The Potential of Private Health Insurance Ownership Based on the 2018-2020 National Socioeconomic Survey Data

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Abstract
In 2014, the Indonesian Government introduced a social security program in the health sector. However, Indonesia’s out-of-pocket expenses remain high due to a lack of public interest in National Health Insurance services. Financing expensive health services with high out-of-pocket expenses has the potential to cause poverty. Private health insurance is considered a solution to this problem. This study aimed to determine the socioeconomic factors of private health insurance ownership and its potential in Indonesia. This study used secondary data from the 2018, 2019, and 2020 National Socioeconomic Surveys. Logistic regression analysis showed that the variables related to private health insurance ownership were age, sex, education, economic status, employment status, marital status, household status, and location of residence. The most dominant variable in 2018 was per capita expenditure (economic status), while education was the most dominant variable in 2019 and 2020. The result of this study can be used to formulate a strategy for increasing participation in private health insurance. The socioeconomic health sector should use this information to target specific markets for private health insurance.

Keywords: National Health Insurance, private health insurance, socioeconomic determinant

Introduction
The out-of-pocket (OOP) expenses for health insurance in Indonesia were more than 30% of total health expenditures in 2021.1 High OOP in health financing can exacerbate the disease burden on individuals due to delayed or missing care, strained personal finances, and an increased likelihood of financial disaster, impoverishment, or deteriorating social determinants of health.2 Private health insurance is important in reducing OOP in health financing.2 Several studies have found that private health insurance as additional insurance has a significant effect on reducing the burden of OOP payments.4-8

Although the National Health Insurance (NHI) program was introduced in 2014, public interest in NHI services tends to be low because the system is still considered unsatisfactory.9 People from middle to upper economic statuses prefer OOP rather than using NHI. The small number of private health insurance providers in Indonesia is one of the reasons why private health insurance progress has been extremely slow in Indonesia.10 Private health insurance companies must develop products that people need and know which potential customers to target.

This study aimed to provide a foundation for strengthening private health insurance in Indonesia by examining the characteristics of its users and analyzing its determinants so that private companies can know their marketing target. It is hoped that private health insurance companies will be interested in making health insurance services that strengthen private health insurance ownership in Indonesia. In addition, it is expected that the government will consider the results of this study when developing additional health insurance programs for NHI participants.

Method
This study used secondary data from the 2018, 2019, and 2020 National Socioeconomic Surveys (NSS)/Survei Sosial Ekonomi Nasional (SUSENAS). These data used the head-of-household level as the unit of research analysis. Univariate analysis was conducted to determine the characteristics of the head of household, and multivariate analysis was used to determine these characteristics’ relationships to private health insurance ownership.
The univariate analysis in this study consisted of descriptive responses to the variables and examined the characteristics of 70,102,253 heads of households. The variables studied consisted of age (in years); sex, divided into two categories (male and female); educational background, divided into five categories (uneducated, elementary school/equivalent, junior high school/equivalent, senior high schools/equivalent, and higher education); and economic status or per capita expenditure (expenses per household per month) in Indonesian Rupiah (IDR). Employment status was divided into occupations (unemployed, informal, and formal) and types of occupations (extractives, manufacturing, and services).

Marital status was divided into single and married. Household status was divided into the number of household members, the number of household children under five were considered, the NHI ownership, private health insurance ownership, and insurance ownership (without

Table 1a. Variables and Operational Definitions

| Variable          | Category     | Operational Definition                        | Unit/Scale | Value Range                  |
|-------------------|--------------|----------------------------------------------|------------|------------------------------|
| Age               |              | Head of household age                        | Years      | Numeric (15–97 years old)    |
| Sex               | Male         | Head of household sex is male                | Nominal    | 1 if the head of the household is male
|                   | Female       | Head of household sex is female              | Nominal    | 0 if the head of the household is female
| Education         | Uneducated   | The head of household never received a formal education or graduated from school | Ordinal    | 1 if the head of household never received an education or graduated from school
|                   |             | Uneducated is the base variable              |            | 0 if other conditions (graduating elementary school, graduating from junior high school, graduating from high school, graduating from college) |
|                   | Elementary   | The highest education of household head is an elementary school graduate | Ordinal    | 1 if the household head graduated only from elementary school
|                   |             |                                              |            | 0 if other conditions (not going to school, graduating from junior high school, graduating from high school, graduating from college) |
|                   | Junior high school | The highest education of household head is a junior high school graduate | Ordinal    | 1 if the household head graduated only from junior high school
|                   |             |                                              |            | 0 if other conditions (not going to school, graduating from elementary school, graduating from high school, graduating from college) |
|                   | Senior high school | The highest education of household head is a senior high school graduate | Ordinal    | 1 if the household head graduated only from senior high school
|                   |             |                                              |            | 0 if other conditions (not going to school, graduating from elementary school, graduating from high school, graduating from college) |
|                   | Higher education | The highest education of household head is a college graduate | Ordinal    | 1 if the head of the household graduate from college
|                   |             |                                              |            | 0 if other conditions (not going to school, graduating from elementary school, graduating from junior high school, graduating from college) |
| Occupation        | Unemployed   | The household head has no job               | Ordinal    | 1 if the head of household has no job
|                   |             | Unemployed as the base variable             |            | 0 if other conditions (informal worker or formal worker) |
|                   | Informal     | The household head is a blue-collar worker   | Ordinal    | 1 if the head of household is an informal worker
|                   |             |                                              |            | 0 if other conditions (has no job or a formal worker) |
|                   | Formal       | The household head is a white-collar worker  | Ordinal    | 1 if the head of household is a formal worker
|                   |             |                                              |            | 0 if other conditions (has no job or an informal worker) |
| Types of occupation | Extractive | Head of household works in the extractive sector | Nominal   | 1 if the head of household works in the extractive sector (agriculture, plantation, fishery, forestry, mining)
|                   | Manufacture  | Head of household works in the manufacturing sector | Nominal   | 0 if other conditions (not working, working in the manufacturing sector) |
|                   | Service      | Head of household works in the service sector | Nominal   | 1 if the head of household works in the service sector (trade, services, communications, finance)
|                   | Marital status | The head of household has never been married or is divorced | Nominal   | 1 if the head of household is single
|                   | Single       | Single is the base variable                 |            | 0 if head of household is married
|                   | Married      | The head of household is married            | Nominal   | 1 if the head of household is married
|                   |             |                                              |            | 0 if head of household is single |
health insurance, NHI only, only private health insurance, and ownership of both NHI and private health insurance). Area of Residence was classified as urban or rural (Table 1).

Multivariate analysis was performed after the logistic regression analysis to determine which variables significantly influenced the variable of private health insurance ownership. The logistic regression equation was used to estimate the probability of private health insurance ownership. Variables were selected by binary logistic analysis in advance of the logistic regression analysis, and it was used to select the correlated variable to the dependent variable (private health insurance ownership) with a significance level of 5%. The selected variables were then analyzed using logistic regression analysis. The coefficient in this analysis indicates the magnitude of the probability of a category, and a positive value indicates that the probability of a category is greater than that of the comparison category (the variable defined as a base). However, a negative coefficient means that the probability of the category is smaller than that of the comparison category. The results of the exponential estimated value of the regression coefficient (β) obtained the value of the odds ratio, with a significance level of 5%.

### Results

The univariate analysis in this study consisted of descriptive responses to the variables. Household characteristics are shown in Table 2. Based on sex, the 2018-2020 NSS was dominated by males. Based on the head of the household’s type of work was dominated by work in the informal sector. The head of the household’s occupation category was dominated by the service sector. The marital status of the head of the household was dominated by married status. Urban areas dominated the location of the household residences.

An average of four members dominated the number of household members. The distribution of the ownership of the NHI was dominated by members of the NHI. Private health insurance ownership distribution was dominated by households without it. The status of insurance ownership distribution was dominated by only NHI ownership.

The logistic regression equation estimated the opportunity for private health insurance ownership for NHI members with specific characteristics according to the abovementioned variables. The coefficient sign indicates the magnitude of the probability of a category; a positive sign indicates that the probability of a category is greater than the comparison category, while a negative coefficient sign means that the probability of the category is smaller than the comparison category. The base variable was used as the comparison variable.

The equation in Table 3 showed that the intercept value = -25.4885 when all independent variables are 0, including the ownership of additional private health insurance for NHI members, women living in a village, were uneducated, did not work, had never been married, family members less than four, and no children under five. The accuracy of the logistic regression model in predicting empirical data was seen in the classification table output, which was shown in the overall percentage value of 18%, meaning that the variation in the rate of additional private health insurance ownership among NHI members was only 18%, as determined by the overall predictor. It means that 82% of the additional private health
insurance ownership rate in NHI member households was determined by factors other than the analyzed predictors. From Table 3, the odds ratio value was indicated by the magnitude of the Exp(B) named coefficient value, which can be explained as follows:

**Age**

Older heads of households tended to have private health insurance coverage 0.145 times less. Health quality declines with age.

**Sex**

The male head of household participants tended to have private health insurance coverage 2.3 times greater than female participants in 2018, 1.1 times greater than females in 2019, and 2.6 times greater than females in 2020. Therefore, male heads of households tended to have insurance coverage. Overall, male private health insurance ownership was 2.03 times greater than that of females.

**Education**

In 2018, compared to uneducated heads of households, the participating heads of households with an elementary school education tended to have private health insurance coverage 4.2 times greater, and heads of households with a junior high school education tended to have private health insurance coverage 3.8 times greater. Heads of households with a senior high school education tended to have private health insurance coverage 9.5 ti-

### Table 2. Characteristics Based on Number of the Household Heads and Members in 2018, 2019, and 2020

| Variable | Category | 2018 | 2019 | 2020 |
|----------|----------|------|------|------|
|          | n        | Mean/Median | %    | n     | Mean/Median | %    | n     | Mean/Median | %    |
| Age (years) | 70,101,253 | 48.09/47 | 71,437,667 | 48.38/48 | 72,791,519 | 48.72/48 |
| Sex of household's head | Male | 59,466,985 | 84.85 | 60,394,034 | 84.54 | 61,278,854 | 84.18 |
| Education | Female | 10,634,270 | 15.17 | 11,043,633 | 15.46 | 11,512,685 | 15.82 |
|           | Uneducated | 3,396,168 | 5.13 | 3,322,611 | 4.63 | 3,108,850 | 4.27 |
|           | Elementary school | 31,047,973 | 44.29 | 31,135,056 | 43.58 | 30,679,215 | 42.15 |
|           | Junior high school | 11,388,111 | 16.25 | 11,915,752 | 16.68 | 11,643,284 | 16.00 |
|           | Senior high school | 17,480,847 | 24.94 | 17,831,343 | 24.96 | 19,833,711 | 27.25 |
|            | Higher education | 6,388,134 | 9.40 | 7,234,903 | 10.13 | 7,326,459 | 10.34 |
| Occupation | Male | 21,216,811 | 13.15 | 9,235,641 | 12.95 | 15,992,886 | 21.37 |
|           | Female | 34,651,721 | 49.43 | 34,900,111 | 48.85 | 28,536,169 | 38.93 |
|           | Formal | 26,252,721 | 37.42 | 27,301,915 | 38.22 | 28,462,464 | 39.10 |
| Type of occupation | Extractive | 21,983,372 | 36.11 | 21,653,901 | 34.81 | 21,869,141 | 34.67 |
|           | Manufacturing | 7,121,559 | 11.70 | 7,357,645 | 11.83 | 7,482,068 | 11.86 |
|           | Service | 31,779,511 | 52.20 | 22,190,480 | 53.36 | 33,729,040 | 53.47 |
| Marital status of household's head | Single | 13,667,696 | 19.50 | 14,655,780 | 20.52 | 15,352,309 | 21.06 |
|           | Married | 56,453,557 | 80.50 | 56,781,887 | 79.48 | 57,459,010 | 78.94 |
| Number of family members | 70,101,253 | 3.77 of 4 | 71,437,667 | 3.74/4 | 72,791,519 | 3.71 | 4 |
| Number of children under five in the household | 70,101,253 | 0.34 | 71,437,667 | 0.33 | 72,791,519 | 0.31 | 0 |
| NHI ownership | Head of household is not a member of NHI | 25,114,341 | 35.83 | 26,856,398 | 37.59 | 22,032,519 | 30.27 |
|            | Head of household is a member of NHI | 44,986,912 | 64.17 | 44,581,269 | 62.41 | 30,759,000 | 69.73 |
|            | Household does not have private health insurance | 66,837,063 | 95.34 | 68,381,939 | 95.72 | 69,908,963 | 96.04 |
| Private health insurance ownership | Household has private health insurance | 3,264,190 | 4.66 | 3,055,728 | 4.28 | 2,882,556 | 3.96 |
|            | No health insurance | 22,716,338 | 32.41 | 24,690,896 | 34.56 | 19,984,421 | 27.45 |
|            | Private health insurance | 44,120,723 | 62.94 | 43,691,043 | 61.16 | 49,924,542 | 68.59 |
|            | NHI and private health insurance | 2,398,003 | 3.42 | 2,165,502 | 3.03 | 2,048,098 | 2.81 |
| Insurance ownership | 866,187 | 1.24 | 890,226 | 1.25 | 834,458 | 1.15 |
| Area of household residence | Rural | 31,747,219 | 45.29 | 31,414,503 | 43.97 | 32,019,313 | 43.99 |
|            | Urban | 38,334,034 | 54.71 | 40,023,162 | 56.03 | 40,772,206 | 56.01 |

Note: NHI = National Health Insurance
mes greater. Overall, heads of households with higher education tended to have private health insurance coverage 1.5 times greater than uneducated heads of households.

In 2019, compared to uneducated heads of households, participating heads of households with an elementary school education tended to have private health insurance coverage 6.9 times greater, and heads of households with a junior high school education tended to have private health insurance coverage 7.9 times greater. Heads of households with a senior high school education tended to have private health insurance coverage 1.3 times greater. Overall, participating heads of households with higher education tended to have private health insurance coverage 1.6 times greater than the uneducated heads of households.

In 2020, compared to uneducated heads of households, participating heads of households with an elementary school education tended to have private health insurance coverage 1.5 times greater, and heads of households with a junior high school education tended to have private health insurance coverage 4.4 times greater. Heads of households with a senior high school education tended to have private health insurance coverage 0.8647 times greater. Overall, heads of households with higher education tended to have private health insurance coverage 1.4 times greater than uneducated heads of households.

Over all three years, in comparison to uneducated heads of households, participating heads of households with an elementary school education tended to have private health insurance coverage 1.3 times greater, heads of households with a junior high school education tended to have private health insurance coverage 4.4 times greater, and heads of households with a senior high school education tended to have private health insurance coverage 8.6 times greater. Overall, heads of households with higher education tended to have private health insurance coverage 1.4 times greater than uneducated heads of households.

**Economic Status**

In 2018, concerning per capita expenditure, participating heads of households tended to have private health insurance coverage 1.3 times greater than uneducated heads of households.

| Table 3. Logistics Regression Analysis Results |
|-----------------------------------------------|
| Logistic regression of private health insurance ownership | 2018 | 2019 | 2020 | all |
| Age (years) | 0.0338 | 0.0305 | 0.0145 | 0.0205 |
| Age_sq (years^2) | -0.00058 | -0.00049 | 0.00045 | 0.00045 |
| Sex Base: Female | 0.2350 | 0.1114 | 0.2589 | 0.2037 |
| Education Base: Uneducated | 0.4248 | 0.6899 | 0.1327 | 0.4468 |
| Graduated from elementary school or equivalent | 0.0058 | 0.0130 | 0.4374 | 0.5540 |
| Graduated from junior high school/equivalent | 0.3848 | 0.7977 | 0.0157 | 0.1985 |
| Graduated from senior high school/equivalent | 0.9508 | 1.2873 | 0.8647 | 1.0497 |
| Economic status Base: Rural area (village) | 0.1275 | 1.5881 | 1.4064 | 1.4437 |
| Employment status Base: Unemployed | 1.3292 | 1.3400 | 1.3950 | 1.3458 |
| Extractive sector | 0.4759 | 0.4531 | 0.8249 | 0.5691 |
| Manufacturing sector | 1.0486 | 0.9925 | 1.2925 | 1.0997 |
| Service sector | -0.0040 | 0.0739 | 0.2780 | 0.1051 |
| Marital status Base: Single | 0.8430 | 0.4608 | 0.7653 | 0.6771 |
| Number of family members Base: Household members ≤4 | 0.6430 | 0.4608 | 0.7653 | 0.6771 |
| Household members > 4 | 0.2644 | 0.1985 | 0.3084 | 0.2839 |
| Number of children under five years old Base: No children under five in the household | 0.2620 | 0.2637 | 0.0620 | 0.1192 |
| At least 1 child under five in the household | 0.5448 | 0.6835 | 0.4499 | 0.5636 |
| Area of residence Base: Rural area (village) | 0.5448 | 0.6835 | 0.4499 | 0.5636 |

Note: All variables are significant with a p-value<0.001
insurance coverage 1.3 times greater; in 2019, heads of households tended to have private health insurance coverage 1.340 times greater; and in 2020, heads of households tended to have private health insurance coverage 1.345 times greater. Overall, from 2018–2020, heads of households tended to have private health insurance coverage 1.3 times greater concerning per capita expenditure.

Employment Status
In 2018, in comparison to unemployed heads of households, participating heads of households in the agriculture/mining sector tended to have private health insurance coverage 4.8 times greater, heads of households in the manufacturing sector tended to have private health insurance coverage 1.05 times greater, and heads of households in the service sector tended to have private health insurance coverage 0.0040 times less. In 2019, heads of households in the agriculture/mining sector tended to have private health insurance coverage 4.5 times greater than those who were unemployed, while heads of households in the manufacturing sector tended to have private health insurance coverage 9.9 times greater, and heads of households in the service sector tended to have private health insurance coverage 0.7 times less.

In 2020, heads of households in the agriculture/mining sector tended to have private health insurance coverage 8.2 times greater than those who were unemployed, while heads of households in the manufacturing sector tended to have private health insurance coverage 1.3 times greater, and heads of households in the service sector tended to have private health insurance coverage 2.8 times greater. Overall, from 2018–2020, household heads in the agriculture/mining sector tended to have private health insurance coverage 5.7 times greater than those who were unemployed, while heads of households in the manufacturing sector tended to have private health insurance coverage 1.1 times greater, and heads of households in the service sector tended to have private health insurance coverage 1.05 times greater. Hence, the results of this study indicated that working status greatly affected private health insurance coverage compared to unemployed people.

Marital Status
In 2018, heads of households who were single tended to have private health insurance coverage 6.4 times greater than their married counterparts. In 2019, heads of households tended to have private health insurance coverage 4.6 times greater than those who were single. In 2020, heads of households who were married tended to have private health insurance coverage 7.6 times greater than those who were single. Overall, from 2018–2020, heads of households who were married tended to have private health insurance coverage 6.7 times greater than those who had never been married.

Household Status
In 2018, households with more than four family members tended to have private health insurance coverage 2.6 times greater than households with fewer than four family members. In 2019, households with more than four family members tended to have private health insurance coverage 1.9 times greater than households with fewer than four family members. In 2020, households with more than four family members tended to have private health insurance coverage 2.8 times greater than households with fewer than four. Hence, the results of this study indicated that households with fewer than four family members were less likely to have private health insurance.

In 2018, households with one child under five tended to have private health insurance coverage 2.6 times greater than households without children under five. In 2019, households with one child under five tended to have private health insurance coverage 2.6 times greater than households without a child under five. In 2020, households with one child under five tended to have private health insurance coverage 0.6 times less than households without children under five. Overall, from 2018–2020, households with one child under five tended to have private health insurance coverage 1.2 times greater than those households without children under five.

Area of Residence
In 2018, households in urban area tended to have private health insurance coverage 5.4 times greater than households in rural area. In 2019, households in urban area tended to have private health insurance coverage 6.8 times greater than those in rural area. In 2020, households in urban area tended to have private health insurance coverage 4.5 times greater than those in rural area. Overall, from 2018–2020, households in urban area tended to have private health insurance coverage 5.6 times greater than households in rural area.

Discussion
This study implied that older individuals tended to have health insurance more than younger ones. This result was in line with a study by Shao, et al., stated that the older someone is, the more they will be aware of health insurance. People in the 40-44 and 45-49 age groups had an 11% and 8% higher likelihood of health insurance, respectively.

Heads of households with higher education tended to
have private health insurance coverage 1.4 times greater than uneducated heads of households. This finding showed that education plays an important role, as it could enlighten individuals about the importance of health insurance coverage. Education also helped individuals make informed choices about health issues, including purchasing health insurance to avoid huge health expenses when they were ill. People with higher education had a higher view of the need for health insurance to deal with unexpected health problems. In contrast, people with low education were unaware of the threat caused by unforeseen health problems.\textsuperscript{11,14}

The higher economic status (seen from the level of expenditure) of the household’s head in this study tended to have private health insurance coverage 1.5 times greater. Accordingly, the results of this study indicated that the tendency of per capita spending was highly influential in having private health insurance guarantees. Income is an important determinant of both the demand for health services and the decision to have health insurance.\textsuperscript{8} Some studies have stated that the most critical factor affecting general insurance was income.\textsuperscript{11,14,15} Regarding occupation, the employed status significantly affected private health insurance guarantees compared to those unemployed. Participation in the formal sector’s health insurance was dominated by workers in the public sector (civil servants and armed forces), while health insurance participation in the informal sector was dominated by farmers, fishermen, and the like.\textsuperscript{16,17} In terms of marital status, people who were single were less likely to have private health insurance ownership. The status of living together is likely to be greater than that of those who are divorced/dead.\textsuperscript{16} Married women were more likely to have private coverage than the singles in almost all income groups.\textsuperscript{11,12}

Households with one child under five tended to have private health insurance coverage 1.2 times greater than households without one. Thus, the results of this study indicated that households without a child under five were less likely to have private health insurance. A study in Bangladesh found that parents might have less capacity to pay premium health insurance than other family members.\textsuperscript{16} Health insurance schemes sometimes view women as wives or mothers, rather than as individuals or workers, even though each individual’s right to social insurance is fundamental. If women’s access to social or health insurance comes through their husbands, this can protect the family, not women’s autonomy.\textsuperscript{8}

In this study, households in urban area were likelier to have private health insurance coverage than those in rural ones. Hence, an individual residing in a village was less likely to have private health insurance. The reason of that informal sector workers in rural areas had a lower chance of having health insurance compared to those living in urban areas was that public health insurance companies were mostly found in urban areas, and these companies adjusted their health insurance products to meet the needs of urban people.\textsuperscript{17} The difficulty of access and the high cost of transportation also made health insurance less valuable because it was difficult to use; thus, informal sector workers in villages did not feel the need to have health insurance.\textsuperscript{18} In brief, rural people did not consider health insurance a need because the product design did not match them.

**Conclusion**

The results of this study show a relationship between age, sex, education, economic status, employment status, marital status, household status, and location of residence with private health insurance ownership. Particularly, most households in this study do not enroll in private health insurance. The government should understand this situation and find the best solution to strengthen the health insurance ecosystem in Indonesia. These results can be used to formulate a strategy for strengthening private health insurance ownership. The health economic sector should use this information to expand the target market for private health insurance.

**Abbreviations**

OOP: Out-of-Pocket; NHI: National Health Insurance; NSS: National Socioeconomic Surveys; SUSENAS: Survei Sosial Ekonomi Nasional; IDR: Indonesian Rupiah.

**Ethics Approval and Consent to Participate**

The Research and Community Engagement Ethical Committee, Faculty of Public Health, Universitas Indonesia, granted ethical approval, No. Ket-558/UN2.F10.D11/PPM.00.02/2022.

**Competing Interest**

The authors declare that there are no significant competing financial, professional, or personal interests that might have affected the performance.

**Availability of Data and Materials**

Since this study used secondary data, it can be accessed through Statistics Indonesia.

**Authors’ Contribution**

ARH conceptualized and designed the study, collected data, and analyzed and interpreted the results. AB guided data analysis, review, and manuscript approval. CC provided the latest research literature, prepared draft manuscripts, and served as the corresponding author.

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