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Are mobile phone and migration complementary?  
Evidence from their impacts on child's health in rural China

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# Are mobile phone and migration complementary? Evidence from the impacts on child's health in rural China



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## Introduction

- The mobile phone is to be one of the important driving forces of social development and economic growth.
- Mobile phones have significantly improved the access to information and mitigate information asymmetry.
- It is estimated that in 2016 more than 180 million migrant workers were living and working in China's cities.
- The researchers internationally have documented the mixed impacts of migration on the children's health due to the lack of parental monitoring or care and the possible increase of remittance.

## Objectives

- To examine whether there exists the complementary effect of mobile phone and migration on children's health.
- Given the endogeneity of mobile phone and migration, instrumental variables (IVs) are used to address the problem.

## Data

- The dataset used for this study is from the China Health and Nutrition Survey (CHNS).
- Rural children at age cohorts 1-16 are included in this study.
- The waves from CHNS are 2004, 2006, 2009, 2011 and 2015.
- The key dependent variable is height-for-age z -score (HAZ).
- Independent variable of interests include:
  - Mobile phone is measured as dummy (1= the caregiving of the children has a mobile phone; 0 otherwise)
  - Migration is a dummy (1=both of the parents migrate; 0 otherwise)

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## Empirical model

The probability of having a mobile phone of the child's caregiver are estimated as

$$P_{it}^* = \alpha Z_{it} + \mu_{it} \text{ with } P_{it} = \begin{cases} 1 & \text{if } P_{it}^* > 0 \\ 0 & \text{otherwise} \end{cases} \quad (1)$$

The probability of both of the child migrate are estimated as

$$M_{it}^* = \gamma Z_{it} + \varepsilon_{it} \text{ with } M_{it} = \begin{cases} 1 & \text{if } M_{it}^* > 0 \\ 0 & \text{otherwise} \end{cases} \quad (2)$$

here  $P_{it}=1$  and  $M_{it}=1$  indicate that the caregiver has a mobile phone and both of child's parents migrate, respectively.  $Z_{it}$  are the control variables of the child's gender, age, parents' education and height, family size and income, etc. and community variables. Eqs (1) and (2) are estimated by bivariate probit model with IVs.

HAZ is estimated as follows:

$$HAZ_{it} = \beta_0 + \beta_1 \widehat{P}_{it} + \beta_2 \widehat{M}_{it} + \beta_3 \widehat{P}_{it} \times \widehat{M}_{it} + \delta Z_{it} + \tau_{it} \quad (3)$$

$\widehat{P}_{it}$  and  $\widehat{M}_{it}$  are the probability of mobile phone and migration estimated from bivariate probit models;  $Z_{it}$  is the same as above.

**Table 1.** Random effects estimation of Eq (3) (D.V.: HAZ)

	Phone	Mig	Phone*Mig	Control for Z	Province FE	First stage	Obs.
Phone	0.271 (0.33)	0.473 (0.35)	0.617*** (0.24)	Yes	Yes	biprobit	3286
Mig	1.168** (0.58)	1.839* (1.09)	0.928* (0.54)	Yes	Yes	IV biprobit	3286
Phone*Mig		0.408 (0.84)	0.834* (0.46)	Yes	Yes		3286
Control for Z	Yes	Yes	Yes	Yes	Yes		
Province FE	Yes	Yes	Yes	Yes	Yes		
First stage	biprobit			IV biprobit			
Obs.	3286	3286	3286	3286	3286		3286

Notes: \*, \*\*, and \*\*\* indicate significance at the 1%, 5%, and 10% level; standard errors in parentheses are clustered at county level.

## Results

**Table 2.** Bivariate probit estimation with IVs

D.V.:	Phone		Mig	
	Coef.	S.E.	Coef.	S.E.
Communication Score	0.175***	(0.02)		
Agri. Tax			-0.782***	(0.20)
logMiniWage			0.499*	(0.21)
Agri. Tax *logMiniWage			0.125***	(0.03)
Control for Z	Yes		Yes	
Province fixed effects	Yes		Yes	
Chi2			16.87	
Obs.	3286		3286	

Notes: \*, \*\*, and \*\*\* indicate significance at the 1%, 5%, and 10% level; standard errors in parentheses are clustered at county level.

**Table 3.** Random effects estimations by age cohorts (D.V.: HAZ)

Age cohorts	1-10	11-13	14-16
Phone	1.352*** (0.45)	-0.020 (0.48)	0.075 (0.33)
Mig	1.404 (1.48)	1.116 (1.21)	3.781*** (1.04)
Phone*Mig	0.117 (0.67)	-0.037 (0.99)	3.162*** (0.59)
Control for Z	Yes	Yes	Yes
	Yes	Yes	Yes
First stage	IV biprobit		
Obs.	1588	941	757

Notes: \*, \*\*, and \*\*\* indicate significance at the 1%, 5%, and 10% level; standard errors in parentheses are clustered at county level.

## Summary

- The results show that there exist the complementary effects of mobile phone and migration when analyzing their impacts on child's HAZ in rural China.
- Without considering the endogeneity of mobile phone and migration, their impacts on child's HAZ is biased.