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Shuangge Ma, *Yale University*



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# Health insurance coverage, medical expenditure and coping strategy: Evidence from Taiwan

Kuangnan Fang, PhD<sup>1,4</sup>, Ying Dai, PhD<sup>2</sup>, Ben-Chang Shia, PhD<sup>3,4</sup> and Shuangge Ma, PhD<sup>2,4\*</sup>

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<sup>1</sup> *School of Economics, Xiamen University, Xiamen, China*

<sup>2</sup> *School of Public Health, Yale University, CT, USA*

<sup>3</sup> *Department of Statistics and Information Science, FuJen Catholic University, Taiwan*

<sup>4</sup> *Data Mining Research Center, Xiamen University, Xiamen, China*

**\* Corresponding author:**

Shuangge Ma, School of Public Health, Yale University, 60 College ST, New Haven CT, 06520 ,USA.

Email: [Shuangge.ma@yale.edu](mailto:Shuangge.ma@yale.edu)

Tel: 203-785-3119; Fax: 203-785-6912

## **Abstract**

This study provided a comprehensive and updated description of health insurance in Taiwan. Of special interest were insurance coverage, medical expenditure and coping strategy. Data was collected via a phone call survey conducted in August and September, 2011. Household was the unit for survey. A total of 2,424 households covering all major counties and cities in Taiwan were surveyed. The results revealed that households with smaller sizes and higher incomes were more likely to have public and private health insurance. Insurance couldn't fully remove the financial burden caused by illness. Presence of chronicle disease and presence of inpatient treatment were significantly associated with medical expenditure. Regional difference was observed, with households in Northern, Central and Southern regions paying less gross medical expenditure than those on offshore islands. Households with presence of inpatient treatment were more likely to cope with medical expenditure using means other than salary.

## **Key words**

Taiwan, health insurance coverage, medical expenditure, coping strategy

## **Introduction**

The health insurance system in Taiwan is composed of public and private health insurance. The public insurance system, called universal national health insurance (NHI), was inaugurated in 1995 and administrated by the Department of Health. NHI aimed to ensure that all Taiwanese had access to health care regardless of their financial status. However, in order to avoid moral hazard, patients were required to make copayments when they received outpatient or inpatient care, dental care, emergency care or Chinese medicine services. The copayments incented patients to limit their medical visits and thus reduce medical costs. Occasionally, they could be considerably high. Copayments varied according to the type of provider. For example, medical centers charged more than clinics for outpatient care<sup>1</sup>. To further reduce the potential financial loss caused by illness, people also purchased private health insurance. By 2010, Taiwan's private health insurance market was composed of twenty-three domestic and seven foreign companies<sup>2</sup>. Interestingly, there was no significant conflict between the public and private insurance systems. Taiwan experienced growth in the demand for private health insurance with NHI. Possible explanations were offered by Liu and Chen.<sup>3</sup>

There has been extensive research on Taiwan's health care and health insurance system. Cheng provided description of major achievements of NHI, including government administration, access, freedom in choice, utilization of services and benefits offered.<sup>4</sup> Some studies discussed financial burden for both the government and insured.<sup>5</sup> There were also studies focusing on women, children and elderly, who were not covered by public insurance before the implementation of NHI.<sup>6-7</sup> Wen et al. analyzed the role of NHI in improving life expectancy and reducing health disparities.<sup>8-9</sup> The differences between different economic groups and between rural and urban areas were also of interest.<sup>10-11</sup> Most published studies

including those mentioned above focused on NHI, which was only one side of the health insurance system with the other side being private insurance. Studies on NHI had investigated its multiple aspects, including access, expenditure and copayment, and demonstrated that NHI had significant effects on the insured.

In this study, we focused on the coverage, expenditure and coping aspects of health insurance in Taiwan, targeting at providing a comprehensive description of the health insurance system. Regarding coverage and access, Lu and Hsiao showed that by the end of 2001, 97% of the total eligible population had enrolled in NHI.<sup>5</sup> Lee et al. reported a coverage rate over 98%. *Error! Bookmark not defined.* It is worth noting that these data had been generated by the Bureau of National Health Insurance, as opposed to independent sampling. Regarding cost, Cheng and Chiang concluded that the coping expenditure designed in the insurance scheme seemed to have an insignificant effect on curbing medical care utilization.<sup>12</sup> Lu and Hsiao illustrated that the population covered by NHI was well protected against large medical expense and the gross medical cost was under control.<sup>5</sup> Despite the significant implications of NHI, it was only a part of the health insurance system. *For the insured, it is insensible to separate public insurance from private insurance.* To provide a more comprehensive description, both types of insurance need to be considered. In addition, both the private and public health insurance are still undergoing fast evolvement. Thus, there is a need to a timely update. The objective of this study was to provide a comprehensive and updated description of several important aspects of both public and private health insurance in Taiwan.

## Methods

Taiwan is an island of 36,000 square kilometers and has a population of 23 million. The per capita GDP was predicted to be \$35,604 in 2011. In Taiwan, there are 18 major counties and cities and Taipei, Kaohsiung, Xinbei, Taichung and Tainan, which are under the direct administration of the central government. Based on the geographic location, they have been separated into the northern, central, southern, eastern and offshore regions.

Data was collected in a cross-sectional survey conducted in August and September, 2011. The unit of sample was household. The phone call survey was conducted by staff at the Department of Statistics and Information Science, FuJen Catholic University and approved by a university research ethics review committee. Survey staff used a RDD (random digit dialing) method to select the samples. Mitofsky-Waksberg<sup>13</sup> type samples of active blocks of 100 consecutive telephone numbers from all possible such blocks within each counties and cities were drawn. The probability of a block's initial selection was a positive linear function of the proportion of the block's 100 numbers that served residences. In sample selection, we focused on landline only, as it was difficult to associate a cell phone number with a physical location for a household.

At the beginning of each interview, the survey staff would introduce the purpose of this survey. The survey staff would not ask the follow-up questions if the self-reported age of interviewee was under 18 or could not provide reliable information on the household based

on self-evaluation. Information was gathered using a structured questionnaire including questions on demographics, health condition, insurance coverage, medical expenditure and coping strategy. For each question, the survey staff would offer a set of predefined options. Some questions, including household size and insurance coverage, were “snapshots” at the time of survey. Other questions, including household income, consumption of health care, health condition and coping strategy, were designed to reflect the accumulation over a period of twelve months. The answers were then input by the interviewer into a database.

S-Plus version 8.2 (TIBCO Software Inc.) was used for analysis. In order to determine whether to combine the data collected in different counties and cities, we used ANOVA and Chi-square tests to examine the differences between these data. We found that although there were some differences, it was sensible to combine and analyze. We computed summary statistics for the whole cohort and subgroups and conducted between-group comparisons using t-test, Chi-square test or Fisher’s exact test. As the dependent variables of main interest were categorical due to the nature of survey, we used logistic regression for analysis. For coverage, we computed each household’s coverage rate as the number of people covered divided by the household size. Because of the significant differences between NHI and private insurance, these two were also analyzed separately. For each set of analysis, we dichotomized coverage rates at 50% and created dummy variables. For medical expenditure, we analyzed two different aspects. One was gross medical expenditure, and the other was net out-of-pocket medical expenditure. For coping, we analyzed strategy for dealing with high and extremely high cost separately.

## **Results**

### *Descriptive statistics*

Descriptive statistics of the 2,424 households with 9,593 members were shown in Table 1. 91.63% of the members were insured by public health insurance, which was lower than that reported in Lu and Hsiao<sup>5</sup>. We split the samples into two groups based on whether insurance coverage was greater 50%. Out of the 2,424 households, 96.9% (2349) had more than half of the household members covered. 96.5% (2347) and 10.6% (257) households had more than half of the members covered by public and private health insurance, respectively. 1001 households were from the northern area, 702 were from the central area, 444 were from the southern area, 103 were from the eastern area, and 174 were from the offshore islands. The average household size of the whole cohort was 3.957. The averages of household size were 4.014 and 2.173 for the high and low overall insurance coverage groups, respectively (p-value <0.001). Similarly, households with higher public insurance coverage and private insurance coverage had smaller sizes (both p-values<0.001). There was a significant difference of income between high and low private insurance coverage groups (p-value <0.001). Particularly, households with higher income tended to have more private insurance coverage. Since household expense was tightly connected to income, we observed a similar association between coverage rate and expense. In this study, health condition was measured by the number of hospitalized inpatient treatment and the presence of diagnosed chronic

disease. About 30% of the households with family member(s) had at least one inpatient treatments. Households with higher coverage rates were more likely to have five or more inpatient treatments. For example, 14.67% households in the high overall insurance coverage group had five or more inpatient treatments, compared with only 0.81% households in the low overall insurance coverage group ( $p\text{-value}<0.001$ ). There was no significant association between the presence of chronic disease and coverage rate.

### *Insurance coverage*

The results of coverage regression were shown in Table 2. Household size had a significant effect on both public and private insurance coverage with odds ratios 0.84 and 0.26, respectively, indicating that bigger households were more likely to have lower insurance coverage. This result differed from that of an early study<sup>3</sup>. High income levels (between NT\$450K and NT\$675K, and over NT\$675K) had a positive effect on public and private insurance coverage (odds ratios 2.921 and 2.542, 1.234 and 1.131 respectively), suggesting that households with higher income were more likely to buy private and public insurance. Such a finding was consistent with Liu and Chen.<sup>3</sup> Studies on health insurance in western countries also suggested an association between health insurance coverage and income status.<sup>14-15</sup> There was a significant association between expense and insurance coverage, with high expense ( $>\text{NT\$}450\text{K}$ ) having a significantly negative effect on public insurance coverage (odds ratio 0.182); High expense levels had a positive effect on private insurance coverage (odds ratios 4.158 and 7.099). Households with high expense had high income and were more likely to be able to afford private insurance. Presence of chronic disease was associated with higher coverage rate. Chronic diseases are long-lasting which allows households with presence of chronic disease to get public insurance to cope with future medical expense. Presence of inpatient treatment had negative effect on both public and private insurance coverage (odds ratios 0.499, 0.529 and 0.596 respectively). For both public and private insurance coverage, there was no significant difference among regions. The finding differed from that in Liu and Chen<sup>3</sup>, which showed the dependence of coverage on residential location.

For both public and private insurance, increase of coverage is an important goal. Particularly for public insurance, the ultimate goal of NHI is to cover all of Taiwan's population. Our analysis provides suggestions for future target to increase coverage.

### *Gross and net medical expenditure*

We considered both gross and net (out-of-pocket) medical expenditure. Gross medical expenditure could be of significant interest to the government and insurance companies, while net medical expenditure, medical expenditure after insurance reimbursement, was more important to measure real household expenditure. Published studies have shown that out-of-pocket medical expenditure was an important factor for poverty in many Asian countries.<sup>16</sup> The insured poor faced financial barriers to health care services, and their illness condition had a negative effect on their financial situation.<sup>2</sup> For each kind of medical

expenditure, we created a categorical response variable, which could be easier to manage in survey and less likely to be subject to recall error than a continuous variable. Households were split in two groups, medical expenditures >NT\$45K versus ≤ NT\$45K. As the response variables were binary, logistic models were used. Analysis results were shown in Table 3.

We compared the low and moderate cost group (≤NT\$45K) against extremely high cost group (>NT\$45K). Household size had a significant positive effect on out-of-pocket expenditure with odds ratio 1.190. All income levels had significant associations with out-of-pocket medical expenditure. The low and medium income levels had negative effects, whereas the high income level group (>NT\$675K) was more likely to have higher out-of-pocket medical expenditure, which was consistent with published studies. For example, Chu et al.<sup>2</sup> found that average out-of-pocket expenditure increased in conjunction with increased income. Inpatient treatment had a significant effect on high out-of-pocket medical expenditure with odds ratio 3.651 (p-value<0.001). However, the association between the presence of chronic disease and out-of-pocket medical expenditure was not significant. Private insurance coverage had a strong effect (odds ratio 7.381), while the effect of public insurance coverage was not significant. Liu and Chen<sup>3</sup> suggested that the higher the copayment, the more likely households were to buy private health insurance to protect themselves against potential catastrophic financial burdens. There was not significant difference among regions.

### *Coping strategies*

Our analysis suggested a considerable amount of out-of-pocket medical expenditure. It was thus of interest to investigate coping strategies – ways that households paid for medical expenditure. In the survey, there were five options for coping strategies, including (A) salary from last month, (B) saving, (C) help from family and friends, (D) loan, and (E) reduction in daily living cost. The distribution of coping strategies (A)-(E) was 64.65% (1567), 28.84% (699), 0.7% (17), 1.03% (25) and 4.78% (116), respectively. The majority of the households were able to self-finance out-of-pocket cost (answers A and B). We considered two sets of analysis. In the first set, we compared strategies (A) versus (B)-(E). Covering medical cost using last month's salary was the “best” coping strategy, imposing the least long term impact. In the second set of analysis, we compared strategies (A)-(B) versus (C)-(E), as options (A) and (B) corresponded to self-finance. As the coping strategy outcomes were binary, logistic regressions were conducted. The analysis results were shown in Table 4.

In the first set of analysis, we found that household size had a significant effect on coping strategy (odds ratio 1.091). Income levels, except for the level between NT\$450K and NT\$675K, had significant effects, with higher income levels less likely to use means other than salary (odds ratios 0.569, 0.602, and 0.619, respectively). Inpatient treatment had a significant effect on coping strategy (odds ratio 1.317), which implied that households with family members having inpatient treatment in the past twelve months were more likely to use savings, loan and other means. However, the association between presence of chronic disease and coping strategies was not significant. Inpatient treatments happened with low

frequencies and hit households without warning. As it was difficult to plan for such incidents ahead, households were more likely to pursue coping strategies other than salary. Chronicle diseases were recurrent, with low to moderate cost for each episode. Well-planned households usually had well-adjusted coping plans that could cover cost using monthly income without having to resort to outside financial sources. The effect of public and private insurance coverage was not significant. There was no significant difference among regions.

In the second set of analysis, household size had a significant effect on coping strategy. All income levels had significant associations with coping strategy, and the odds ratios were smaller than one (0.49, 0.197, 0.518 and 0.127 respectively), suggesting that the higher the income, the less likely were households to pay using means other than salary and saving. The effects of presence of chronicle disease and inpatient treatment were significant (odds ratios 1.622 and 1.866, respectively). Unlike in the first set of analysis, public and private insurance coverage had significant associations with coping strategies (odds ratios 0.066 and 0.025, respectively), suggesting that the higher the public and private insurance coverage, the less likely were households to pursue coping strategies other than salary and saving.

Most of the households surveyed in this study were able to self-finance out-of-pocket medical expenditure using salary and saving, without having to rely on outside financial sources or reduce daily living cost. However, there were still 6% of the households that warranted further attention. Future policy development may focus on this subcohort that suffers a long financial impact caused by illness and out-of-pocket expenditure.

## **Discussion and Conclusion**

In this article, we reported a survey recently conducted on health insurance in Taiwan. This study complements published studies by providing comprehensive, updated descriptions of several important aspects of Taiwan's health insurance. The health insurance system in Taiwan has been appraised as one of the successful models. Understanding its achievements as well as problems can provide valuable information to various Taiwan insurance agencies and, more importantly, to countries that are or will be pursuing a similar system.

For both public and private insurance, increase of coverage is an important goal. Particularly for public insurance, the ultimate goal is to cover all of its population. Households with smaller sizes and higher income levels (annual income greater than NT\$450K) were more likely to buy private insurance and public insurance. Households with presence of chronicle disease were more likely to have public and private health insurance. It is of interest to note the negative association between coverage rate and inpatient treatment. Cost associated with inpatient treatment is an important component of catastrophic health expenditure,<sup>17-18</sup> which may directly lead to poverty. From a policy point of view, it is of significant interest to design the insurance system in a way that can protect such households. Two kinds of medical expenditure, gross and out-of-pocket, were investigated in this study. Gross medical expenditure can be of significant interest to government, while out-of-pocket medical expenditure can measure the real expenditure of a household for health care because



of the copayment and other relevant cost. Our study found that health insurance could not totally remove the financial burden caused by illness. This study also investigated the coping strategies. Households with family members having inpatient treatments in the past twelve months were more likely to use savings, loan and other means different from salary. However, the association between presence of chronicle disease and coping strategies was not statistically significant.

Investigating both public and private insurance provides a more comprehensive description of households' insurance status. However, a tradeoff is that the policy implications of the study results may be ambiguous as the *net* effect of public insurance could not be investigated – it is thus not clear how the government should tune the public insurance policy. Because of the phone call survey nature of this study, the collected information might not be detailed enough. Particularly, the data were either snapshot at the time of survey or aggregated data over twelve months. Such data had limitations. For example, the insurance status and household size might change over time. The aggregated data could not describe the variations across different illness episodes and their differences in financial consequences. In addition, it had been suggested that measuring out-of-pocket cost as a single item might result in a slightly biased estimation (usually under-estimation). On the other hand, the present design also has advantages. Particularly, households often had multiple illness episodes, and they tended to remember the total cost and how they paid for all of them in general, rather than for a single episode. It was possible or even likely that multiple coping strategies were taken, while in the survey we focused on the single *most important* coping strategy. The aforementioned limitations are also shared by studies of a similar nature.

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The authors declared no potential conflicts of interests with respect to the research, authorship and publication of this article.

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**Table 1** Summary statistics of samples and stratified by insurance status.

| Variables                                      | Total   | Combined insurance |         | Public insurance |         | Private insurance |         |
|------------------------------------------------|---------|--------------------|---------|------------------|---------|-------------------|---------|
|                                                |         | coverage           |         | coverage         |         | coverage          |         |
|                                                |         | >50%               | =<50%   | >50%             | =<50%   | >50%              | =<50%   |
| Area                                           |         |                    |         |                  |         |                   |         |
| Whole cohort                                   | 2424    | 2349               | 75      | 2347             | 77      | 257               | 2167    |
| Northern area                                  | 1001    | 969                | 32      | 968              | 33      | 101               | 900     |
| Central area                                   | 702     | 678                | 24      | 677              | 25      | 74                | 628     |
| Southern area                                  | 444     | 428                | 16      | 428              | 16      | 48                | 396     |
| Eastern area                                   | 103     | 101                | 2       | 101              | 2       | 10                | 93      |
| Offshore islands                               | 174     | 173                | 1       | 173              | 1       | 24                | 150     |
| p-value                                        |         | (<0.001)           |         | (<0.001)         |         | (0.688)           |         |
| Household size                                 | 3.957   | 4.014              | 2.173   | 4.140            | 2.220   | 4.595             | 3.882   |
| Mean (sd)                                      | (1.711) | (1.706)            | (0.381) | (1.769)          | (0.476) | (2.042)           | (1.651) |
| P- value                                       |         | (<0.001)           |         | (<0.001)         |         | (<0.001)          |         |
| Household income (Percentage)                  |         |                    |         |                  |         |                   |         |
| Less than 135,000                              | 23.47   | 23.41              | 25.33   | 23.43            | 24.68   | 18.68             | 24.04   |
| 135,000-225,000                                | 18.44   | 18.18              | 26.67   | 18.19            | 25.97   | 6.61              | 19.84   |
| 225,000-450,000                                | 25.04   | 25.03              | 25.33   | 25.05            | 24.68   | 22.18             | 25.38   |
| 450,000-675,000                                | 18.56   | 18.82              | 10.67   | 18.75            | 12.99   | 25.68             | 17.72   |
| More than 6750,000                             | 14.48   | 14.56              | 12.00   | 14.57            | 11.69   | 26.85             | 13.01   |
| P- value                                       |         | ( 0.207)           |         | ( 0.372)         |         | (<0.001)          |         |
| Household expense (Percentage)                 |         |                    |         |                  |         |                   |         |
| Less than 45,000                               | 11.06   | 11.15              | 8.00    | 11.16            | 7.79    | 5.45              | 11.72   |
| 45,000-135,000                                 | 25.41   | 25.37              | 26.67   | 25.39            | 25.97   | 15.18             | 26.63   |
| 135,000-225,000                                | 36.63   | 36.82              | 30.67   | 36.77            | 32.47   | 22.18             | 38.35   |
| 225,000-450,000                                | 18.56   | 18.48              | 21.33   | 18.49            | 20.78   | 33.46             | 16.80   |
| More than 450,000                              | 8.33    | 8.17               | 13.33   | 8.18             | 12.99   | 23.74             | 6.51    |
| P- value                                       |         | ( 0.393)           |         | ( 0.488)         |         | (<0.001)          |         |
| The number of inpatient treatment (Percentage) |         |                    |         |                  |         |                   |         |
| None                                           | 69.22   | 69.60              | 57.33   | 69.58            | 58.44   | 78.21             | 68.16   |
| One                                            | 20.50   | 20.43              | 22.67   | 20.45            | 22.08   | 21.79             | 20.35   |
| Two                                            | 7.47    | 7.54               | 5.33    | 7.54             | 5.19    | 0                 | 8.35    |
| Three                                          | 1.49    | 1.53               | 0       | 1.53             | 0       | 0                 | 1.66    |
| Four                                           | 0.08    | 0.09               | 0       | 0.09             | 0       | 0                 | 0.09    |
| Five or more                                   | 1.24    | 0.81               | 14.67   | 0.81             | 14.29   | 0                 | 1.38    |
| P value                                        |         | (<0.001)           |         | (<0.001)         |         | (<0.001)          |         |
| Presence of chronic disease (Percentage)       |         |                    |         |                  |         |                   |         |
| Yes                                            | 36.63   | 36.61              | 37.33   | 36.64            | 36.36   | 33.07             | 37.06   |
| No                                             | 63.37   | 63.39              | 62.67   | 63.36            | 63.64   | 66.93             | 62.94   |
| P value                                        |         | ( 0.995)           |         | (0.944)          |         | (0.236)           |         |

**Table 2**

Logistic regression results of insurance coverage

| Independent variables                         | Public insurance | Private insurance |
|-----------------------------------------------|------------------|-------------------|
| <b>Household size</b>                         | 0.84***          | 0.26***           |
| <b>Household income (baseline: &lt;135K)</b>  |                  |                   |
| B: between 135K and 225K                      | 0.825            | 0.424***          |
| C: between 225K and 450K                      | 1.493            | 0.940             |
| D: between 450K and 675K                      | 2.542**          | 1.234**           |
| E: over 675K                                  | 2.906**          | 1.131**           |
| <b>Household expense (baseline: &lt;45K)</b>  |                  |                   |
| B: between 45K and 135K                       | 0.722            | 1.647             |
| C: between 135K and 225K                      | 0.562            | 1.351             |
| D: between 225K and 450K                      | 0.366            | 4.158***          |
| E: over 450K                                  | 0.182***         | 7.099***          |
| <b>Presence of chronicle disease</b>          | 1.169**          | 1.150 ***         |
| <b>Inpatient treatment (&gt;0)</b>            | 0.529**          | 0.596***          |
| <b>Regions (Offshore islands as baseline)</b> |                  |                   |
| Northern area                                 | 0.144            | 0.959             |
| Central area                                  | 0.144            | 0.894             |
| Southern area                                 | 0.155            | 0.873             |
| Eastern area                                  | 0.259            | 0.943             |

*Note:* Numbers presented are odds ratios. \*\*\* statistically significance at 1%; \*\*statistically significance at 5%. \*statistically significance at 10%.

**Table 3**

Logistic regression results of gross and net medical expenditures

| Independent variables                        | Gross Medical expenditure | Net Medical expenditure |
|----------------------------------------------|---------------------------|-------------------------|
|                                              | >45K                      | >45k                    |
| <b>Household size</b>                        | 1.258 ***                 | 1.190***                |
| <b>Household income (baseline: &lt;135K)</b> |                           |                         |
| B: between 135K and 225K                     | 0.649                     | 0.617*                  |
| C: between 225K and 450K                     | 0.354                     | 0.317***                |
| D: between 450K and 675K                     | 0.406**                   | 0.403 ***               |
| E: over 675K                                 | 1.501 ***                 | 1.249 ***               |
| <b>Presence of chronicle disease</b>         | 1.253                     | 1.296                   |
| <b>Inpatient treatment (&gt;0)</b>           | 3.611***                  | 3.651***                |
| <b>Public insurance coverage</b>             | 0.760                     | 2.170                   |
| <b>Private insurance coverage</b>            | 1.602                     | 7.381 **                |
| <b>Regions(Offshore islands as baseline)</b> |                           |                         |
| Northern area                                | 0.665                     | 0.706                   |
| Central area                                 | 0.511 *                   | 0.551                   |
| Southern area                                | 0.751                     | 0.806                   |
| Eastern area                                 | 0.997                     | 1.069                   |

*Note:* Numbers presented are odds ratios. \*\*\*statistically significance at 1%; \*\*statistically significance at 5%; \*statistically significance at 10%.

**Table 4**

Logistic regression results of coping strategies.

| Independent variables                         | Salary    | Salary + Saving |
|-----------------------------------------------|-----------|-----------------|
| <b>Household size</b>                         | 1.091 *** | 0.255***        |
| <b>House income (baseline: &lt;135K)</b>      |           |                 |
| B: between 135K and 225K                      | 0.569 *** | 0.490***        |
| C: between 225K and 450K                      | 0.602 *** | 0.197***        |
| D: between 450K and 675K                      | 1.033     | 0.518***        |
| E: over 675K                                  | 0.619 *** | 0.127***        |
| <b>Presence of chronicle disease</b>          | 0.882     | 1.622 ***       |
| <b>Inpatient treatment (&gt;0)</b>            | 1.317***  | 1.866 ***       |
| <b>Public insurance coverage</b>              | 0.655     | 0.066 ***       |
| <b>Private insurance coverage</b>             | 0.861     | 0.025 ***       |
| <b>Regions (Offshore islands as baseline)</b> |           |                 |
| Northern area                                 | 0.983     | 0.985           |
| Central area                                  | 1.017     | 1.176           |
| Southern area                                 | 1.034     | 1.144           |
| Eastern area                                  | 0.928     | 0.769           |

*Note:* Numbers presented are “odds ratio”. \*\*\*statistically significance at 1%, \*\*statistically significance at 5%. \*statistically significance at 10%. In the first regression, we coded the outcome variable “using salary (A)” as 0 and “using other means (B-E)” as 1. In the second regression, we coded the outcome variable “salary or saving (A-B)” as 0 and “other means (C-E)” as 1.

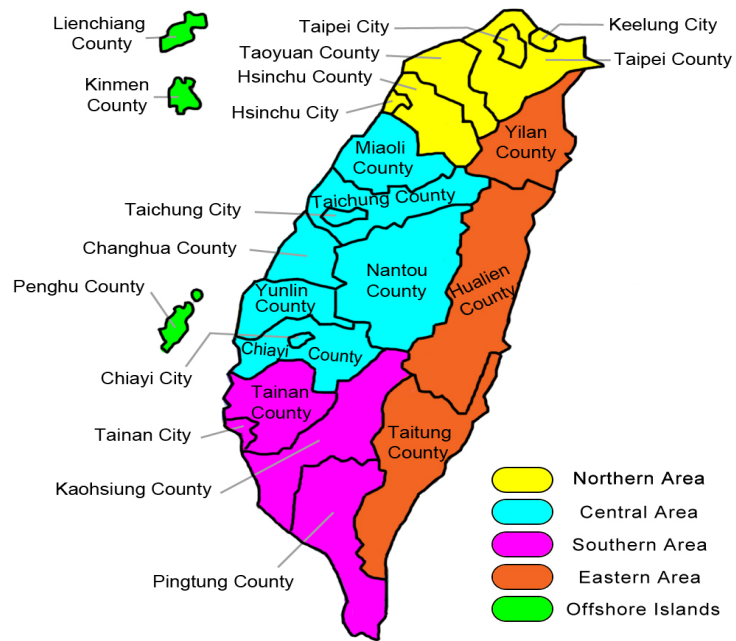


Figure 1. Map of Taiwan