



China's Expanded Network Coverage and the Mental Health of the Elderly and Adult Population



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Abstract

This study examines the mental health impact of China's 2017 cross-provincial direct settlement reform, which enabled inpatient reimbursement outside one's registered hukou locality. **Using five waves of CHARLS data (2011–2020) and a difference-in-difference-in-differences (DDD) design, we identify the reform's causal effect on depressive symptoms among older migrants.** The results show that expanding insurance portability significantly reduces CES-D scores for migrant older adults, with no parallel pre-policy differences. **The findings highlight hukou lock as a barrier to mental well-being and demonstrate that improving portability yields meaningful psychological gains.**

Introduction

China's health insurance system historically tied reimbursement eligibility to hukou registration, creating institutional barriers for internal migrants seeking care outside their home province. This hukou lock limits access, increases financial uncertainty, and may worsen mental health. In 2017, China introduced a nationwide cross-provincial direct settlement system, allowing inpatient expenses to be reimbursed in real time. This reform provides a natural quasi-experiment to evaluate how improving portability affects psychological well-being among migrant older adults.

The 2017 reform created a national platform allowing real-time cross-provincial medical insurance reimbursement. Before the reform, elderly migrants and other non-local residents had to pay inpatient costs upfront and return home for reimbursement, creating major financial and administrative barriers. By enabling direct settlement at the point of care, the reform improved insurance portability, reduced uncertainty, and expanded access to healthcare for mobile older adults—making it an ideal setting to study impacts on mental health.

Table 1. Summary statistics of cleaned variables

| Variable | N | Mean | SD | Min | Max |
|----------|-------|-------|-------|-----|-----|
| CESD | 39592 | 8.265 | 6.247 | 0 | 30 |
| Migrant | 39592 | 0.105 | 0.306 | 0 | 1 |
| Hospital | 39592 | 0.354 | 0.478 | 0 | 1 |

Methods and Materials

We use five waves of the China Health and Retirement Longitudinal Study (CHARLS 2011–2020), focusing on individuals aged 45 and above. **The study employs a DDD design leveraging variation across time (pre/post 2017), space (provinces with high vs. low hospital participation), and population groups (migrants vs. non-migrants).** Mental health is measured using the CES-D 10 score (0–30). The analysis includes individual and year fixed effects, robust standard errors, and event-study tests confirming parallel trends.

$$\text{CESD}_{it} = \beta_0 + \beta_1 \text{PostPolicy} \times \text{hospital}_c \times \text{migrant}_{it} + \beta_2 \text{PostPolicy} \times \text{hospital}_c + \beta_3 \text{PostPolicy} \times \text{migrant}_{it} + \beta_4 \text{hospital}_c \times \text{migrant}_{it} + \beta_5 \text{hospital}_c + \beta_6 \text{migrant}_{it} + \emptyset \text{Controls}_{i,c,t} + \gamma_i + \delta_t + \varepsilon_{it} \quad (1)$$

Table 2. Triple difference results

| Variable | CESD | ADL | IADL | HospitalTime | DoctorTime |
|---------------|----------------------|---------------------|------------------|------------------|------------------|
| Triple | -1.249*** (0.206) | -0.122** (0.034) | 0.002 (0.047) | 0.089 (0.068) | 0.085 (0.128) |
| Individual FE | YES | YES | YES | YES | YES |
| Year FE | YES | YES | YES | YES | YES |
| R-squared | 0.056 | 0.056 | 0.069 | 0.015 | 0.005 |

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Results

The reform significantly reduced depressive symptoms among migrant older adults. DDD estimates show a notable decline in CES-D scores post-2017 for migrants in high-participation provinces, whereas non-migrants experienced no comparable improvement. **Event-study coefficients indicate no pre-policy differences and a clear post-policy decline in depressive symptoms.** Heterogeneity analysis shows stronger benefits for lower-income, rural, and female migrants. These results suggest improved insurance portability enhanced financial security and access to inpatient care.

We test whether improved insurance portability enhanced elderly mental health by increasing contact with adult children. Using CHARLS measures of visit and phone communication, we estimate mediation effects through intergenerational interaction. Results show no significant mediation, suggesting the reform's mental health benefits stem mainly from improved access to healthcare rather than changes in family communication.

Table 3. Within group - results for HighSchool and Gender

| | High school below | High school and above | Female | Male |
|---------------|----------------------|--------------------------|----------------------|-------------------|
| Variable | CESD | CESD | CESD | CESD |
| Triple | -1.315*** (0.269) | -0.701 (1.553) | -2.136*** (0.404) | -0.521 (0.371) |
| Individual FE | YES | YES | YES | YES |
| Year FE | YES | YES | YES | YES |
| R-squared | 0.081 | 0.059 | 0.072 | 0.067 |

Discussion

The findings support the interpretation that dismantling hukou lock—by enabling cross-provincial reimbursement—reduces both financial uncertainty and psychological stress among elderly migrants. The reform eased institutional barriers that previously limited timely care-seeking and created insecurity around medical expenses. The mental health gains observed are consistent with pathways identified in behavioral health and welfare economics. However, long-term effects, spillovers, and interactions with service availability warrant further research.

Table 4. Robustness test results - linear probability model

| Variable | CESD |
|---------------|----------------------|
| Triple | -0.104*** (0.018) |
| Num of obs | 39,592 |
| Individual FE | YES |
| Year FE | YES |

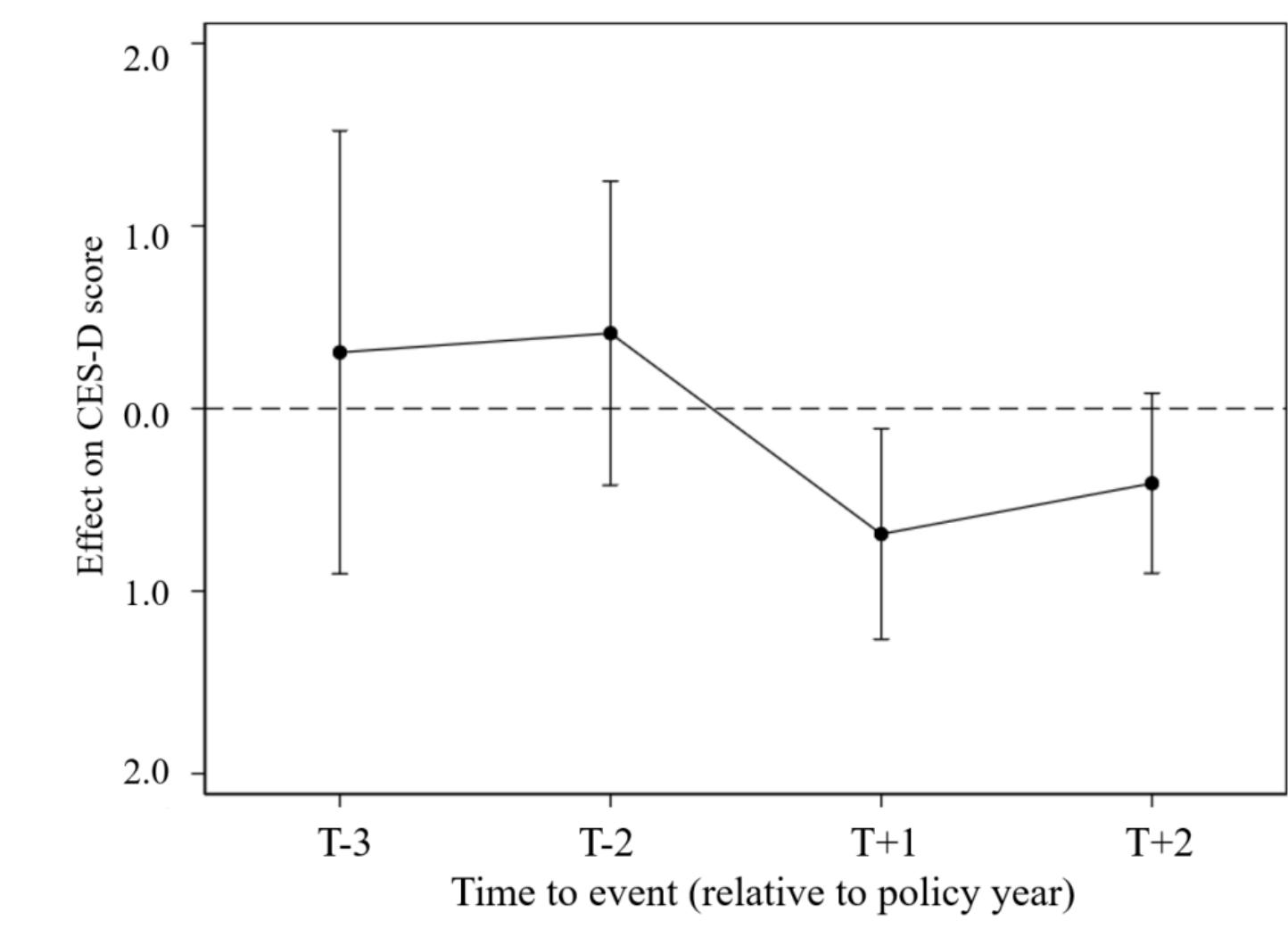


Figure 1. Event-study coefficients over time.

Conclusions

China's 2017 insurance portability reform improved mental health among older migrants by reducing depressive symptoms and easing hukou-based constraints. These results illustrate how institutional design in health insurance systems can shape psychological well-being, not only access and financial outcomes. Enhancing portability and reducing bureaucratic barriers should remain central to health policy reform, particularly in highly mobile and aging societies. Policymakers should consider expanding direct settlement and integrating mental health into future insurance reforms.

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