income, pension receipt, and insurance type.

Notes. ADL = activities of daily living; IADL = instrumental activities of daily living; LTCI = long-term care insurance.

3.3. Methods

The baseline specification is an individual fixed-effects difference-in-differences model that compares changes in the outcome of caregiving before and after LTCI exposure between the exposed and unexposed respondents:

$$Y_{ict} = \alpha_i + \lambda_t + \beta \text{LTCI}_{ict} + X'_{it}\gamma + \varepsilon_{ict} \quad (1)$$

In this equation, the dependent variable is the respondent i's, in city c, caregiving outcome in wave t; the treatment term is a measure of LTCI exposure; individual and wave fixed effects capture time-invariant respondent characteristics and common shock to the wave; X'_{it} gamma denotes time-varying covariates; and the coefficient on the LTCI exposure is the parameter of interest.

Because of staggered adoption of LTCI, a standard two-way fixed-effects estimate may combine already-treated and new treated cohorts. Recent DID studies therefore motivate a cautious reading of the baseline estimates under staggered policy timing (Callaway & Sant'Anna, 2021; Goodman-Bacon, 2021; Sun & Abraham, 2021). The baseline estimates are assessed together with event-study evidence, sensitivity checks that exclude the early Qingdao pilot, and alternative exposure definitions.

$$Y_{ict} = \alpha_i + \lambda_t + \sum_{k \neq -1} \delta_k \text{EventTime}_{ict}^{k} + X'_{it}\gamma + \varepsilon_{ict} \quad (2)$$

The event-study specification assesses whether treated and untreated respondents followed similar pre-policy paths and describes post-policy adjustment. For the late-pilot event study, 2015 is the omitted pre-policy year. Standard errors are clustered at the city level.

4. Results

4.1. Descriptive statistics

The analysis is restricted to care-need respondents with valid ADL/IADL care information. The main specifications draw on the harmonized 2011, 2013, 2015 and 2018 CHARLS waves, which provide comparable measures of informal family care and, in most waves, care hours. Because the 2020 questionnaire identifies helper types without the same monthly care-hours measure, results using 2020 are reported separately for binary care-incidence outcomes.

Table 3 shows that informal family care is common among older adults with care needs. In the full sample, 66.3% of respondents report receiving informal family care, and the mean monthly family-care time is 289.4 hours. The treatment group is close to the control group in care incidence: 65.4% versus 66.4%, a difference of only -0.9 percentage points. The more visible pre-regression difference lies in care intensity. Treated respondents report 267.3 monthly family-care hours, compared with 291.0 hours in the control group, and the high-intensity-care rate is 46.8% in the treatment group versus 53.7% in the control group. Formal care remains rare in both groups, at 0.7% and 0.9%, respectively.

The covariates also show clear cross-sectional differences between the treatment and control groups. Respondents in pilot-city exposure cells are less rural than those in the control group (57.1% versus 69.0%), have fewer living children (2.99 versus 3.30), and report a lower average ADL/IADL

limitation count (1.38 versus 2.39). These differences motivate the use of individual fixed effects, wave fixed effects and covariate controls in the DID specification.

Table 3

Descriptive statistics for care-need respondents

Variable	Full sample	Treatment	Control	Difference	N
Any informal family care	0.663	0.654	0.664	-0.009	19,974
Monthly family-care hours	289.381	267.253	291.026	-23.773	9,809
High-intensity informal care	0.532	0.468	0.537	-0.069***	9,809
Any formal care	0.009	0.007	0.009	-0.002	19,814
Age	65.445	65.850	65.414	0.436	19,974
Female	0.615	0.610	0.616	-0.006	19,974
Married/partnered	0.777	0.778	0.777	0.001	19,974
Rural residence	0.681	0.571	0.690	-0.118***	19,974
ADL limitation count	1.283	1.227	1.287	-0.060	19,974
Number of living children	3.125	2.925	3.141	-0.216***	19,974
IHS household income	8.961	9.218	8.941	0.278***	19,974
Public health insurance	0.926	1.000	0.921	0.079***	19,974

Notes. Treatment refers to respondents in pilot cities with observed public-insurance eligibility in the harmonized 2011-2018 panel. Difference is Treatment minus Control. * p<0.10, ** p<0.05, *** p<0.01.

4.2. Main empirical results

Table 4 reports the baseline DID estimates. The coefficient for any informal family care is 0.023 with a standard error of 0.025 and p-value of 0.357, indicating a very small extensive-margin response. Substantively, family care continues to be present after LTCI exposure, which is consistent with the role of relatives in daily supervision, companionship and care coordination. This pattern is important because it shows that the policy effect should be assessed through care intensity as well as through the binary incidence of family care.

The hours-based outcomes move in the expected direction, but the estimates should be read cautiously. The point estimate for monthly family-care hours is -106.4, with a standard error of 117.3 and a p-value of 0.366; the point estimates are -10.5 for spouse-care hours and -36.0 for child/grandchild-care hours. The estimated coefficient for high-intensity care is -0.054. These

estimates are read as suggestive evidence of intensive-margin adjustment with limited statistical precision.

Taken together, these results distinguish between family-care participation and time burden. The binary outcome indicates continued family involvement after LTCI exposure. The hours outcomes move in the expected direction, but the statistical precision of these estimates is limited. The main results therefore point to a cautious interpretation of intensive-margin adjustment, meaning that LTCI may reduce the amount of family care required even when family members remain part of the care arrangement.

Table 4

Estimated effects of LTCI on informal family caregiving

Outcome	LTCI exposure	p-value	95% CI	N	Individuals	Cities	Within R^2
Any informal family care	0.023 (0.025)	0.357	[-0.026, 0.073]	19,974	11,110	125	0.006
Monthly family-care hours	-106.438 (117.330)	0.366	[-336.406, 123.529]	9,809	6,919	125	0.007
Monthly spouse-care hours	-10.506 (21.200)	0.621	[-52.058, 31.047]	9,418	6,747	125	0.000
Monthly child/grandchild-care hours	-36.027 (110.655)	0.745	[-252.911, 180.856]	12,883	7,855	125	0.008
High-intensity informal care	-0.054 (0.070)	0.441	[-0.192, 0.083]	9,809	6,919	125	0.007

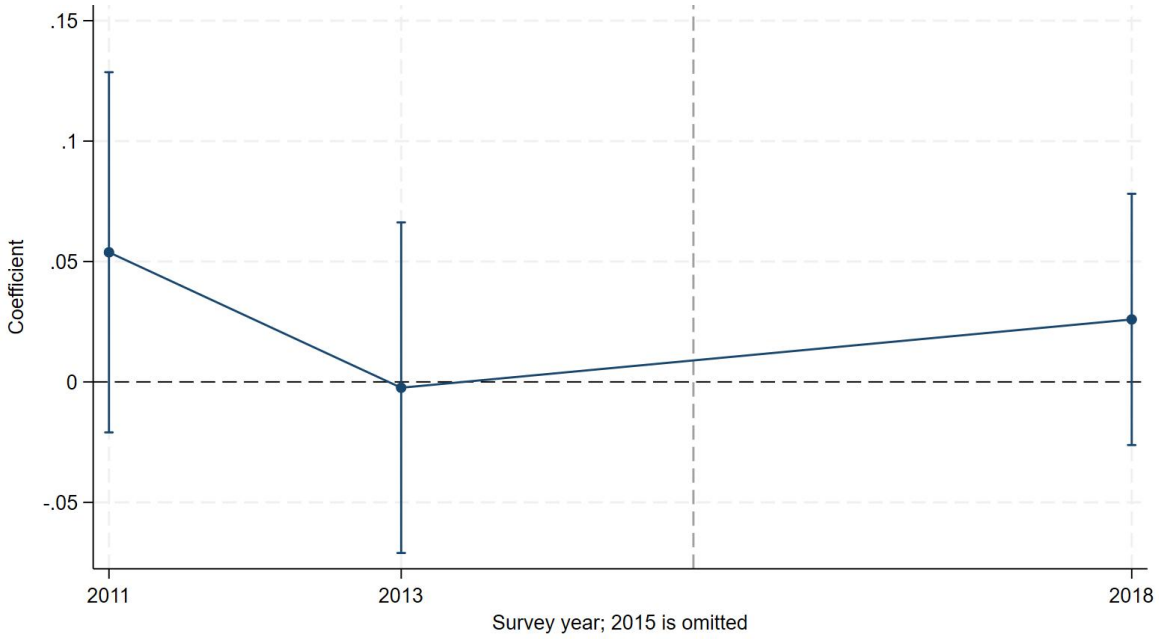
Notes. Models include individual fixed effects, survey-year fixed effects and time-varying controls for age, marital status, rural residence, ADL limitations, household size, children, income, pension receipt and work status. Standard errors are clustered at the city level. The table reports observations, individuals and city clusters. * p<0.10, ** p<0.05, *** p<0.01.

Figure 1 presents the event-study estimates for late pilot cities, using 2015 as the omitted pre-policy year. The 2011 coefficient is 0.054 and the 2013 coefficient is -0.002; both confidence intervals include zero. The 2018 post-policy coefficient is 0.026. This dynamic pattern is consistent with the baseline result that family care remains present after LTCI exposure, while the pre-policy estimates

provide a check on the identifying comparison.

Figure 1

Dynamic effects of LTCI on informal family care



Notes. The figure reports coefficients and 95% confidence intervals from an individual-fixed-effects event-study model for late pilot cities. The omitted category is 2015. The outcome is informal-care incidence. Observations by wave are 2,477 in 2011, 5,457 in 2013, 5,909 in 2015 and 6,081 in 2018.

4.3. Heterogeneity, mechanism, and robustness tests

Table 5 interacts first with the formal-care mechanism. The coefficient on any formal care is 0.005, with standard error 0.009 and p-value of 0.567. This estimate is small and statistically imprecise, indicating limited observed formal-care uptake in the CHARLS care-need sample. A plausible interpretation is that insurance coverage may have been introduced before formal home- and community-based services became sufficiently available or frequently used.

The heterogeneity estimates show suggestive differences by care need and family resources. The coefficient for any family care is 0.092 among respondents with at least two ADL limitations, and -0.005 among respondents with fewer limitations; the subgroup-difference p-value is 0.112. The estimate is larger among unmarried respondents (0.127) than among married/partnered respondents (-0.017), with a subgroup-difference p-value of 0.107. These differences suggest that households with higher care needs or lower spousal support tend to persist in the use of family members even after exposure to LTCI. That is one way to understand why the policy response shows up more in care intensity than in the raw incidence of family caregiving.

The robustness checks are reported with standard errors, p-values, sample sizes and city clusters.

Excluding Qingdao, the early local pilot, yields a coefficient of 0.021, close to the baseline estimate of 0.023. Using a city-level exposure definition without insurance eligibility gives a slightly larger coefficient of 0.032. The placebo estimate based on a simulated 2015 treatment timing among late pilots is -0.051 and statistically significant at the 5% level, showing that pre-policy differences matter for the incidence outcome. For the skewed hour outcome, winsorizing monthly family-care hours at the 99th percentile gives an estimate of -164.4, while the inverse hyperbolic sine specification gives an estimate of -0.314. These checks reinforce the need for cautious interpretation of the baseline incidence and hour-based estimates.

Results based on the 2020 binary outcomes are presented as a secondary extension and align with the main incidence pattern. After adding the 2020 wave, the estimated effect on any family care is -0.013 with a standard error of 0.049, and the effect on any formal care is 0.005 with a standard error of 0.013. These estimates indicate continued family involvement in 2020 as well. Because the 2020 questionnaire records helper categories rather than the same monthly care-hours structure, this extension serves as an extensive-margin check alongside the hours-based analysis.

Table 5

Mechanism, heterogeneity, robustness and 2020 binary-extension checks

Analysis component	Outcome	Estimate	p-value	N	Individuals	Cities	Subgroup-difference p-value
Mechanism	Any formal care	0.005 (0.009)	0.567	19,814	11,042	125	
Heterogeneity	ADL limitations >=2	0.092 (0.056)	0.105	6,201	4,077	125	0.112
Heterogeneity	ADL limitations <2	-0.005 (0.028)	0.863	13,749	9,251	125	0.112
Heterogeneity	Rural respondents	0.046 (0.039)	0.232	13,602	7,286	98	0.359
Heterogeneity	Urban respondents	-0.028 (0.036)	0.445	6,372	3,824	103	0.359
Heterogeneity	Married/partnered	-0.017 (0.027)	0.537	15,521	8,987	125	0.107

Heterogeneity	Unmarried	0.127 (0.080)	0.116	4,452	2,547	125	0.107
Robustness	Exclude Qingdao early local pilot	0.021 (0.027)	0.430	19,924	11,080	124	
Robustness	City-level exposure without insurance eligibility	0.032 (0.025)	0.200	19,974	11,110	125	
Robustness	Placebo policy in 2015 among late pilots	-0.051** (0.025)	0.046	13,843	9,057	124	
Robustness	Winsorized monthly family-care hours, 99th percentile	-164.423*** (48.623)	0.001	9,809	6,919	125	
Robustness	IHS monthly family-care hours	-0.314 (0.357)	0.379	9,809	6,919	125	
2020 binary extension	Any informal family care	-0.013 (0.049)	0.790	27,413	13,234	125	
2020 binary extension	Any formal care	0.005 (0.013)	0.722	27,234	13,164	125	

Notes. All rows except the 2020 extension use the 2011-2018 harmonized panel. The 2020 extension uses binary helper-type outcomes only. The table reports observations, individuals and city clusters. Subgroup-difference p-values are from interaction tests using the same fixed-effects specification. Hour-distribution checks use monthly family-care hours; the winsorized outcome caps values at the 99th percentile (3,493.6 hours), and IHS denotes inverse hyperbolic sine transformation. Standard errors are clustered at the city level. * p<0.10, ** p<0.05, *** p<0.01.

Overall, the results show that China's pilot LTCI program is associated with persistent family-care incidence and possible adjustment in caregiving intensity. The hours-based outcomes move toward lower care intensity, with wide confidence intervals. This pattern is substantively meaningful because family members often continue to provide emotional support, supervision and care coordination even when formal services become available.

5. Discussion

The findings answer the research question in two parts. The estimated effect on any family care is 0.023, suggesting that family caregivers remain involved after LTCI exposure. The monthly-hours estimate is negative (-106.4), with a standard error of 117.3 and a p-value of 0.366; this result is therefore interpreted as suggestive evidence with wide confidence intervals. Distinguishing incidence from intensity shows why caregiving burden is better assessed not only by whether family care occurs, but also by how much time family members provide. For older adults with care needs, family care is not only a service that can be replaced by the market; it is also an arrangement shaped by trust, co-residence and intergenerational responsibility.

This interpretation clarifies why the findings differ from studies that report stronger substitution between formal and informal care. In the CHARLS sample, the mechanism estimate for formal-care use is 0.005, indicating that policy exposure is associated with only limited observed formal-care uptake. Evidence from South Korea shows that public LTCI changes older adults' use of medical services, while Chinese studies document spillovers for spousal caregivers and informal caregivers' labor participation (Cho & Kwon, 2023; Jiang & Yang, 2023; Zhang et al., 2026). These comparisons suggest that LTCI works through the institutional environment around care delivery, including benefit generosity and the availability of home- and community-based services.

These findings point to two policy implications, framed around service availability. Expanding LTCI should be accompanied by support for family caregivers and by stronger home- and community-based formal care. Training, respite care and case-management services can be considered as complementary support for families that continue to provide daily assistance, while benefit design should pay attention to low-income households and older adults with severe disability.

6. Conclusion

This paper examines whether China's pilot LTCI program reduces the burden of informal family caregiving. Using CHARLS panel data and policy variation across pilot cities, the analysis distinguishes between the incidence and intensity of family care. The results show continued family involvement after LTCI exposure, while hours-based estimates provide suggestive evidence of possible reductions in care intensity.

Overall, LTCI is best understood as a complement to family care within China's long-term care system. Its burden-reducing effect depends on whether insurance coverage is matched by reliable formal services and caregiver support. Future LTCI expansion should therefore strengthen service availability and target high-need households while recognizing family caregivers as part of the long-term care system.

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Author contributions

Fanqi Wei individually undertook all roles including conceptualization, methodology, validation, formal analysis, investigation, resources, data curation, original draft writing, review & editing, visualization, supervision and project administration for this study, and has read and agreed to the published version of the manuscript.

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Data availability

The data used in this study are publicly available from the China Health and Retirement Longitudinal Study (CHARLS) website (https://charls.pku.edu.cn/en/). Access to the data requires user registration and compliance with the CHARLS data-use requirements. This study used the 2011, 2013, 2015, 2018, and 2020 CHARLS waves.

Declarations

Conflict of interest

The author declares that there is no conflict of interest.

Ethics approval

Not applicable.

Consent to participate

Not applicable.

Consent for publication

Not applicable.

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