Gender Differences in Health Insurance Coverage in China

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Research

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Abstract

**Background:** The Chinese government has been trying to build a universal public social health insurance (SHI) system since the early 2000s and has essentially achieved universal SHI coverage. By 2018, more than 97% of the entire Chinese population had SHI. However, there are still some obvious inequities in the SHI system.

**Methods:** based on three datasets, we first use statistical methods to identify gender differences in health insurance. Next, we construct a simple multiple regression model to capture the differences in insurance coverage across age groups using the parameter of interaction terms for gender and age groups.

**Results:** Based on data from a demographic survey that covers a large sample, we find that in the below 50 (in 2005) or 60 (in 2015) years age group, the coverage gap of urban employees' basic medical insurance (UEBMI) between men and women was relatively smaller, while a larger disparity existed in the above 50 (in 2005) or 60 (in 2015) group. Moreover, gender differences in health insurance were more pronounced in the low-education group, while no gender differences were found in the high-education group.

**Conclusions:** This paper explains the gender gap in health insurance and the reason for the wider gap among older people. Our study indicates that because the UEBMI in China mainly covers people with formal jobs, a lower labor participation rate (even much lower in formal jobs) of women has led to their greater difficulty in obtaining health insurance. Since the older women's greater difficulty in obtaining jobs or susceptibility to lay-offs during the period of the UEBMI's implementation, the possibility of being covered was even much lower. In fact, it was because of the combined effects of the UEBMI system and the labor market condition at that time that older women had a lower proportion of being covered under the UEBMI.

1. **Background**

The Chinese government has been trying to build a universal public social health insurance (SHI) system since the early 2000s, and has essentially achieved universal SHI coverage [1–4]. By 2018, more than 97% of the entire Chinese population had SHI [5]. However, obvious inequities remain in the insurance system [6–9]. The ambitious SHI initiative consists of three key programs: the Urban Employee Basic Medical Insurance (UEBMI) for the urban employed, initiated in 1998; the New Cooperative Medical Scheme (NCMS) for rural residents, established in 2003; and the Urban Resident Basic Medical Insurance (URBMI), covering urban residents without formal employment (including children, the elderly, and other unemployed), launched in 2007. While enrollment under the UEBMI is compulsory for urban employees, the NCMS and the URBMI are voluntary insurance programs. It is generally agreed that China should merge the three schemes into one universal and unified social medical insurance scheme [10–12].

The main differences among these major types of insurance relate to their financing and benefits. The UEBMI has the highest level of financing and benefits—significantly higher than those of the other two.
First, regarding the conditions for enrollment, the UEBMI is mainly available to people who are formally employed, and those who are unemployed or informally employed are mainly covered by the URBMI and the NRCM. Considering the generally low income of URBMI and NRCM enrollees, the central and local governments subsidize these groups of enrollees. Specifically, both the URBMI and NRCM are financed by individual contributions and subsidies from the central and local governments. The UEBMI is financed through enterprise and employee contributions. The premium rate is 8% of the annual payroll, of which 6% comes from the employer and 2%, from the employee. The annual per capita premium for the UEBMI in 2018 was 5,808.3 yuan, while that for the URBMI and NRCM was only 763.4 yuan [13]. In terms of reimbursement rates, the benefit package for the UEBMI includes inpatient and outpatient care, while for the URBMI reimbursements are for inpatient medical expenses only. Meanwhile, the annual reimbursement ceiling is six times of the average wage of employees in the city for the UEBMI and six times the disposable income of local residents for the URBMI [3]. Regarding the reimbursement ratio, Zhao et al. [14] found that the actual reimbursement ratio for the UEBMI was 75%, while that for the URBMI was 50%. In other words, the portion of the low-income population that is unemployed or informally employed bears more of the burden of health care costs, which clearly results in inequity in the distribution of medical resources due to inequitable health insurance [15–17]. Moreover, some studies have found that the type of the health insurance affects equity in the use of health care services, such that the use of health care services differs among residents covered by different insurance policies [18–21].

The root cause of the inequity in China's health insurance lies in the flawed system design of the UEBMI system reform. The UEBMI's features of being employment-based and not including other family members stems from the 1994 reform of the health insurance system [22]. Before the reform, the healthcare insurance system in the era of the planned economy consisted of labor insurance and public health services. Public health services were mainly provided to part of the government staffs, whereas labor insurance covered general enterprise employees and their family members. Nevertheless, since the economic reform that started in the 1980’s, such a system has been unable to adapt to economic development. On the one hand, faced with greater pressure from market competition and less government subsidies, many state-owned enterprises (SOEs) began to suffer losses and were no longer able to undertake the huge labor insurance burden. On the other hand, due to reasons such as the aging of the population and inflation, individual medical expenditures increased sharply and placed increasing pressure on enterprises, which provided the labor insurance. Moreover, under the old labor insurance system, numerous employees in the newly emerged individual and foreign-owned enterprises could not obtain medical insurance.

Therefore, in 1994 China initiated the reform of the medical insurance system by implementing an SHI system compatible with the market economy—the UEBMI system. After several years of pilot work in Zhenjiang (Jiangsu province) and Jiujiang (Jiangxi province), this system was ultimately carried out nationwide in 1998. The UEBMI mainly covers the employed (excluding family members). Compared with the labor insurance system, the biggest change under the UEBMI is the requirement of being linked to one’s work unit, which makes it more difficult than it used to be for those out of work or engaged in
informal jobs (of which most are females) to be covered by medical insurance. Under the labor insurance system, a work unit’s medical insurance covered family members, although covering only half of their medical expenses. Meanwhile, under the new health insurance system, it is difficult for someone without a formal job to be covered by the UEBMI. Thus, compared with men, the situation has gotten tougher for women than ever before.

From the perspective of the UEBMI system reform in China, we investigate whether the basic health insurance coverage rate for women is lower than that for men and how this gender gap varies across the age groups. As for younger women and men, due to their higher employment rate, a higher proportion of them obtains the UEBMI. Meanwhile, for older women and men, health insurance is also available, provided they originally have a job. And it is mainly the group without a job that faces more difficulties in obtaining health insurance, within which women ought to account for the largest proportion. Women’s lower labor participation rate suggests that they have significantly lower access to health care than men do, especially the elderly. This is the gender difference in health insurance coverage that is examined in this study.

Based on the census data, this paper describes in detail the gap between women's and men's health insurance coverage. Our most important finding is that this gap manifests itself primarily in terms of age, where there is a large and persistent gender gap in the older age groups, and that the gender gap in health care coverage for younger people is not large due to the relatively high participation rate of Chinese women in the labor force. We describe the institutional context in which this disparity arises and analyze the potential impact of gender disparities in health insurance on health care utilization and health.

This study first confirms the existence of a gender gap in health insurance coverage based on a survey of a large population sample. Thereafter, we compare the changes in these gaps before and after the 1998 UEBMI reform using the China Health and Nutrition Survey (CHNS) data. Finally, we draw our conclusions and provide recommendations.

2. Methodology

2.1 Data sources

In this study, we used three datasets to validate gender differences in health insurance: one-fifth of the 2005 National Sample Survey of 1% of the population (randomly chosen; Sample A), the 2015 survey data of 1% of the population in Sichuan Province (Sample B), and the 1991–2011 survey data from the CHNS (Sample C).

We began by using Sample A. China conducts a population census every 10 years, and a large-scale population survey—the 1% of the population sample survey—is conducted between the two censuses. This survey covers 2,585,481 individuals in 31 provinces, autonomous regions, and municipalities in Chinese mainland. Populations in both agricultural and non-agricultural areas are included in the survey. The survey covers respondents’ personal characteristics, including gender, age, and educational level, as
well as other information such as the type of health insurance, health status, and so on. In the subsequent analysis, we further used Sample B. Samples B comprises 1% of the population of Sichuan Province only and comprises 1 million respondents.

To test our conjecture, we used Sample C, which covers eight waves of pre- and post-1998 reform data, enabling us to make a comparison of the changes in medical insurance between men and women. The corresponding survey for Sample C covered nine provinces, which vary considerably in terms of geography, economic development, public resources and health indicators. A stratified sampling scheme was used to stratify districts in the nine provinces by income, with four districts in each province randomly selected. The entire survey consists of about 4,400 households, covering about 19,000 people. The survey participants are also tracked in follow-up surveys and some of them who could no longer be tracked due to migration and other reasons are replenished by adding new samples.

2.2 Variables

The key dependent variable (Insurance) in our analysis relates to whether or not a person is covered by the UEBMI. Insurance is a binary dummy variable that is 1 if the individual is enrolled in UEBMI and 0 if they are enrolled in NCMS, URBMI, or do not have any insurance. It should be noted that this study focuses on whether or not they are covered by UEBMI and therefore classifies individuals who are NCMS, URBMI, or do not have any insurance as one category. In 2005, when NCMS was only two years old, the participation rate was low and there were more uninsured individuals; by 2015, the percentage of uninsured was very low, and most people have been covered by UEBMI, NCMS or URBMI.

Age is an important grouping variable; thus, we removed samples under 15 years of age and separated the sample into age groups with 10-year intervals. We also conducted a heterogeneity analysis of the sample according to education level and compared the variability in insurance coverage based on education levels. In the regression analysis, we controlled for the sample's personal characteristics such as gender, Hukou, marital status, and ethnicity. Hukou (a unique household registration system in China) is a dummy variable that refers to whether the survey respondent is registered in a rural or urban area. Classifications for marital status include married, unmarried, and widowed, and ethnicity is a dummy variable that denotes whether the sample is an ethnic minority or not.

2.3 Estimation models

We constructed a simple multiple regression model to investigate further the gender gap of health insurance coverage. The model is presented in Eq. (1) below:

\[
Insurance = \beta_1 \text{age} \times \text{female} + \beta_2 \text{age} + \beta_3 \text{female} + X \gamma + u
\]

where the subscripts \(i\) denotes individual; \(\beta\) and \(\gamma\) are the estimated parameters, in which \(\beta_1\) is our key parameter that captures the differences in insurance coverage across age groups. The dependent variable, \(Insurance\), denotes whether individual \(i\) is covered by UEBMI; \(age\) denotes the age group of
individual \( i \); \( female \) denotes the gender of individual \( i \); and \( X \) denotes the other control variables, including Hukou, educational level, marital status, and regional fixed effects. The error term \( u \) denotes the random variability not explained by the model. Due to the large size of the sample, the results of the OLS, probit, or logit analyses for this part were basically consistent. For the convenience of intuitively explaining the coefficients here, only the results of the OLS estimates were discussed.

3. Results

3.1 Gender Gap in Health Insurance Coverage: Based on Survey Data of 1% of the Population in 2005 (Sample A)

In the first stage of the analysis, we used Sample A. Figure 1 shows that for all age groups, the proportion of women covered by health insurance was lower than that of men. This was due to the higher labor participation rate of men. Meanwhile, by age group, the proportions of men and women with insurance coverage revealed different distribution trends. For men, the proportion of those covered by health insurance increased continually with age; while for women aged below 50 years, the proportion increased continually with age as well. However, this proportion kept declining continuously for the older women (aged above 50 years) and more obviously for those aged above 60 years. Considering the educational level (Fig. 3), the UEBMI coverage rates for men and women aged below 50 years were almost equivalent. However, for the groups aged over 50, for women, the proportion of those with insurance coverage was significantly lower than that for men only in the less educated group (primary school graduates and below), and this gap tended to widen with age. In general, this suggests that education level might have influenced the low rate of insurance coverage for the older people, while this effect of education did not exist for the younger people.

Next, in the regression estimation, we classified the population by age, with \([50, 55)\) being the control group. Table 1 reports the result of the ordinary least squares (OLS) regression, in which columns 1 and 2 correspond to regression models with and without control variables (such as education), respectively. As shown in Table 1, when variables such as the educational level were not controlled for, the proportion of women being covered by UEBMI in all age groups was always lower than that of men (the coefficients of both female and female*age are significantly positive). This is consistent with the previous results as shown in Fig. 2. Moreover, when controlling for variables such as the educational level, the coefficient of women became significantly positive, indicating a higher proportion of women being covered by health insurance in the age group of \([50, 55)\) as compared with men. However, since the other cross-term coefficients of gender and age are both significantly negative and the absolute values are greater than the coefficient of female, this indicates that generally, the women's health insurance coverage rate was still significantly lower than that of men. By further observing the coefficients of the interaction term, we can clearly find their obvious changes below and above the age bracket of \([50, 55)\). Below this age bracket, there is no clear trend in these cross-item coefficients, while above this age bracket they continue to increase in absolute value. This means that the health insurance coverage gap between women and men has been continuously widening for those above the age of 55.
Taking a step further, we examined the gap of health insurance coverage between men and women considering different education levels (see Table 2). The results of the regression show that it was only in the groups of less educated (primary school graduates and below) people that this phenomenon of continuous widening of the gap existed. In groups of senior middle school graduates and below, women's health insurance coverage rates were all lower than that of men's but did not show an expanding trend. Among higher educated people, women's health insurance coverage rates were not necessarily lower than that of men's, signifying that the gender gap in health insurance was not obvious among the old, higher educated people.
Table 1
Gender Gap in Health Insurance Coverage: Based on Survey Data of 1% of the Population in 2005

| Urban Employee Basic Medical Insurance (UEBMI) |  (Dependent Variable: Covered by UEBMI or Not) |
|-----------------------------------------------|-----------------------------------------------|
|                                               | (1)                                          |
| Female                                        | -0.0238***                                  |
|                                               | (0.00202)                                   |
| Female *age [15,25)                           | 0.0149***                                   |
|                                               | (0.00260)                                   |
| Female *age [25,35)                           | -0.00381                                    |
|                                               | (0.00245)                                   |
| Female *age [35,45)                           | -0.00803***                                 |
|                                               | (0.00238)                                   |
| Female *age [45,50)                           | -0.00190                                    |
|                                               | (0.00290)                                   |
| Female *age [55,60)                           | -0.0242***                                  |
|                                               | (0.00310)                                   |
| Female *age [60,65)                           | -0.0504***                                  |
|                                               | (0.00340)                                   |
| Female *age [65,70)                           | -0.0613***                                  |
|                                               | (0.00359)                                   |
| Female *age [70,75)                           | -0.0730***                                  |
|                                               | (0.00386)                                   |
| Female *age [75,80)                           | -0.0885***                                  |
|                                               | (0.00455)                                   |
| Female *age [80+,100)                         | -0.0963***                                  |
|                                               | (0.00499)                                   |
| X                                             | No                                           |
|                                               | YES                                          |
| City                                          | YES                                          |
|                                               | YES                                          |

Notes: 1) The control age group is [50, 55).
### Urban Employee Basic Medical Insurance (UEBMI)

| (Dependent Variable: Covered by UEBMI or Not) |
|-----------------------------------------------|
| Observations | 1,904,763 | 1,903,627 |
| $R^2$         | 0.197     | 0.273     |

2) The control variable $X$ includes registered permanent residence, marital status, educational level, nationality, and so on. City represents fixed effects after controlling for cities.

3) ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. The numbers in parentheses are standard errors of robust SE.

**Notes:**

1) The control age group is [50, 55).
Table 2
Gender Gap in Health Insurance Coverage: Considering Education Level

| Dependent Variable: Covered by the Urban Employee Basic Medical Insurance (UEBMI) or Not | (1) Primary School Graduates and below | (2) Junior Middle School Graduates | (3) Senior Middle School Graduates | (4) University Graduates and above |
|---|---|---|---|---|
| Female | -0.00277 | 0.0432*** | 0.0476*** | 0.0254*** |
|        | (0.00253) | (0.00374) | (0.00676) | (0.00813) |
| Female * age | -0.00513 | -0.0568*** | -0.0773*** | -0.0254** |
| [15,25] | (0.00425) | (0.00426) | (0.00832) | (0.0114) |
| Female * age | -0.00259 | -0.0667*** | -0.115*** | -0.0442*** |
| [25,35] | (0.00350) | (0.00414) | (0.00775) | (0.00898) |
| Female * age | 0.00799** | -0.0616*** | -0.0771*** | -0.0210** |
| [35,45] | (0.00323) | (0.00412) | (0.00759) | (0.00898) |
| Female * age | 0.0109*** | -0.0472*** | -0.0324*** | -0.0185* |
| [45,50] | (0.00395) | (0.00507) | (0.00825) | (0.0111) |
| Female * age | -0.0111*** | -0.0228*** | -0.00231 | -0.0169 |
| [55,60] | (0.00367) | (0.00640) | (0.0108) | (0.0129) |
| Female * age | -0.0237*** | -0.0795*** | -0.0496*** | -0.0212 |
| [60,65] | (0.00395) | (0.00778) | (0.0118) | (0.0141) |
| Female * age | -0.0288*** | -0.0540*** | -0.0402*** | -0.0235 |
| [65,70] | (0.00406) | (0.0103) | (0.0137) | (0.0157) |
| Female * age | -0.0318*** | -0.0493*** | -0.0559*** | -0.0329 |
| [70,75] | (0.00427) | (0.0134) | (0.0177) | (0.0202) |
| Female * age | -0.0492*** | -0.0367* | -0.108*** | 0.0309 |
| [75,80] | (0.00493) | (0.0194) | (0.0274) | (0.0253) |
| Female * age | -0.0646*** | -0.158*** | -0.130*** | -0.0368 |
| [80+,100] | (0.00534) | (0.0265) | (0.0357) | (0.0443) |
| Observations | 771,963 | 755,007 | 248,055 | 128,602 |
| R-squared | 0.278 | 0.215 | 0.187 | 0.129 |

Notes: 1) The control age group is [50, 55).
2) The control variable X and fixed effects of cities have been added to all analyses.

3) ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. The numbers in parentheses are standard errors of robust SE.

3.2 Gender Gap in Health Insurance Coverage: Based on Survey Data of 1% of the Population in 2015 (Sample B)

In the following analysis, we further used Sample B.

Figure 6 indicates that the results are similar to those generated from using Sample A, except that the turning point here has shifted to the age of 60. Below the age of 60, men and women's UEBMI coverage rates were almost equivalent, and the coverage rate for young women was even higher than that for men. Meanwhile, the proportion of women aged above 60 covered under UEBMI was much lower than that of men. Considering the educational level, the coverage rates for men and women below 60 were almost equivalent and not influenced by the educational level. Meanwhile, for those aged over 60, only for the less educated groups (primary school graduates and below) was there a significantly lower coverage rate for women than for men, and this gap continued to grow with age.

We applied model (1) on Sample B to perform the same regression and report the corresponding results in Tables 3 and 4. As seen from the tables, for those below the age bracket of [60, 65), there is no clear trend in these cross-item coefficients, but the coefficients continuously increase (with a negative sign) for those above this age bracket. This indicates that the gap in UEBMI coverage rates between women and men has been getting wider and wider for those above the age of 60. Moreover, considering the educational levels, the regression analysis shows that this phenomenon of continuous increase in insurance gap coverage for those above the age bracket of [60, 65) only existed among the less educated population (primary school graduates and below).

Combining the results above, compared with the analysis based on Sample A, the study using Sample B yielded almost the same results. The only difference is the age at which the change in the gender gap in health insurance coverage occurred, which increased from age 50 to age 60. This suggests that the situation (i.e., failing to get insurance coverage) did not change 10 years later for part of the women aged above 50.
| Gender Gap in Health Insurance Coverage: Based on Survey Data of 1% of the Population in 2015 |
|------------------------------------------------------------------------------------------------|
| Urban Employee Basic Medical Insurance (UEBMI) (Dependent Variable: Covered by UEBMI or Not) |
| (1) | (2) | (3) |
| Female | -0.0224*** | -0.0278*** | 0.0151*** |
|        | (0.0029)   | (0.0026)   | (0.0024)  |
| Female *age [15,25) | 0.0381*** | 0.0366*** | -0.0207*** |
|        | (0.0031)   | (0.0029)   | (0.0028)  |
| Female *age [25,35) | 0.0307*** | 0.0284*** | -0.0094*** |
|        | (0.0035)   | (0.0032)   | (0.0029)  |
| Female *age [35,45) | 0.00516  | 0.0076**  | -0.0129*** |
|        | (0.0034)   | (0.0031)   | (0.0028)  |
| Female *age [45,50) | -0.0020  | 0.0030    | -0.0109*** |
|        | (0.0036)   | (0.0033)   | (0.0030)  |
| Female *age [50,55) | 0.00734* | 0.0106*** | 0.00580*  |
|        | (0.0039)   | (0.0036)   | (0.0033)  |
| Female *age [55,60) | 0.0226*** | 0.0221*** | 0.0204*** |
|        | (0.0045)   | (0.0041)   | (0.0038)  |
| Female *age [65,70) | -0.0261*** | -0.0249*** | -0.0251*** |
|        | (0.0045)   | (0.0041)   | (0.0038)  |
| Female *age [70,75) | -0.0497*** | -0.0449*** | -0.0428*** |
|        | (0.0050)   | (0.0046)   | (0.0042)  |
| Female *age [75,80) | -0.0559*** | -0.0528*** | -0.0442*** |
|        | (0.006)    | (0.0055)   | (0.005)   |
| Female *age [80+,100) | -0.0932*** | -0.0796*** | -0.0707*** |
|        | (0.0060)   | (0.0055)   | (0.0051)  |
| X     | No   | YES     | YES     |
| County | No   | No     | YES     |

Notes: 1) The control age group is [60, 65).
**Urban Employee Basic Medical Insurance (UEBMI)**

*(Dependent Variable: Covered by UEBMI or Not)*

| Observations | 838,544 | 838,544 | 838,544 |
|--------------|---------|---------|---------|
| R-squared    | 0.016   | 0.144   | 0.284   |

**Notes:**
1) The control age group is [60, 65).
2) The control variable X includes registered permanent residence, marital status, educational level, nationality, and so on. County represents fixed effects after controlling for counties.
3) ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. The numbers in parentheses are standard errors of robust SE.
Table 4
Gender Gap in Health Insurance Coverage: Different Educational Levels

| Dependent Variable: Covered by Urban Employee Basic Medical Insurance (UEBMI) or Not | (1) Primary School Graduates and below | (2) Junior Middle School Graduates | (3) Senior Middle School and Technical Secondary School Graduates | (4) University Graduates and above |
|---|---|---|---|---|
| Female | 0.00946*** | 0.103*** | 0.0455** | -0.0199 |
| | (0.00213) | (0.00811) | (0.0177) | (0.0274) |
| Female age[15,25] | -0.00516* | -0.102*** | -0.0471*** | 0.0552** |
| | (0.00270) | (0.00821) | (0.0178) | (0.0277) |
| Female age[25,35] | -0.00835*** | -0.108*** | -0.0547*** | 0.0487* |
| | (0.00293) | (0.00824) | (0.0181) | (0.0281) |
| Female age[35,45] | -0.0126*** | -0.106*** | -0.0216 | 0.0330 |
| | (0.00265) | (0.00829) | (0.0187) | (0.0284) |
| Female age[45,50] | -0.0136*** | -0.102*** | 0.0198 | 0.0186 |
| | (0.00272) | (0.00848) | (0.0205) | (0.0297) |
| Female age[50,55] | -0.0102*** | -0.0752*** | 0.0637*** | 0.0330 |
| | (0.00293) | (0.00886) | (0.0207) | (0.0306) |
| Female age[55,60] | 0.00491 | -0.00148 | 0.0454** | 0.00977 |
| | (0.00325) | (0.0109) | (0.0227) | (0.0351) |
| Female age[65,70] | -0.0167*** | -0.0177 | -0.0201 | 0.00665 |
| | (0.00344) | (0.0150) | (0.0278) | (0.0446) |
| Female age[70,75] | -0.0329*** | -0.0590*** | -0.0130 | 0.0176 |
| | (0.00386) | (0.0188) | (0.0310) | (0.0457) |
| Female age[75,80] | -0.0301*** | -0.0763*** | -0.00922 | 0.0143 |
| | (0.00469) | (0.0258) | (0.0335) | (0.0440) |
| Female age[80+,100] | -0.0485*** | -0.0806** | -0.106** | -0.0681 |
| | (0.00484) | (0.0336) | (0.0419) | (0.0572) |
| Observations | 306,558 | 324,610 | 126,747 | 80,629 |

Notes: 1) The control age group is [60, 65).
Dependent Variable: Covered by Urban Employee Basic Medical Insurance (UEBMI) or Not

| R²      | 0.109 | 0.188 | 0.307 | 0.360 |

Notes: 1) The control age group is [60, 65).
2) The control variable X and fixed effects of counties have been added to all analyses.
3) ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. The numbers in parentheses are standard errors of robust SE.

3.3 Gender insurance gap before and after the implementation of the Urban Employee Basic Medical Insurance (UEBMI) reform

Before the UEBMI reform in 1998, labor insurance, in effect, had covered family dependents. Thus, women, even though without a job, were able to obtain medical insurance benefits through the coverage of their working spouse. However, after the reform, the UEBMI's feature of being tied to work and not including other family members, made it harder than before for these unemployed women to obtain health insurance, which might have led to a widening of the gender gap in health insurance coverage. To verify this conjecture, we used Sample C, covering data before and after the 1998 reform to enable us to make a comparison of changes in medical insurance between men and women.

First, the changes in the UEBMI coverage rate from 1991 to 2011 reappear in Fig. 5 (what should be noted here is that we combined labor insurance and various forms of employee medical insurance modes before 1998 into employee medical insurance for a comparison before and after that year). Figure 5 shows that there was a significant decline in the medical insurance coverage rates for all age groups before 2000 but these began to increase rapidly starting from the implementation of the UEBMI. In 2011, the UEBMI had already covered 25% of the population.

Meanwhile, Fig. 6 shows no obvious difference in health insurance coverage rates between men and women among the investigated population in 1991 and 1993. However, the increasingly apparent gender gap was observed in the survey samples of 1997 and later, in 2000, 2004, 2006 and 2009, and this gap mainly existed among the older population.

4. Discussion

4.1 Gender difference in health insurance coverage

The analysis shows that there are significant gender differences in health insurance, especially among the elderly, because of the unique health insurance system in China. The health insurance reform in 1998, which tied health insurance to work, led to a greater number of jobless women not obtaining health insurance. According to a study based on the 1998 and 2003 National Health Service Survey data by Xu et.al [23], the inequality in getting health insurance has intensified among different populations since
1997 because of the UEBMI reform. Moreover, the possibility for women and the low-income and middle-aged groups of being insured has significantly declined compared with that in the period before the reform. Theoretically, the unemployed or flexibly employed can also be enrolled in the UEBMI, except that they must bear a higher contribution. According to the regulation, “for individual businesses and freelance personnel, the basic health insurance premium, consisting of the work unit's contribution and that of the individual, should all be paid by the individual.” Although it is theoretically possible for a person to be insured, that is, to make a one-off social insurance contribution individually, a considerable amount of health insurance premium must be paid, which might be unaffordable for many families. Moreover, the requirement to pay premiums for at least 15 years reduced the probability of coverage for those over 35 years of age, when the retirement age in China was 50. Enrolment for those aged above 35 meant that premiums would continue to be paid even after retirement, with the costs borne entirely by the individual. This explains why the gender gap in health insurance coverage increased with age and why gender differences were concentrated in the over-50 years old sample in 2005. Why do elderly women face more difficulties in obtaining medical insurance? This is mainly a result of differences in labor participation. It is more likely for elderly women to be laid off or lose their jobs and more difficult for them to be reemployed. For instance, with the reform of the SOEs in the late 1990s, a large number of workers were laid off or lost their jobs when enterprises were facing increasingly competition [24–27].

4.2 Gender differences among different educational groups

Regarding subgroups by education, gender differences in health insurance are mainly concentrated in the low-education group. The empirical study of Appleton et.al [28] indicated that women and people who are less educated, less skilled, and middle-aged are more likely to be laid off. During the critical period of the reform of China's SOEs, less educated women were not competitive in the labor market, which made them vulnerable to changes in the labor market. During this period, a large number of SOEs were restructured or went bankrupt, which caused a significant number of workers to lose their jobs. The group of women with low education was the most affected. On the one hand, there was greater demand for male labor, as China was primarily developing industries at that time. On the other hand, low-educated women were mainly employed in jobs that were highly substitutable with and highly vulnerable to technological advances [29]. The loss of a job meant the loss of health insurance, which increased the medical burden on women and reduced accessibility of health resources. Furthermore, inequitable access to medical resources might have directly affected the health of the population.

4.3 Gender differences in health insurance and health status

In the literature, major disputes have always existed with regard to the relationship between health insurance and the status of health. In a few studies, significant effects of the expenditure on health insurance are found on people's health status and death rates [30–31]. However, most empirical studies have indicated a lower impact [32–34]. Under the background of the generally realized universal health insurance in China, numerous recent empirical studies have shown that during the gradual process of implementing the basic health insurance, it had significantly enhanced the availability of medical
services, and improved the insured’s situation of “diseases not being diagnosed” and their health condition [35–37].

However, with the low proportion of older women being covered under the UEBMI, it was difficult for most of them to receive the necessary medical services. Specifically, a comparatively lower effect was on hospitalization rates and a higher effect was on average hospitalization expenditure per incidence of hospitalization. This suggests that the gender gap in health insurance exerted influence on people’s health status mainly through its effects on the quality of medical services, including patients’ ability to select better hospitals, medicine, and treatments. The high hospitalization rate of women was just a reflection of their worse health status, and women’s higher incidence of nonfatal chronic diseases was probably a result of their not having access to medical services that have the same quality as those enjoyed by men.

Although women tend to live longer compared with men, a large number of studies have shown that their health condition is worse [38–40]. According to the findings of existing literature, the poorer health status of women in developed countries is a result of their higher possibility of suffering from nonfatal chronic diseases such as arthritis, most respiratory illnesses, hypertension, eyesight problems and depression [39]. A new study by Zhang et al. [40] indicated that about 30% of the gender health gap among Chinese residents could be explained by the difference in the social and economic status between men and women, of which the role of education is most important. The remaining 70% could be attributed to women’s higher morbidity rate for chronic diseases, wherein arthritis, angina pectoris, and eye diseases have the highest contribution rate to the gender health gap. However, in our study, what is different from the findings in developed countries is as follows. While in the western developed countries, citizens’ gender health gap generally tends to disappear gradually, that of the Chinese citizens’ do not shrink with age (Fig. 7). As indicated in Fig. 7, women of all ages reported worse health than men, but this gap was especially significant among older people (above 60).

This study explains gender health disparities from the perspective of health insurance. We find that women are less healthy compared with men, and this health gender gap is more pronounced among older adults, which is associated with gender differences in obtaining health insurance. We argue that since the UEBMI in China mainly covers people with formal jobs, the lower labor participation rate (even much lower in formal jobs) of women leads to their greater difficulty in obtaining health insurance, which results in women’s lower rate of insurance coverage as compared with men. However, during the period of the UEBMI’s implementation, because it was more difficult for older women to obtain jobs or easier for them to be laid off, the ratio of those obtaining insurance was even much lower. In fact, the effects of education and chronic diseases on the gender health gap are mostly exerted through health insurance channels [40]. A lower level of education leads to women’s higher likelihood of being unemployed and thus, not being able to obtain the basic health insurance. Due to the lack of medical insurance, women are inevitably at a disadvantage when acquiring necessary medical services, which explains their higher probability of suffering from chronic diseases.
Notes: (1) The vertical axis is the ratio of female and male in good health in all age groups.
(2) The data are from the sample survey of 1% of the population in 2005.

5. Conclusion

From the perspective of health insurance reform, this paper explains the gender gap of health insurance and the reason for the wider gap among older people. Our study indicates that since the UEBMI in China mainly covers people with formal jobs, the lower labor participation rate (even much lower in formal jobs) of women leads to their greater difficulty in obtaining health insurance. However, due to older women's greater difficulty in obtaining jobs or being susceptible to lay-offs during the period of the UEBMI's implementation, the ratio of those obtaining insurance was even much lower at that time. In fact, it was because of the combined effects of the UEBMI system and the labor market condition at that time that older women had a lower proportion of obtaining the UEBMI.

We used a large volume of data from a demographic survey to verify our conjecture. First, based on the data from the survey of 1% of the population in 2005 and in 2015, it is found that relatively smaller health insurance disparity between men and women existed in the group aged below 50 or 60 years, while a larger disparity existed for those aged above 50 or 60. At the same time, we also find that the proportion of women aged over 50 (2005) or 60 (2015) covered under the UEBMI was much lower than that of men, while the gap between young women and men was comparatively narrower. Furthermore, using the 1991–2011 data of CHNS, we find that the disadvantages of women in medical insurance coverage only emerged after the implementation of the urban employee medical insurance reform in 1998. This further verifies our previous conjecture.

Abbreviations

SHI
social health insurance
OLS
Ordinary least squares
UEBMI
Urban Employee Basic Medical Insurance
URBMI
Urban Resident Basic Medical Insurance
NRCMS
New Rural Cooperative Medical Scheme
CHNS
China Health and Nutrition Survey
SOEs
State-owned Enterprises
Declarations

Ethics approval and consent to participate

Not applicable

Consent for publication

Not applicable

Availability of data and materials

The datasets generated and/or analyzed during the current study are not publicly available due to the data confidentiality agreement, but are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests

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Authors' contributions

SZ led the study. He designed the study, led the data collection, analysis, and interpretation. MZ contributed to the study design, provided input into the data analysis, and wrote the first draft of the manuscript. ZZ contributed to the study design, reviewed the manuscript and helped the writing of the final draft manuscript. All authors read and approved the final manuscript.

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**Figures**

**Figure 1**

The Urban Employee Basic Medical Insurance (UEBMI) Coverage Rate: Based on Survey Data of 1% of the Population in 2005
Figure 2

The Urban Employee Basic Medical Insurance (UEBMI) Coverage Rate in 2005 by Educational Levels

Figure 3
The Urban Employee Basic Medical Insurance (UEBMI) Coverage Rate: Based on Survey Data of 1% of the Population in 2015

Figure 4

Gender Gap in the Urban Employee Basic Medical Insurance (UEBMI) Coverage in 2015 by Educational Levels
Figure 5

Coverage Rate of Employee Medical Insurance: 1991–2011
Figure 6

Gender Gap of Employee Medical Insurance Coverage: 1991-2009
Figure 7

Gender Health Gap

Notes: (1) The vertical axis is the percentage of individuals in good health.

(2) The data are from the sample survey of 1% of the population in 2005.