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Effects of public health policies on the health status and medical service utilization of Chinese internal migrants☆

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ABSTRACT

This paper examines the effects of the “Equalization Program of Basic Public Health and Family Planning Services for Migrants” (EHFPSM), a novel internal migrant-targeted public health policy, of China implemented in 2013. By combining the individual-level data from the “China Migrants Dynamic Survey” and city-level statistical data, we find that EHFPSM contributes to a 6.9% statistically significant increase in the probability of electronic health records coverage and a 7.2% increase in the probability of reimbursement in the last inpatient visit, as well as a 1.2% decrease in the probability of one-year prevalence. The mechanism test shows that this program promotes the migrants’ understanding of the policies and social insurance coverage to enhance their health status. EHFPSM brings about more significant decreases in disease prevalence for male and less-educated migrants, and higher reimbursement probability for urban hukou migrants. Our paper facilitates better understanding of the role of public health policies in promoting the internal migrants’ health from the perspective of China.

1. Introduction

Health, which is a crucial part of human capital, may largely represent wealth especially for low socioeconomic status individuals (Grossman, 1972). Public health policies may enhance the benefits from this human capital (Li et al., 2017). Much of the economic literature about health policies has been focused on the impact of health policies on international migrants or rural residents, while the impact of public health policies on internal migrants in developing countries has been less understood, which in fact is extremely...
important for policy-makers in coping with decreasing population dividend and public health emergency, such as the COVID-19 epidemic. This paper intends to evaluate the effects of a novel public health policy of China on the basic public health service coverage, health status and medical service utilizations of internal migrants in the destination cities.

We evaluate how public health policies affect internal migrants from the perspective of a unique policy of China: the “Equalization Program of Basic Public Health and Family Planning Services for Migrants” (EHFPSM), which was issued in the end of 2013. Forty prefecture-level cities are assigned as the pilot cities, and a series of free basic public health and family planning services are provided to the internal migrants. There are some advantages of using this program in our study. First, the program provides a unique quasi-natural experiment for this study to clearly identify the effect of EHFPSM. Second, much of the previous research assesses the effect of medical insurances to reduce the burden of illness (Qin, Pan, & Liu, 2014), while we investigate the effect of public health services to promote and maintain the health status of migrants. Besides, the combination of the individual-level “China Migrants Dynamic Survey” (CMDS) data and city-level statistical data facilitates a better understanding of the effects of public health policies on the health welfare of internal migrants, who have enormous difficulties in accessing to those services before the implementation of this program (Gao, Yang, & Li, 2012; Kinnan, Wang, & Wang, 2018; Meng, 2012).

Extensive economic studies have been conducted about the impacts of public policies on the health of migrants in developed countries (Hardy et al., 2012; Hatzenbuehler et al., 2017; Rhodes et al., 2015). For example, Perreira and Pedroza (2019) summarized the literature concerning the influence of public policies on American immigrants’ health and found that inclusive policies promote their health service coverage and adaptation to the United States, whereas exclusive policies have the opposite impacts. In contrast to many developed countries, where migrants have access to essential services such as basic healthcare and schooling with the same conditions as legal residents (Pinotti, 2017), China’s internal migrants have a high transaction cost in access to basic public health services (Di Napoli, Petrelli, Rossi, Mirisola, & Rosano, 2018; Hu, Cook, & Salazar, 2008; The Lancet., 2017). Besides, because of the late implementation of migrant-targeted public health policies in China, little research attention has been paid to the impact of those policies on migrants, except for only one study of Wang, Cheng, and Ni (2019). They found a positive association between EHFPSM and medical service utilization but failed to tackle the endogeneity problem of migrants’ selection of the destination cities. To sum up, there is still a lack of comprehensive studies of how public health policies influence the health status and health welfare of internal migrants, and the present study aims to fill this gap.

In this study, based on the individual-level data from CMDS and the city-level statistical data, we comprehensively evaluate the effects of EHFPSM implementation on the internal migrants’ basic public health service coverage and health status, as well as the spillover effect on their medical service utilization during 2013–2014 by combining the methods of PSM and DID. The results show that EHFPSM significantly increases the basic public health service coverage and improves health status, as well promotes the medical service utilization of the migrants. We then investigate the underlying mechanisms and find that EHFPSM imposes its positive effect on migrants through strengthening their awareness of “electronic health records” (EHRs), “Urban Employee Basic Medical Insurance” (UEBMI) coverage and “work injury insurance” (WII) coverage. We further compare the equalization effect of EHFPSM between different subgroups and find that EHFPSM brings about more significant positive impacts on less-educated or male migrants in health status, and on the urban hukou migrants in medical service utilization. Finally, several robustness checks are carried out. Specifically, we conduct an additional control of “New Rural Cooperative Medical Insurance” (NRCMI) and EHFPSM from the aspects of financing level, and service scope. The rural hukou migrants refer to those who hold a rural hukou and have flowed from agricultural to non-agricultural sectors. The urban hukou migrants are those who hold an urban hukou in towns or cities that they do not reside in.

2. Institutional background

China’s primary health service system was initiated in the early 1950s, which had substantially reduced the occurrence of communicable, maternal, and neonatal diseases throughout the 1960s and 1970s. Moreover, it helped to advance the global primary
health-care movement in 1978 enshrined in the Declaration of Alma-Ata (Li et al., 2017). In the late 1970s, China started its economic reform with obvious urban-biased policies. The rationing system guaranteed permanent jobs for urban hukou labors and provided urban residents with access to primary food, housing, and education, as well as healthcare, at quite low prices. In contrast to the large government expenditure for urban residents, expenditure for rural residents was much lower. For example, the number of hospital beds and medical staff for every 1000 people in cities was 4.57 and 7.82 in the 1980s, while it was merely 1.48 and 1.81 in rural areas (Zhang & Kanbur, 2005). As a result, the medical and health welfare enjoyed by rural residents largely lagged behind those enjoyed by urban residents in the planned economy era.

In the mid-to-late 1980s, market-oriented reforms on medical and health service system were successfully introduced but the access to this system was weakened at the same time. The market-oriented reforms resulted in even larger differences between urban and rural areas in access to medical and health services. During the reform period, a large number of people lost their medical insurance with the collapse of both state-owned enterprises and the people's communes. For instance, medical insurance coverage in rural areas decreased from 70% in 1981 to 20% in 1993 (Ramesh, Wu, & He, 2013; Yang et al., 2018). In the following decades, China began to launch a series of insurance schemes, such as the UEBMI, NRCMI, and “Urban Resident Basic Medical Insurance” (URBMI) (Zhou, Chen, & Chen, 2020). These schemes, however, still paid little attention to the equalization of the access to medical and health care between rural and urban residents (Yang et al., 2018).

A new round of reform on medical and health service system emerged after the SARS epidemic, and one of the key goals is the equalization of access to basic public health services between urban and rural residents. The “National Basic Public Health Service Program” (NBPHS) was issued by the “Ministry of Health” (MOH) in 2009 to mainly provide free basic public health services for urban and rural residents through primary medical and health institutions. The government increased the subsidies for these institutions from 19 billion Yuan (US $2.8 billion) in 2008 to 140 billion Yuan ($20.3 billion) in 2015 (Li et al., 2017), making basic public health services more accessible to urban and rural residents.

The migrants, however, have little access to these services neither in the destination cities under the restriction of the hukou system nor in their hometown due to long-term absence (Liang, 2016). Worse still, allied health services, such as occupational disease prevention and control, were not integrated into the basic health service system, resulting in poor utilization of these services by the migrants (Li et al., 2017). According to the data from CMDS 2013, the proportions of migrants with pension insurance coverage, WII prevention and control, were not integrated into the basic health service system, resulting in poor utilization of these services by the institutions.

EHFPSM is an important development of NBPHS to improve the access of migrant groups to public health and family planning services that are not fully covered by the previous programs. Besides, based on the features and specific needs of the migrants, EHFPSM attaches great importance to the measures such as establishment of EHRs, health education, care for pregnant/lying-in women and children, planned immunization, family planning, prevention and control of infectious diseases. Table 1 demonstrates a comprehensive comparison of NRCMI, NBPHS and EHFPSM.

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6 The key projects of NBPHS are as follows: (1) establishment of EHRs; (2) health education; (3) preventive vaccination; (4) prevention and treatment of infectious diseases; (5) child health care; (6) maternal health care; (7) elderly health care; (8) chronic disease management; and (9) severe mental illness management.

6 The internal migrants in China are usually characterized by two distinct features: (1) since most of them are relatively young and in the stage of fertility, they are overall quite healthy but lack of health consciousness; and (2) they flow frequently, and mostly live and work under poor conditions.
Table 1
Comparison among NRCMI, NBPHS and EHFPSM.

| Program         | NRCMI                                      | NBPHS                                      | EHFPSM                                      |
|-----------------|--------------------------------------------|--------------------------------------------|---------------------------------------------|
| Implementation  | Officially launched in 2003, expanded      | Officially launched in 2009, nationwide     | Implemented in 2013 among 40 pilot cities,   |
|                 | nationwide by 2009, administered by MOH.    | coverage every year, administered by MOH.  | gradually expanded to nationwide            |
| Operation period and program goal | Reducing the disease burden of illness; improving rural residents’ health and defending against medical expense risk. | Health promotion before illness; providing health public service, preventing and controlling major infectious diseases and chronic diseases, increasing emergency response capacity of public health emergencies. | Health promotion before illness; improving accessibility and supply of basic public services, preventing and controlling major infectious diseases and chronic diseases. |
| Eligibility conditions | All rural residents; voluntary enrollment. | All urban and rural residents, mainly the permanently registered residents; voluntary enrollment. | Internal migrants, including rural hukou migrants and urban hukou migrants; voluntary enrollment. |
| Financing level | Financed by government subsidies with individual contribution. | Financed by government subsidies, free for eligibility people. | Financed by government subsidies, free for eligibility people. |
| Service scope | Reimbursement mainly covering hospital care and catastrophic illness. | Mainly providing basic public health service. | Mainly providing basic public health and family planning service, and free treatment of infectious diseases. |

Note: The information of NBPHS and EHFPSM was sorted out by the authors, and that of NRCMI was mainly derived from Qin et al. (2014).

3. Methodology and data

3.1. Identification strategy

The impacts of EHFPSM implementation on the migrants’ basic public health service coverage, health status and medical service utilization can be evaluated according to the differences in health outcomes between the migrants in the pilot cities (treated group) and those who are supposed to be not in these pilot cities (counterfactual control group). Since the health outcomes of the latter samples could not be directly observed, we obtain them from the non-pilot cities under a random assignment. Although EHFPSM implementation is considered as exogenous, it can be expected that there may be systematic differences between migrants in pilot and non-pilot cities because of the non-random destination selection of the sample. Besides, the sample grouping methods of PSM can better mitigate this self-selection bias (Perreira & Pedroza, 2019).

First, the PSM technique is utilized to obtain the matched control group with observable characteristics. In the empirical analysis, we employ a logit regression to estimate the selection model of flow destinations as Eq. (1). The dependent variable is a dummy variable for whether migrant $i$ has flowed into the pilot city. The covariates include individual-level pre-determined variables and the city-level indicators measured at the pre-treatment period.

\[
\text{Prob}(Treated_{i|t}) = G(\text{city vars}_{t−1}, \text{individual vars}_{i})
\]  

(1)

Subsequently, the DID method was employed to identify the impact of the EHFPSM. After obtaining a matched control group with the technique of PSM, the impact of EHFPSM on migrants could be empirically studied by the following model shown as Eq. (2):

\[
\text{Prob}(\text{Outcome}_{i|t} = 1) = \alpha_0 + \alpha_T \text{Treated}_{i|t} + \alpha_Y \text{Treated}_{i|t} * \text{Post}_{i|t} + \alpha_X \text{X}_{i|t} + \delta_p + \gamma_i + \varepsilon_i
\]  

(2)

In the equation, the outcome variables (Outcome$_{i|t}$) include dummies for basic public health service coverage, health status, and medical service utilization of migrant $i$ in city $c$ of province $p$ at year $t$. The term Treated$_{i|t}$ denotes the dummy for whether city $c$ into which migrant $i$ flows is one of the pilot cities of EHFPSM. The covariates include individual-level, household-level and city-level controls discussed below, province fixed effects and year fixed effects.

The coefficient $\alpha_T$ captures the short-term effects of EHFPSM implementation on internal migrants, and the estimation is based on the differences in before-after changes of outcomes between the treated group and the matched control group simultaneously. All the standard errors are clustered at the city level.

3.2. Measurement of dependent variables, potential channels and control variables

The data of CMDS in 2013 and 2014 provide substantial items for this research. The dependent variables include three types of indicators: (1) the basic public health service coverage, which is measured as EHRs coverage, is a dummy for whether EHRs in the destination cities are established ($1 = \text{yes}, 0 = \text{no}$); (2) health status, which is represented by the one-year prevalence, is a dummy for whether the migrants have suffered from prevalence (injury) or physical discomfort in the last year ($1 = \text{yes}, 0 = \text{no}$), which is a negative indicator of health; and (3) medical service utilization, which is measured as the reimbursement in the last inpatient visit, is a dummy for whether the medical expense for the last inpatient visit has been reimbursed ($1 = \text{yes}, 0 = \text{no}$).

We propose the following three hypotheses for the impacts of EHFPSM implementation on internal migrants. (1) EHFPSM has a positive effect on the probability of EHRs coverage ($1 = \text{yes}$) for migrants because it is the major goal. (2) EHFPSM has a negative impact on the probability of the migrants’ prevalence in the last year ($1 = \text{yes}$), because it is also one major goal of the program. (3)
EHFPSM has a positive effect on the reimbursement of the last inpatient visit (1 = yes), which is a spillover effect because EHFPSM enhances the migrants better utilize the medical service when they have an inpatient visit, instead of directly providing reimbursement for them.

The potential channels are as follows: (1) Policy cognition channel, which is measured as the awareness of EHRs, a dummy for whether the migrants have heard of the EHRs in the destination cities (1 = yes, 0 = no); (2) medical insurance coverage channel, which is represented by UEBMI coverage, a dummy for whether the migrants have an UEBMI (1 = yes, 0 = no); and (3) WII coverage channel, which is measured as WII coverage, a dummy for whether the migrants have a WII (1 = yes, 0 = no).

We control a variety of variables to mitigate the possible spurious correlation as follows. The individual-level variables include age, the square of age, and dummies for gender, Han nationality, education, and married. The household-level variables comprise household scale and household income per capita in the cities. The logarithm form of household income per capita is taken. The city-level variables include GDP per capita and population density, all of which are taken with logarithm form; besides, the location fixed effects of residing province are included.

3.3. Dataset

The major data of this study are derived from CMDS in 2013 and 2014 and China City Statistics Yearbook (2013–2014). The CMDS survey is conducted by the China Population and Development Research Center and commissionned by the NHFPC. The CMDS utilizes a stratified, multi-stage and scale-oriented PPS sampling method, which covers 31 provinces and the Xinjiang Production and Construction Corps, and is conducted in May and June every year. The responders are migrants without local urban hukou but having lived in destination cities for more than one month. Moreover, the CMDS in 2013 and 2014 is chosen for this study to ensure the consistency of the samples and variables. Besides, the economic indicators of more than 300 prefecture-level cities in 2012 and 2013 are derived from China City Statistics Yearbook (2013–2014).

We combine the statistical data of prefecture-level cities with migrants’ individual-level data. To be more precise, we limit the living time of the migrants in the destination cities to no less than six months. Then, to reduce the possible influence of unobservable factors arising from the difference between cities, only the cities appeared in both 2013 and 2014 survey are chosen as the sample cities. Besides, abnormal samples are excluded by discarding the individual samples with income lower than the 1st percentile or higher than the 99th percentile. Ultimately, the sample size in this study is approximately 390, 000 migrants, covering 311 prefecture-level cities (more than 90% of China’s prefecture-level cities).

3.4. Summary statistics

Table 2 presents the summary statistics for the overall samples and the classification of samples by year and treatment. It shows the sample means and standard deviations of the variables of basic public health service coverage, health status, and medical service utilization, potential channels, individual-level characteristics, household-level characteristics, and city-level characteristics.

Overall, the treated samples tend to have an urban hukou, to be male, to be younger, to be married, and to have a relatively higher level of education compared with the control groups. Besides, the basic public health service coverage, health status, and medical service utilization (represented by EHRs coverage, one-year prevalence and reimbursement in the last inpatient visit) of the control groups and treated groups have been improved substantially, particularly those of the treated group. For example, the ratio of reimbursement in the last inpatient visit of the treated group increases from 50.6% in 2013 to 70.7% in 2014, and that of the control group rises from 52.5% to 68% as well. Another example is the EHRs coverage. The ratio of EHRs coverage of the treated group increases from 31.5% to 33.9%, while that of the control group shows a decreasing trend. Contrarily to the latter, the awareness ratio of EHRs of the treated group rises from 52.5% to 68% as well. Another example is the EHRs coverage. The ratio of EHRs coverage of the treated group increases from 60.7% to 61.4%. Considering the difference in sample scale between 2013 and 2014, the endogeneity of self-selection should be tackled before estimation.

4. Empirical results and discussion

4.1. Flow destination selection estimated by PSM technique

In this part, referring to Dai and Wang (2019) and Ma and Nolan (2017), we employ the PSM technique to obtain the matched control group by observable characteristics. We first estimate the propensity score, that is, the probability of the flow of the migrants to the pilot cities, with a logit model shown as Eq. (1). The dependent variable of “treated” is a dummy for whether a migrant has been in the pilot city. The observable pre-determined characteristics include individual characteristics, as well as the city-level population density measured at the pre-treatment period and the fixed effects of the home province and residing province.

Fig. 1 shows that the migrants with an urban hukou, male, relatively high level of education, and Han nationality and married have a higher probability of flowing into the pilot cities. Besides, migrants tend to flow into the pilot cities with higher population density. Results suggest that there are great differences in observable characteristics between migrants in the pilot and non-pilot cities, which should be addressed before estimating the impact of EHFPSM.

7 For a detailed description of sampling methods and data of CMDS surveys, see Huang, Liu, Xue, Li, and Shi (2018), and (Lu, Chen, & Wang, 2019).
### Table 2
Summary statistics.

|                          | Overall   | 2013       | 2014       |
|--------------------------|-----------|------------|------------|
|                          | Control group | Treated group | Control group | Treated group |
| Health basic public service coverage, health status, and medical service utilization | | | |
| EHRs coverage (1 = yes, 0 = no) | 0.310 (0.463) | 0.315 (0.465) | 0.315 (0.465) | 0.276 (0.447) | 0.339 (0.473) |
| One-year prevalence (1 = yes, 0 = no) | 0.070 (0.256) | 0.098 (0.297) | 0.111 (0.314) | 0.038 (0.192) | 0.038 (0.191) |
| Reimbursement in the last inpatient visit (1 = yes, 0 = no) | 0.610 (0.488) | 0.525 (0.5) | 0.506 (0.5) | 0.680 (0.467) | 0.707 (0.456) |
| Potential channels | | | |
| Awareness of EHRs (1 = yes, 0 = no) | 0.619 (0.486) | 0.607 (0.488) | 0.602 (0.49) | 0.614 (0.487) | 0.654 (0.476) |
| UEBMI coverage (1 = yes, 0 = no) | 0.175 (0.380) | 0.112 (0.315) | 0.224 (0.417) | 0.123 (0.329) | 0.259 (0.438) |
| WII coverage (1 = yes, 0 = no) | 0.187 (0.390) | 0.161 (0.368) | 0.229 (0.42) | 0.138 (0.344) | 0.234 (0.424) |
| Individual characteristics | | | |
| Hukou (1 = urban hukou, 0 = rural hukou) | 0.158 (0.365) | 0.143 (0.35) | 0.163 (0.37) | 0.150 (0.357) | 0.180 (0.384) |
| Male (1 = male, 0 = female) | 0.555 (0.497) | 0.538 (0.499) | 0.519 (0.5) | 0.583 (0.493) | 0.575 (0.499) |
| Age (year old) | 34.361 (9.074) | 34.425 (9.044) | 34.062 (8.915) | 34.676 (9.265) | 34.217 (9.028) |
| Education (1 = illiterate, 7 = master) | 3.352 (0.971) | 3.270 (0.893) | 3.362 (0.985) | 3.327 (0.951) | 3.463 (1.053) |
| NRCMI (1 = yes, 0 = no) | 0.682 (0.466) | 0.727 (0.446) | 0.663 (0.473) | 0.723 (0.447) | 0.604 (0.489) |
| Han nationality (1 = Han, 0 = non-Han) | 0.945 (0.228) | 0.932 (0.252) | 0.963 (0.19) | 0.932 (0.253) | 0.959 (0.198) |
| Married (1 = yes, 0 = no) | 0.791 (0.406) | 0.790 (0.407) | 0.797 (0.402) | 0.789 (0.408) | 0.790 (0.407) |
| Household characteristics | | | |
| Household scale (persons) | 2.612 (1.148) | 2.606 (1.163) | 2.568 (1.12) | 2.662 (1.167) | 2.605 (1.131) |
| Household income per capita (Yuan) (log) | 7.605 (0.557) | 7.496 (0.559) | 7.658 (0.539) | 7.553 (0.539) | 7.739 (0.537) |
| City characteristics | | | |
| GDP per capita (Yuan) (log) | 11.146 (0.422) | 10.917 (0.45) | 11.251 (0.262) | 11.079 (0.493) | 11.379 (0.225) |
| Population density (persons / km-squared) (log) | 6.784 (0.779) | 6.548 (0.872) | 7.108 (0.506) | 6.488 (0.842) | 7.078 (0.548) |
| Observation | 302,251 (302,251) | 81,022 (81,022) | 68,088 (68,088) | 81,394 (81,394) | 71,747 (71,747) |

*Note:* (1) Statistics shown are sample means and standard deviations. (2) The summary results of education dummies (illiterate, primary school, ... master degree) are not reported in the above table, and the information is available upon request. (3) Household income per capita, which measures the migrants’ household monthly income per capita.

Then, we obtain the matched control group by matching the treated group and control groups based on the propensity score. A one-to-one matching technique without replacement is employed for the nearest-neighbor PSM and MDM algorithm. To satisfy the common support condition (CSC), we exclude the treated samples whose propensity scores are higher than the maximum or lower than the minimum propensity score of the potential control group.

To assess the matching quality, we compare the treated group and the control group before and after the matching. Table A.1 shows the balance test of the covariates before and after PSM. The standardized biases are largely reduced, and all of the selection bias is lower than 10%, suggesting that the selection biases are effectively eliminated by the matching (Dai & Wang, 2019). Besides, Fig. 2 shows that the matching removes the significant differences in the kernel density of the propensity scores between the treated group and matched control group. Overall, the matching procedure is valid and covariates of the treated group and the matched control group balance.

#### 4.2. Overall treatment effects of the EHFPSM program

Table 3 presents the effects of EHFPSM on migrants’ basic public health service coverage, health status and medical service utilization, and is the estimation results of Eq. (2) by the logit model with PSM and DID method. Columns (1), (3) and (5) control the province fixed effect, and columns (2), (4) and (6) control the individual characteristics, household characteristics, city
We first investigate the associations of EHFPSM with the migrants' basic public health service coverage as well as their health status. The dependent variable (EHRs coverage) of columns (1)–(2) in Table 3 is a dummy for whether EHRs has been established for a migrant. The results show that the EHFPSM has significantly increased the probability of EHRs coverage, and significantly improved the migrants' access to basic public health service. Besides, dependent variable (one-year prevalence) of Columns (3)–(4) is a negative indicator of health status. The results show that the policy has significantly decreased the probability of migrants' one-year prevalence.

We further examine the spillover effect of EHFPSM on medical service utilization of migrants in columns (5)–(6). As mentioned in the hypotheses in Section 3.2, EHFPSM does not directly provide any reimbursement for migrants. In facts, it promotes the migrants to take better advantages of medical service policies for reimbursement when they have an inpatient visit. The policy has significantly increased the probability of reimbursement in the last inpatient visit, as well as improved the medical service utilization of the migrants.

Since the coefficients in Table 3 cannot directly reveal the magnitude of the effect of EHFPSM on migrants, we then report their marginal effects in Table 4. All the empirical specifications in Table 4 are consistent with those in Table 3. Column (2) shows that when the values of the control variables are kept unchanged, EHFPSM significantly increases the probability of EHRs coverage by 6.9%. Column (4) reports that EHFPSM contributes to a 1.2% reduction in the probability of the one-year prevalence. Column (6) demonstrates that EHFPSM contributes to a 7.2% increase in the probability of reimbursement in the last inpatient visit of internal migrants.
Table 3  
Effects of EHFPSM on the basic public health service coverage, health status and medical service utilization of internal migrants.

|                           | EHRs coverage | One-year prevalence | Reimbursement in the last inpatient visit |
|---------------------------|---------------|---------------------|------------------------------------------|
|                           | (1)           | (2)                | (3)                                      |
|                           | (4)           | (5)                | (6)                                      |
| Treated*Post              | 0.355**       | 0.371**             | -0.174*                                  |
|                           | (0.159)       | (0.159)             | (0.104)                                  |
|                           | -0.185*       | 0.024*              | -0.018*                                  |
|                           | (0.107)       | (0.141)             | (0.158)                                  |
| Treated                   | 0.168 (0.131) | 0.184 (0.157)       | 0.232**                                  |
|                           |               | (0.076)             | (0.096)                                  |
| Male                      | 0.080*        | 0.058*              | 0.026                                   |
|                           | (0.040)       | (0.027)             | (0.136)                                  |
| Age                       | -0.180***     | -0.521***           | 0.000                                   |
|                           | (0.021)       | (0.039)             | (0.104)                                  |
| Age-squared               | -0.000        | 0.001***            | -0.001                                  |
|                           | (0.000)       | (0.000)             | (0.001)                                  |
| Primary school            | 0.051         | -0.071              | 0.385                                   |
|                           | (0.104)       | (0.056)             | (0.242)                                  |
| Junior high school        | 0.163         | -0.261**            | 0.510                                   |
|                           | (0.106)       | (0.051)             | (0.264)                                  |
| Senior high school        | 0.276**       | -0.167***           | 0.744                                   |
|                           | (0.109)       | (0.058)             | (0.277)                                  |
| Junior college            | 0.325***      | 0.083               | 1.145                                   |
|                           | (0.121)       | (0.074)             | (0.371)                                  |
| Bachelor degree           | 0.386***      | 0.200***            | 1.391                                   |
|                           | (0.126)       | (0.097)             | (0.432)                                  |
| Master degree             | 0.326*        | 0.292*              | 1.798                                   |
| Han nationality           | -0.065        | -0.151***           | 0.120                                   |
|                           | (0.052)       | (0.035)             | (0.191)                                  |
| Married                   | 0.186***      | 0.567***            | -0.013                                  |
|                           | (0.041)       | (0.054)             | (0.197)                                  |
| Household scale           | 0.027*        | 0.066***            | -0.039                                  |
|                           | (0.015)       | (0.012)             | (0.044)                                  |
| Household income per capita| 0.011 (0.031) | -0.100***           | 0.023                                   |
| GDP per capita (t-1) (log) | 0.163         | -0.038              | 0.359                                   |
|                          | (0.164)       | (0.075)             | (0.184)                                  |
| Population density(t-1) (log) | -0.134 (0.087) | -0.155***           | 0.015                                   |
|                          | (city level)  | (0.045)             | (0.100)                                  |

Note: (1) The dependent variables of “EHRs coverage”, “One-year prevalence”, and “Reimbursement in the last inpatient visit” are dummies (1 = yes, 0 = no). (2) The table reports the results of logit regression. (3) Standard errors are corrected for clustering at the city level and displayed in parentheses below all coefficients. (4) ***, **, * denote the 1%, 5% and 10% significance levels, respectively.

Table 4  
Marginal effects of EHFPSM on the internal migrants’ basic public health service coverage, health status and medical service utilization.

|                           | EHRs coverage | One-year prevalence | Reimbursement in the last inpatient visit |
|---------------------------|---------------|---------------------|------------------------------------------|
|                           | (1)           | (2)                | (3)                                      |
|                           | (4)           | (5)                | (6)                                      |
| Treated*Post              | 0.067**       | 0.069**             | -0.011*                                  |
|                           | (0.030)       | (0.030)             | (0.007)                                  |
|                           | -0.012*       | 0.076*              | 0.072*                                   |
|                           | (0.007)       | (0.007)             | (0.043)                                  |
| Treated                   | 0.032         | 0.034               | 0.005                                    |
|                           | (0.025)       | (0.029)             | (0.005)                                  |
| Individual characteristics| No            | Yes                 | No                                       |
| Household characteristics  | No            | Yes                 | No                                       |
| City characteristics      | No            | Yes                 | No                                       |
| Province fixed effects    | Yes           | Yes                 | Yes                                      |
| Year fixed effects        | Yes           | Yes                 | Yes                                      |

Note: (1) The dependent variables of “EHRs coverage”, “One-year prevalence”, and “Reimbursement in the last inpatient visit” are dummies (1 = yes, 0 = no). (2) The table reports the marginal effects of logit regressions. (3) Standard errors are corrected for clustering at the city level and displayed in parentheses below all coefficients. (4) ***, **, * denote the 1%, 5% and 10% significance levels, respectively.

4.3. Test of the underlying mechanism

In this subsection, we examine three important underlying channels through which EHFPSM affects internal migrants’ basic public health service coverage, health status and medical service utilization. We assume that EHFPSM strengthens the migrants’ awareness of EHRs, as well as increases their UEBMI coverage and WII coverage. We employ the PSM-DID method to test the underlying mechanisms. Definitions and measurements of the three channel indicators are shown in Section 3.2.

Table 5 demonstrates the marginal effects of EHFPSM on the awareness of EHRs, UEBMI coverage, and WII coverage of migrants, and each column in the table corresponds to a separate regression. Columns (1)–(2) check the channel of enhancing understanding of the policies. The coefficient of the interaction term (Treated * Post) in column (2) is positive and statistically significant, suggesting that EHFPSM has increased the EHRs awareness of migrants by 4.2%. This mechanism brings about the positive effects in two aspects: (1) EHFPSM providers convey more health promotion information to the migrants to increase their EHRs coverage and health
cognition, which coincides with the result of Carpenter and Lawler (2019); (2) EHFPSM promotes the migrants to contact with the providers, which in turn increases the medical service utilization of migrants.

Columns (3)–(6) in Table 5 show that both UEBMI coverage and WII coverage are the social insurance channels for EHFPSM to affect the migrants’ welfare. The coefficient of the interaction term in column (4) is positive and statistically significant, suggesting that EHFPSM has increased the UEBMI coverage by 1.7%. Column (6) shows that EHFPSM has increased the migrants’ WII coverage by 2%. These mechanisms bring about positive effects in two aspects: (1) EHFPSM prompts the migrants to participate in formal labor markets and further facilitates their better utilization of medical service; (2) EHFPSM promotes the social integration of the migrants into the destination cities and then improves their health status.

4.4. Heterogeneous effects of EHFPSM

We have previously provided the estimation results of the impact of EHFPSM on basic public health service coverage, health status and medical service utilization of migrants. However, it remains unclear whether there are any differences in the impact of EHFPSM on different subgroups. Answering this question may help to understand the equalization effect of EHFPSM. We further explore the heterogeneous effect of EHFPSM implementation on different subgroups, and the results are shown as marginal effects.

Table 5
Underlying channels for the effects of EHFPSM on internal migrants: marginal effect.

| Awareness of EHRs | UEBMI coverage | WII coverage |
|-------------------|----------------|--------------|
|                   | (1)            | (2)          | (3)          | (4)          | (5)          | (6)          |
| Treated*Post      | 0.040*         | 0.042*       | 0.017*       | 0.017*       | 0.028***     | 0.020***     |
|                   | (0.023)        | (0.024)      | (0.010)      | (0.009)      | (0.010)      | (0.009)      |
| Treated           | 0.033          | 0.007        | 0.069***     | 0.049***     | 0.026        | 0.038***     |
|                   | (0.025)        | (0.027)      | (0.019)      | (0.019)      | (0.016)      | (0.015)      |
| Individual        |               |              |              |              |              |              |
| characteristics   | No             | Yes          | No            | Yes          | No            | Yes          |
| Household         | No             | Yes          | No            | Yes          | No            | Yes          |
| characteristics   | No             | Yes          | No            | Yes          | No            | Yes          |
| City characteristics | Yes         | Yes          | Yes           | Yes          | Yes          | Yes          |
| Province fixed    | Yes            | Yes          | Yes           | Yes          | Yes          | Yes          |
| effects           |                |              |               |              |              |              |
| Year fixed        | Yes            | Yes          | Yes           | Yes          | Yes          | Yes          |
| effects           |                |              |               |              |              |              |
| Observations      | 178,244        | 174,999      | 229,615       | 225,491      | 224,263      | 220,310      |

Note: (1) The dependent variables of “Awareness of EHRs”, “UEBMI coverage”, and “WII coverage” are dummies (1 = yes, 0 = no). (2) The table reports the marginal effects of logit regressions. (3) Standard errors are corrected for clustering at the city level and displayed in parentheses below all coefficients. (4) ***, **, * denote the 1%, 5% and 10% significance levels, respectively.

Table 6
Heterogeneous effects of EHFPSM by individual hukou, education level, and gender: marginal effect.

| EHRs coverage | One-year prevalence | Reimbursement in the last inpatient visit |
|---------------|---------------------|------------------------------------------|
|              | (1)                | (2)                                      | (3)                                      |
|               | (4)                | (5)                                      | (6)                                      |
|               | (7)                | (8)                                      | (9)                                      |
| Treated*Post  | 0.046*             | 0.045*                                   | −0.063***                                |
|               | (0.024)            | (0.027)                                  | (0.022)                                  |
| Treated*Post*Hukou | −0.001        | 0.006                                   | 0.006                                    |
|               | (0.029)            | (0.004)                                  | (0.002)                                  |
| Hukou         | 0.029***           | 0.006***                                 | 0.006***                                 |
|               | (0.008)            | (0.002)                                  | (0.002)                                  |
| Treated*Post*Edu | 0.023***         | 0.021***                                | 0.021***                                 |
|               | (0.007)            | (0.002)                                  | (0.002)                                  |
| Edu (1 = high, 0 = low) | 0.004**           | −0.063***                               | −0.063***                                |
|               | (0.008)            | (0.009)                                  | (0.008)                                  |
| Treated*Post*Male | −0.004          | −0.034***                               | −0.034***                                |
|               | (0.008)            | (0.005)                                  | (0.002)                                  |
| Male          | −0.004             | −0.063***                               | −0.063***                                |
|               | (0.008)            | (0.009)                                  | (0.008)                                  |
| Province fixed | Yes                | Yes                                    | Yes                                      |
| effects       | Yes                | Yes                                    | Yes                                      |
| Year fixed    | Yes                | Yes                                    | Yes                                      |
| effects       | Yes                | Yes                                    | Yes                                      |
| Observations  | 178,244            | 178,244                                 | 2345                                     |

Note: (1) The dependent variables are dummies (1 = yes, 0 = no). (2) The table reports the marginal effects of logit regressions. (3) “Edu” is measured as a dummy (1 = high-education, 0 = low-education), where “low-education” migrants represent those with a junior high school education or below, and “high-education” migrants represent those with a senior high school education or above. (4) Standard errors are corrected for clustering at the city level and displayed in parentheses. (5) ***, **, * denote the 1%, 5% and 10% significance levels, respectively.
Table 6 reports the heterogeneous effects of EHFPSM in terms of individual hukou, education level, and gender. Compared with their counterparts, migrants who are less-educated or male suffer less from one-year prevalence, and urban hukou migrants receive a higher probability of reimbursement. In column (1), the coefficient of our interested interaction term is negative. The result reveals that the effect of EHFPSM on the EHRs coverage of urban hukou migrants is not more significant in magnitude than that of rural hukou migrants. One possibility is that neither the urban hukou migrants nor the rural hukou migrants can take the medical insurance with them to the destination cities (Cheng, Nielsen, & Smyth, 2014). Besides, in columns (2)–(3), the coefficients of our interested interaction terms are insignificant.

Columns (4)–(6) show the heterogeneous effects of EHFPSM on one-year prevalence of subgroups. The coefficient of the interaction term in column (4) is insignificant, while that in column (5) is positive and statistically significant, revealing that EHFPSM has significantly reduced the probability of one-year prevalence for less-education migrants by 7%, and decreased that for high-education migrants by 4.9% (\(= -0.070 + 0.021\)). The coefficient of the interaction term in column (6) is negative and statistically significant, suggesting that EHFPSM has a more significant reduction effect on the probability of one-year prevalence for male migrants than that for female migrants.

Columns (7)–(9) show the heterogeneous effects of EHFPSM on medical service utilization of different subgroups. In column (7), the coefficient of the interaction term is positive and statistically significant. The result suggests that EHFPSM has increased the probability of reimbursement in the last inpatient visit for rural hukou migrants by 14.8%, and more significantly enhanced that for urban hukou migrants by 35.3% (\(= 0.148 + 0.205\)). Besides, in columns (8)–(9), the coefficients of our interested interaction terms are insignificant.

5. Robustness test

5.1. Additional control of NRCMI and city-level labor market conditions

To clarify whether the improvement of migrants' health status and medical service utilization is associated with other social security programs (such as NRCMI) or city-level labor market conditions, we control the effects of these social security programs and then check the robustness. Following the previous research (Du, Xu, & Wu, 2018), we employ the sampling survey data from 1% China Census in 2005 to construct the indicators of labor market conditions in the pre-treatment period: “city-level pension insurance ratio” and “city-level medical insurance ratio”. In general, higher values of these indicators represent higher standardization degrees of the labor market.

First, we control the potential confounders of NRCMI in columns (1)–(3) of Table 7. Column (1) shows that EHFPSM increases the odds of EHRs coverage of the migrants by 41.9% (\(= \exp(0.350) - 1\)), while NRCMI reduces the odds by 9.1% (\(= 1 - \exp(-0.095)\)). Column (2) shows that EHFPSM decreases the odds of one-year prevalence by 16.1% (\(= 1 - \exp(-0.175)\)). Column (3) displays that EHFPSM increases the odds of reimbursement in the last inpatient visit by 41.5% (\(= \exp(0.347) - 1\)).

Second, we control the confounders of city-level labor market conditions, and the results are shown in columns (4)–(6) of Table 7. Column (4) shows that EHFPSM increases the odds of EHRs coverage by 41.2% (\(= \exp(0.345) - 1\)). Besides, the coefficient of “city-

Table 7

|                      | EHRs coverage | One-year prevalence | Reimbursement in the last inpatient visit | EHRs coverage | One-year prevalence | Reimbursement in the last inpatient visit |
|----------------------|---------------|---------------------|------------------------------------------|---------------|---------------------|------------------------------------------|
|                      | (1)           | (2)                 | (3)                                      | (4)           | (5)                 | (6)                                      |
| Treated*Post         | 0.350**       | -0.175*             | 0.347*                                   | 0.345**       | -0.172*             | 0.314*                                   |
| (0.159)              | (0.105)       | (0.188)             | (0.159)                                  | (0.104)       | (0.188)             |                                         |
| Treated              | 0.166         | 0.083               | 0.030                                    | 0.154         | 0.144               | -0.040                                   |
| (0.131)              | (0.076)       | (0.141)             | (0.146)                                  | (0.077)       | (0.148)             |                                         |
| NRCMI                | -0.095***     | -0.025              | 0.209**                                  |               |                     |                                         |
| (0.035)              | (0.031)       | (0.105)             |                                         |               |                     |                                         |
| City-level pension insurance ratio (%) |               |                     |                                          | -0.024**      | -0.007              | -0.001                                   |
| (0.011)              |               |                     |                                          | (0.007)       | (0.013)             |                                         |
| City-level medical insurance ratio (%) |               |                     |                                          | 0.022***      | -0.003              | 0.015                                    |
| (0.011)              |               |                     |                                          | (0.005)       | (0.012)             |                                         |
| Constant             | -2.048***     | -2.226***           | -0.443                                   | -2.433***     | -1.927***           | -0.794**                                 |
| (0.127)              | (0.117)       | (0.293)             | (0.300)                                  | (0.159)       | (0.344)             |                                         |
| Province fixed effects | Yes           | Yes                 | Yes                                      | Yes           | Yes                 | Yes                                      |
| Year fixed effects   | Yes           | Yes                 | Yes                                      | Yes           | Yes                 | Yes                                      |
| Observations         | 178,244       | 292,617             | 2345                                     | 178,244       | 292,617             | 2345                                     |
| Pseudo R-squared     | 0.082         | 0.045               | 0.043                                    | 0.084         | 0.046               | 0.043                                    |

Note: (1) All the dependent variables are dummies (1 = yes, 0 = no). (2) Data of city-level pension and medical insurance ratio come from the sampling survey data from 1% China Census in 2005. (3) The table reports the estimation results of logit regressions. (4) Standard errors are corrected for clustering at the city level and displayed in parentheses below all coefficients. (5) ***, **, * denote the 1%, 5% and 10% significance levels, respectively.
level medical insurance ratio” is positive and statistically significant, suggesting that higher labor market standardization means a higher average ratio of EHRs coverage for migrants. Column (5) demonstrates that EHFPSM reduces the odds of one-year prevalence, while the coefficients of city-level labor market conditions are insignificant. Column (6) demonstrates that EHFPSM enhances the probability of reimbursement in the last inpatient visit. To sum up, when controlling the NRCMI and city-level labor market conditions, the results in Table 7 are consistent with those in Table 3.

5.2. Replacement of dependent variables

To address the concerns about measurement errors of variables, some robustness checks are carried out by replacing the dependent variables with broad definition of EHRs coverage, broad definition of awareness of EHRs, and whether having a child born in the destination city (only for married samples). Table 8 shows the robustness test results of replacement of dependent variables. Columns (1)–(2) show that the coefficients of key interests are similar in magnitude to those in Table 3. Besides, column (3) reveals that EHFPSM significantly increases the odds of having children born in the destination cities. To sum up, the robustness checks suggest that our dependent variables are robust and reliable.

5.3. Robustness test with different PSM techniques

We examine the robustness of PSM by employing different matching techniques. First, propensity score is estimated according to Eq. (1), and both matching methods of radius and kernel are utilized to obtain the treated group and the matched control group.

| Table 8 | Robustness test: replacement of dependent variables. |
|---------|-----------------------------------------------------|
| Awareness of EHRs: broad definition | Establishment of EHRs: broad definition | Whether having a child born in the destination city |
| (1) | (2) | (3) |
| Treated*Post | 0.163* | 0.353** | 0.071* |
| (0.097) | (0.155) | (0.042) |
| Treated | 0.065 | 0.129 | −0.003 |
| (0.094) | (0.124) | (0.046) |
| Constant | −0.694*** | −2.364*** | −0.540*** |
| (0.095) | (0.120) | (0.064) |
| Province fixed effects | Yes | Yes | Yes |
| Year fixed effects | Yes | Yes | Yes |
| Observations | 232,119 | 232,119 | 176,937 |
| Pseudo R-squared | 0.051 | 0.075 | 0.021 |

Note: (1) All the dependent variables are dummies (1 = yes, 0 = no). The broad definition widens the sample size, meaning that a migrant who answers “unclear” to the question “have you established a EHRs in the destination city” is considered as either never hearing of EHRs or not covered by EHRs. (2) The table reports the estimation results of logit regressions. (3) Standard errors are corrected for clustering at the city level and displayed in parentheses below all coefficients. (4) ***, **, * denote the 1%, 5% and 10% significance levels, respectively.

| Table 9 | Estimation results by combining different PSM techniques and DID. |
|---------|-----------------------------------------------------|
| PSM by radius matching | PSM by kernel matching |
| EHRs coverage | One-year prevalence | Reimbursement in the last inpatient visit | EHRs coverage | One-year prevalence | Reimbursement in the last inpatient visit |
| (1) | (2) | (3) | (4) | (5) | (6) |
| Treated*Post | 0.353** | −0.170* | 0.339* | 0.353** | −0.170* | 0.339* |
| (0.160) | (0.103) | (0.186) | (0.160) | (0.103) | (0.186) |
| Treated | 0.294** | 0.073 | 0.045 | 0.293** | 0.073 | 0.045 |
| (0.148) | (0.075) | (0.144) | (0.148) | (0.075) | (0.144) |
| Constant | −1.777*** | −2.229*** | −0.312 | −1.777*** | −2.229*** | −0.312 |
| (0.145) | (0.114) | (0.272) | (0.145) | (0.114) | (0.272) |
| Province fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 127,422 | 300,884 | 2419 | 127,425 | 300,890 | 2419 |
| Pseudo R-squared | 0.123 | 0.045 | 0.042 | 0.123 | 0.045 | 0.042 |

Note: (1) All the dependent variables are dummies (1 = yes, 0 = no). (2) The table reports the estimation results of logit regressions. (3) Standard errors are corrected for clustering at the city level and displayed in parentheses below all coefficients. (4) ***, **, * denote the 1%, 5% and 10% significance levels, respectively.
respectively. Then, we estimate the effects of EHFPSM on the migrants’ basic public health service coverage, health status, and medical service utilization by DID regressions. Overall, Table 9 shows that the coefficients are still significant and robust by combining different PSM techniques and DID.

6. Conclusion remarks

EHFPSM is a novel public health policy to improve access to basic public health and family planning services of internal migrants in China. However, research on the effects of the program and the potential mechanism is rather limited. With growing global connections and increasing concerns about public health emergencies, the health status of migrants have received great attention. Hence, a comprehensive evaluation of the effect of EHFPSM provides important implications for policy designers to improve the health status and social integration of the migrants in developing countries.

This study provides a comprehensive evaluation of the effects of the EHFPSM on internal migrants’ basic public health service coverage, health status and medical service utilization based on CMDS data and city-level statistic indicators. By combining the PSM–DID method and controlling for a variety of individual, household and city characteristics, we provide robust evidence that EHFPSM significantly increases the probability of electronic resident health records (EHRs) coverage by 6.9%, and decreases the probability of one-year prevalence by 1.2%. The spillover effect demonstrates that EHFPSM is associated with a 7.2% increase in the probability of reimbursement in the last inpatient visit. Furthermore, EHFPSM imposes its positive impacts on the health status and welfare of migrants through strengthening the awareness of EHRs, UEBMI coverage and WII coverage. Finally, EHFPSM brings about more significant decreases in disease prevalence for male and less-educated migrants, and higher reimbursement probability for urban hukou migrants.

Overall, three policy implications may be proposed from this study. (1) The policy design should focus not only on soft goals such as improving the basic public health service coverage of the migrants, but also on more critical goals such as promoting health equity for them. (2) Health education should be strengthened to improve the migrants’ health literacy, such as how to make proper utilization of social security policies to protect themselves. (3) More importance should be attached to the welfare improvement of vulnerable groups, such as rural and female migrants, to promote their equal access to basic public health service.

Table A.1
Balance test of the covariates before and after PSM.

| Variable          | Sample       | Mean   | Bias (%) | Reduction in bias (%) | t-test | p > |t|  |
|-------------------|--------------|--------|----------|-----------------------|--------|-----|---|---|
|                   | Treated      | Control|          |                       |        |     |   |   |
| Hukou             | Unmatched    | 0.132  | 0.132    | 0                     | 0.03   | 0.97|   |   |
|                   | Matched      | 0.132  | 0.145    | −3.8                  | −8.45  | 0.00|   |   |
|                   |              |        |          | −26,271.6             | 0.00   |     |   |   |
| Male              | Unmatched    | 0.551  | 0.553    | −0.3                  | −0.69  | 0.49|   |   |
|                   | Matched      | 0.551  | 0.547    | 0.9                   | 2.03   | 0.04|   |   |
|                   |              |        |          | −209.1                | 0.00   |     |   |   |
| Age               | Unmatched    | 34.600 | 34.950   | −3.8                  | −9.08  | 0.00|   |   |
|                   | Matched      | 34.600 | 34.520   | 0.8                   | 78.6   | 0.06|   |   |
|                   |              |        |          | 1.86                  | 0.00   |     |   |   |
| Age-squared       | Unmatched    | 1280   | 1309     | −4.2                  | −9.95  | 0.00|   |   |
|                   | Matched      | 1280   | 1278     | 0.3                   | 93.3   | 0.52|   |   |
|                   |              |        |          | 0.64                  | 0.00   |     |   |   |
| Primary school    | Unmatched    | 0.113  | 0.126    | −1.6                  | −9.06  | 0.00|   |   |
|                   | Matched      | 0.113  | 0.142    | −1.6                  | −132.5 | 0.00|   |   |
|                   |              |        |          | −19.57                | 0.00   |     |   |   |
| Junior high school| Unmatched    | 0.546  | 0.554    | −1.6                  | −3.90  | 0.00|   |   |
|                   | Matched      | 0.546  | 0.497    | 9.9                   | 503.7  | 0.00|   |   |
|                   |              |        |          | 22.36                 | 0.00   |     |   |   |
| Senior high school| Unmatched    | 0.219  | 0.213    | 1.6                   | 3.82   | 0.00|   |   |
|                   | Matched      | 0.219  | 0.225    | −1.4                  | 14.0   | 0.00|   |   |
|                   |              |        |          | −3.10                 | 0.00   |     |   |   |
| Junior college    | Unmatched    | 0.078  | 0.065    | 4.7                   | 11.35  | 0.00|   |   |
|                   | Matched      | 0.078  | 0.081    | −1.2                  | 75.0   | 0.00|   |   |
|                   |              |        |          | −2.57                 | 0.01   |     |   |   |
| Bachelor degree   | Unmatched    | 0.030  | 0.026    | 2.2                   | 5.27   | 0.00|   |   |
|                   | Matched      | 0.030  | 0.034    | −2.3                  | −6.0   | 0.00|   |   |
|                   |              |        |          | −5.00                 | 0.00   |     |   |   |
| Master degree     | Unmatched    | 0.002  | 0.001    | 1.6                   | 3.95   | 0.00|   |   |
|                   | Matched      | 0.002  | 0.002    | −0.9                  | 44.2   | 0.07|   |   |
|                   |              |        |          | −1.81                 | 0.00   |     |   |   |
| Han nationality   | Unmatched    | 0.960  | 0.929    | 13.5                  | 38.83  | 0.00|   |   |
|                   | Matched      | 0.960  | 0.946    | 6.3                   | 53.4   | 0.00|   |   |
|                   |              |        |          | 18.95                 | 0.00   |     |   |   |
| Married           | Unmatched    | 0.768  | 0.766    | 0.6                   | 1.41   | 0.16|   |   |
|                   | Matched      | 0.768  | 0.749    | 4.6                   | 671.5  | 0.00|   |   |
|                   |              |        |          | 10.27                 | 0.00   |     |   |   |
| NRCMI             | Unmatched    | 0.660  | 0.711    | −11.0                 | −26.31 | 0.00|   |   |
|                   | Matched      | 0.660  | 0.604    | 12.2                  | −10.6  | 0.00|   |   |
|                   |              |        |          | 26.63                 | 0.00   |     |   |   |
| Population density | (log)      | 7.071  | 6.601    | 80.2                  | 188.90 | 0.00|   |   |
|                   | Matched      | 7.071  | 7.134    | −10.7                 | 86.6   | 0.00|   |   |
|                   |              |        |          | −28.98                | 0.00   |     |   |   |

Note: the dependent variable is “Treated” (dummy for whether the migrant is in one of the pilot cities). The results of home and resident provinces dummies are not reported in the table, and the information is available on request.
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