Private Health Insurance in Malaysia: Who Is Left Behind?

Nur Zahirah Balqis-Ali, BMEd[1] [iD]**, Jailani Anis-Syakira, MSc[1],
Weng Hong Fun, PhD[1], and Sondi Sararaks, MCommHealth[1]**

Abstract

Despite various efforts introduced, private health insurance coverage is still low in Malaysia. The objective of this article is to find the factors associated with not having a private health insurance in Malaysia. We analyze data involving 19 959 respondents from the 2015 National Health Morbidity Survey. In this article, we describe the prevalence of not having health insurance and conducted binary logistic regression to identify determinants of uninsured status. A total of 56.6% of the study population was uninsured. After adjusting for other variables, the likelihood of being uninsured was higher among those aged 50 years and above, females, Malay/other Bumiputra ethnicities, rural, government/semigovernment, self-employed, unpaid workers and retirees, unemployed, lower education level, without home ownership and single/widowed/divorced, daily smoker, underweight body mass index, and current drinker. The likelihood of being uninsured also increased with increasing household size while the inversed trend was seen for household income. A substantial proportion of population in Malaysia did not have private health insurance, and these subgroups have limited preferential choices for provider, facility, and care.

Keywords

Malaysia, National Health and Morbidity Survey, private health insurance, uninsured, vulnerable group

What We Already Know

- Malaysia health system is dichotomous, with almost free of charge public health care and fee for service private health care.
- Private health insurance in Malaysia serves as a secondary role of duplicating the public health services.
- Private health insurance allows population greater access to private health care that offers preferential access to timely care, choice of provider and care options, as well as reduced waiting time.

What This Article Adds

- The population more likely to be uninsured and had limited preferential access to health care were vulnerable groups including those aged 50 years and above, females, Malay/other Bumiputra ethnicity, rural, government/semigovernment, self-employed, unpaid workers and retirees, unemployed, lower education level, without home ownership and single/widowed/divorced, daily smoker, underweight body mass index, and current drinker. The likelihood of being uninsured increased with increasing household size while the inversed trend was seen for household income.

- These vulnerable groups need to tap into financial resources such as savings to enable private inpatient care or continue accessing the public health care, which is under pressure from congestion and concern of the sustainability from current financing method.
- Despite various initiatives introduced to reduce the burden of these vulnerable groups in getting adequate health services, more effort needs to be in place by the government to increase their preferential access to health care.

Introduction

In countries with large publicly funded health systems, private health insurance (PHI) fortifies the system by increasing access to both public and private health sectors.[1,2] In these settings, PHI serves a secondary role of either supplementing,

[1]Institute for Health Systems Research, National Institutes of Health, Ministry of Health, Shah Alam, Selangor, Malaysia

Corresponding Author:
Nur Zahirah Balqis-Ali, Centre for Health Outcomes Research, Institute for Health Systems Research, National Institutes of Health, Block B2, No. 1, Jalan Setia Murni U13/52, Seksyen U13 Bandar Setia Alam, Shah Alam, Selangor 40170, Malaysia.
Email: dr.nurbalqis@moh.gov.my

complementing, or duplicating public health services, which may come at the expense of access for public patients.[3] Through these roles, PHI allows greater access to private health care that offers preferential choice for timely care, provider, care options, and waiting time, which may contribute toward health and wellbeing.[3]

In Malaysia, private hospitals establishment began in 1950s and progressively increased to 210 hospitals in 2019.[4,5] Corporatization of certain public health care facilities, like the National Heart Institute and the availability of preferential services, provided more options for treatment with varying charges.[4,6] There were obvious disparities between the services offered by the public and private sectors, with shorter waiting times and the ability to choose your own doctor deemed better served in the private health sector.[7] Twenty-one percent of the population reported waiting times to see doctor in public hospitals as inadequate, compared with 3.2% for private hospitals.[7] Similarly, choice of health care provider was rated inadequate (14.9%) by respondents who received public inpatient care, compared with 3.0% for private hospitals.[4,7] However, for the population without PHI coverage, payment option includes paying out-of-pocket (OOP). This results from a dichotomous health care system of heavily tax-financed public health care accessible almost free of charge (a maximum of Malaysian Ringgit [MYR] 500/US$127.98 is incurred per hospitalization for third-class public-sector ward charges),[8] and a private sector that relies mostly on OOP financing, allowing the more affluent better access to private sector health care.[4]

Although Malaysia has a pro-poor public and a pro-rich private sector with a government spending of slightly more than half of the 4.3% of GDP on total health expenditure (THE), equality of access and financial risk protection is good.[9] Despite recognized achievements in universal health coverage, sustainability remains a challenge.[6] The country's percentage for OOP per THE showed an increasing trend, from 29.6% in 2000 to 34.2% in 2010 and 38% in 2017,[4] reflecting the demand for private health care. In 2017, private sector sources of financing, amounting to 48.9% of THE, were mainly from private household OOP (77%), while private insurance, corporations, and other private sector agencies contributed 15%, 5% and 3%, respectively.[10] The use of private sector reduces congestion and cost pressure through voluntary opt-out from public services. However, the population could return to public health care at any time, which typically occurs due to cost or the need for prolonged care.[11] The PHI in Malaysia is sold under Medical and Health Insurance (MHI) policy and has been in the Malaysian market since 1970s. These policies can be attained on voluntary basis either by individual purchase or through employer-sponsored health insurance (ESHI) scheme.[12] The PHI mostly covers private hospital inpatient treatments, with the consumer usually paying the bill upfront prior to being reimbursed by the insurance company,[13] and can be used in public facilities.[14] As of 2018, there were 210 private hospitals accommodating 15 957 beds (27.3%), mostly in urban areas, as opposed to 144 public hospitals with 42 424 beds nationwide.[5] PHI serves duplicative or additional option for purchasers since utilization of public facilities are not affected. It is risk-rated, whereby increasing age or individuals with preexisting conditions may either be charged higher premiums or precluded from purchase.[13] Additionally, premiums vary greatly depending on extent and duration of coverage.[15]

Despite long-standing establishment, the MHI sales in Malaysia only surged in the 1990s after the introduction of personal income tax relief in 1996. The government's decision to allow stand-alone MHI policies in 1997 also helped catalyze the market's growth. Most insurers use the service of managed care organizations for more efficient administrative processes as well as curbing the total administrative cost.[12] The MHI market was regulated by the government through the Central Bank of Malaysia, mainly through the guidelines and regulations provided under the Private Health Care Facilities and Services 1998. Efforts were made to encourage the uptake of PHI in Malaysia, including addressing the needs of certain target groups, such as the elderly.[12]

In Malaysia, 15% of the population were estimated to have some form of coverage in 2005.[12] In 2015, 23.7% had individual purchase and 15% was covered by ESHI, with some overlaps.[7] Although most of the population in Malaysia do not have PHI, little is known about the characteristics of this group. This article explores factors associated with not having PHI using data from a community survey in 2015. This provides insights to government and policymakers on subgroups who have limited access to preferential care.

Methods

We used data on adults aged 18 years and above from the National Health and Morbidity Survey (NHMS) 2015, a nationally representative community survey.[7] Respondents were classified as uninsured when they did not have PHI or ESHI. However, they might have guarantee letter, which is public sector coverage for civil servants. Independent variables included characteristics of the individual, household, as well as behavioral and chronic illness status.

Proportions with 95% confidence intervals (CIs) were used to describe uninsured rates and binary logistic regression (enter method) to identify determinants of uninsured status with survey weights applied in Stata 13, with survey tab and logistic commands for the respective analysis. We analyzed percentage of children per household size instead of number of children and number of household members, as latter two variables resulted in collinearity. The model with number of household members and percentage of children per household size resulted in the best fit model (Pearson's correlation coefficient $= 0.2177$), while the Pearson's correlation coefficient between household members and number of children was 0.6934 (highly correlated). Adjustment for

household cluster effect was tested during model development and dropped as there was no differences observed. Odds ratio (OR) and 95% CI of OR were presented for regression analysis. All costs were expressed in MYR and US$ using the average exchange rate for 2015, US$1 equaled to MYR3.907.[16]

Results

In total, 56.6% (95% CI = 54.9, 58.2) was uninsured (Table 1). Differences were seen across age, sex, ethnicity, education, occupation, marital status, geographical strata, household income, household size, home ownership, and chronic illnesses, with higher proportions of uninsured among those aged 60 years and above, female, Malay/other indigenous ethnicity, poorest two quintiles, self-employed, unpaid or retiree, primary or no formal education, and single/widowed/divorced. In contrast, around half of the Chinese, private employee, and richest two quintiles have higher rates of PHI.

In the final model, all the above variables were significant predictors except chronic illnesses (Table 2). Additionally, OR for body mass index and level of physical activity were not significant after adjusting for other variables in the model.

Those aged 50 years and above, females, Malay/other Bumiputra ethnicity, rural, government/semi-government, self-employed, unpaid workers and retirees, unemployed, lower education level, without home ownership and single/widowed/divorced, daily smoker, underweight body mass index, and current drinker had higher likelihood to be uninsured. The likelihood of being uninsured increased with increasing household size while the inversed trend was seen for household income.

Discussion

In a country without social- or community-rated health insurance, there is still a substantial proportion of the population without PHI. Those aged 50 years and above, females, Malay/other Bumiputra ethnicity, rural, government/semi-government, self-employed, unpaid workers and retirees, unemployed, lower education level, without home ownership and single/widowed/divorced, daily smoker, underweight body mass index, and current drinker had higher likelihood to be uninsured. The likelihood of being uninsured increased with increasing household size while the inversed trend was seen for household income. Chronic illnesses did not affect uninsured status.

Although Malaysia introduced measures such as personal income tax relief and stand-alone sale of insurance products policy since 1996,[12] uninsured rate decreased from 85% in 2005[12] to 57% in 2011,[17] and in this study, 56.6%. The likelihood of being uninsured is significantly associated with income and education, similar to China and Singapore.[18,19] This finding is also in line with previous study done based on the same survey conducted in 1996, which found lower income and education were significant factors influencing PHI acquisition.[13] Similarly, the report produced by the Central Bank of Malaysia in 2017 showed the uptake of insurance and *takaful* was low among population from bottom 40% of household income category (B40) as compared with the national population.[20] The median household income was MYR5873 (US$1503), and MYR3166 (US$810) for B40 in 2019.[21] The 2019 household expenditure survey showed that most expenditures were spent on housing, water, electricity, gas and other fuels, food, restaurants, and transportations (68.3%). Only 2.1% was spent on health.[21] With the PHI premiums set to be at least MYR200 (US$51) yearly and continues to increase rapidly,[22] lower income group is less willing and able to pay premiums. This may be explained through the "loss aversion" theory whereby purchasing an additional and nonmandatory item such as a PHI is perceived as a greater monetary loss than the benefit it may offer.[23] Furthermore, public health care in Malaysia is widely available and accessible. In response to this, the government launched PeKa B40 in 2019, a health subsidy initiative aiming to cover some of health expenditures borne by the B40 including health screenings, payment for medical equipment, cancer treatments, and transportation.[24] Another scheme, mySalam was also introduced, offering population with lower incomes a onetime payment for critical illness claim and MYR50/day (US$13/day) of hospitalization benefit, for a maximum 14 days per annum.[25] Both are not equivalent to the PHI and the preferential access benefit that it offers.

Level of education is directly related to the capacity to accumulate and understand health-related information in making decision to purchase health insurance.[26] Lower level of education may restrict understanding or overwhelm an individual, and this could lead to "omission bias" whereby one prefers status quo than making a hard decision.[23] Lower education is also directly related to income, affecting the ability to purchase insurance.

This study showed that those self-employed, unemployed, and retired had higher likelihood of being uninsured compared with private sector employees. This could be partly explained by the fact that many private employers provide ESHI incentives for their workers. However, this is conditional on continued employment.

Among the major ethnic groups in Malaysia, Malay, other Bumiputra, and other ethnic groups had higher likelihood of being uninsured, compared with the Chinese. An analysis of 2006 NHMS data found that race-religion influences individual health insurance demand in Malaysia,[27] similarly in Singapore.[19] Although not the subject of this study and may require further exploration, a possible explanation was the income gap between ethnicities in Malaysia. In 2016, the mean monthly household incomes for Chinese, MYR8750 (US$2240), was 1.4 times higher than Malay and other Bumiputra MYR6267 (US$1604).[21]

Table 1. Private Health Insurance (PHI) Coverage.

| | Total | | Uninsured | | Insured | | | | | |
| | | | | | PHI[a] | | ESHI[b] | | Total insured | |
Variables	Count	Estimated population	%	95% CI	%	95% CI	%	95% CI	%	95% CI
,	19 959	20 238 623	56.6	54.9, 58.2	26.8	25.3, 28.4	16.6	15.4, 17.9	43.3	41.8, 45.1
Sex										
Male	9497	10 449 571	53.1	51.1, 55.0	26.8	25.1, 28.6	20.12	18.4, 22.0	46.9	45.0, 48.9
Female	10 462	9 789 052	60.3	58.5, 62.1	26.8	25.2, 28.6	12.9	11.8, 14.0	39.7	37.9, 41.5
Ethnicity										
Malay	12 349	9 918 392	65.8	64, 67.6	18.5	17.2, 20	15.6	14.5, 16.8	37.8	36.0, 39.5
Chinese	3203	4 759 245	42.1	39, 45.4	52.2	49, 55.4	5.7	4.7, 6.9	59.5	56.3, 62.6
Indian	1410	1 371 927	50.8	46.2, 55.4	35	30.4, 40	14.2	11.7, 17	52.5	47.9, 57.0
Other Bumiputra	1759	2 178 975	73.4	68.9, 77.4	14.7	12, 18	11.9	9, 15.5	31	26.9, 34.4
Others	1238	2 010 084	62.2	55.6, 68.5	7.7	5.6, 10.7	30	24.1, 36.7	40.8	34.2, 47.7
Strata										
Urban	11 518	15 416 827	54.8	52.8, 56.7	31.7	29.8, 33.7	17.2	15.8, 18.6	48.9	46.9, 50.8
Rural	8441	4 821 796	77.3	74.8, 79.6	11.2	9.8, 12.8	14.9	12.3, 17.9	26.1	23.4, 29.0
Citizenship										
Malaysian	18 687	18 181 050	56.3	54.7, 57.8	29.0	27.5, 30.6	14.7	13.7, 15.7	43.7	42.2, 45.3
Non-Malaysian	1272	2 057 573	59.1	52.3, 65.6	7.5	5.3, 10.4	33.4	27.3, 40.1	40.9	34.5, 47.7
Work status										
Government/semi-government	2194	1 924 753	37.1	34, 40.3	44.8	41.6, 48	18.1	15.8, 20.7	62.9	59.7, 66
Private	6110	8 013 108	37.8	35.5, 40.2	31.3	28.9, 33.7	31	28.7, 33.3	62.2	59.9, 64.5
Self-employed	3837	3 402 320	69.4	66.8, 71.9	25.9	23.5, 28.4	4.7	3.8, 5.8	30.6	28.1, 33.2
Unpaid worker	3327	2 884 448	75.1	72.8, 77.4	18.1	16.1, 20.3	6.8	5.7, 8.1	24.9	22.6, 27.2
Retiree	786	609 294	73.9	69.7, 77.8	20.1	16.6, 24.2	5.9	4, 8.8	26.1	22.2, 30.3
Unemployed	3686	3 377 829	80	77.4, 82.4	15.9	13.7, 18.3	4.1	3.2, 5.2	20	17.6, 22.6
Missing	19	26 871	93	60.8, 99.1	7	0.9, 39.2	0	—	7	8.7, 39.2
Education										
No formal	1370	1 179 253	81.5	76.7, 85.5	7	5.3, 9.1	11.5	8.0, 16.4	18.5	14.5, 23.3
Primary	4786	4 107 419	74.8	72.2, 77.3	12.2	10.7, 14.0	12.9	10.8, 15.4	25.2	22.7, 27.8
Secondary	9150	9 349 073	57.8	55.9, 59.68	24.7	23.1, 26.4	17.5	16.1, 19.0	42.2	40.3, 44.1
Tertiary	4398	5 280 862	34.3	32.1, 36.5	47.2	44.7, 49.8	18.5	16.9, 20.2	65.8	63.5, 67.9
Unclassified	216	277 800	60.8	49.7, 70.8	12.9	7.2, 22.1	26.3	17.1, 38.3	39.3	29.2, 50.3
Missing	39	44 216	73.9	50.0, 88.9	11.1	3.3, 31.2	15	5.0, 36.9	26.1	11.1, 50.0
Marital status										
Never married	4194	5 645 620	54.3	51.7, 56.8	25.2	23.2, 27.3	14.7	13.2, 16.2	45.7	43.2, 48.32
Married	13 811	13 165 992	55.2	53.4, 57.0	28	26.3, 29.7	16.7	15.3, 18.1	44.8	43.0, 46.6
Widow/widower/divorcee	1940	1 404 857	78.1	75.3, 80.7	13.7	11.5, 16.3	8.1	6.5, 10.1	21.9	19.3, 24.7
Missing	14	22 154	100	—	—	—	—	—	0	—
Age group, years										
18-29	4909	6 602 553	54.8	52.3, 57.2	25.3	23.1, 27.5	20	18.1, 22	45.2	42.8, 47.7
30-39	4011	4 711 981	46.3	43.7, 48.9	32.8	30.4, 35.3	20.9	18.8, 23.2	53.7	51.1, 56.3
40-49	3666	3 535 319	49	46.4, 51.7	34.1	31.5, 36.9	16.8	15, 18.8	51	48.3, 53.6
50-59	3579	2 777 119	61.9	59.3, 64.5	25.3	23, 27.7	12.8	11.2, 14.6	38.1	35.5, 40.7
60-69	2360	1 635 800	80	77.4, 82.3	14.7	12.6, 17.2	5.3	4.1, 6.8	20	17.7, 22.6
>70	1434	975 851	91.3	89.0, 93.2	6.7	5.1, 8.8	0.2	1.2, 3.3	8.7	6.8, 11
Household income quintile[c]										
Q1	2801	2 367 125	80.5	77.5, 83.2	13.6	11.6, 16.0	5.9	4.4, 7.8	19.5	16.8, 22.5
Q2	3726	3 433 076	74	71.3, 76.4	10.5	9.0, 12.2	15.6	13.3, 18.1	26.1	23.6, 28.7
Q3	4306	4 178 479	63	60.3, 65.6	18.7	16.5, 21.0	18.3	16.2, 20.7	37	34.4, 39.7
Q4	4108	4 422 161	51.5	48.7, 54.3	28.7	26.3, 31.3	19.8	17.7, 22.0	48.5	45.7, 51.3
Q5	5018	5 837 782	35.9	33.5, 38.3	46.2	43.5, 48.9	17.9	15.9, 20.2	64.1	61.7, 66.5
Number of household members										
1	1442	1 551 302	51.9	47.8, 55.9	29.5	25.8, 33.4	18.7	15.4, 22.5	48.1	44.1, 52.2
2	3550	3 327 297	58.2	55.1, 61.2	26.4	23.8, 29.1	15.4	13.3, 17.8	41.8	38.9, 44.9
3	3638	3 646 727	56.6	53.7, 59.4	26.5	23.9, 29.2	16.9	15.0, 19.1	43.3	40.6, 46.3
4	3892	4 102 102	53.1	50.2, 55.9	30.4	27.6, 33.3	16.6	14.7, 18.7	46.9	44.1, 49.8
5	2930	3 086 994	56.4	53.1, 59.6	27.9	24.8, 31.2	15.7	13.5, 18.2	43.6	40.4, 46.9
6	2022	2 011 063	57.5	58.0, 66.9	24.8	21.6, 28.3	17.7	14.9, 20.9	42.5	39.0, 46.1
≥7	2485	2 513 138	62.6	58.0, 66.9	20.8	17.5, 24.6	16.7	13.3, 20.7	37.5	33.1, 42.1
Percentage of children in household										
<50%	16 545	16 855 997	57.5	55.8, 59.3	26.3	24.7, 28.0	16.2	14.9, 17.6	42.5	40.7, 44.2
>50%	3414	3 382 626	51.8	48.9, 54.7	29.6	26.9, 32.4	18.6	16.4, 21.0	48.2	45.3, 51.1

(continued)

Table 1. (continued)

			Uninsured		Insured					
	Total				PHI[a]		ESHI[b]		Total insured	
Variables	Count	Estimated population	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Home ownership										
Owned	15083	14361218	58	56.3, 59.8	29.7	28.0, 31.5	12.3	11.4, 13.2	42	40.3, 43.7
Staff quarter	1182	1000706	42.2	34.9, 49.8	19	14.0, 25.3	38.8	30.6, 47.7	57.8	50.2, 65.1
Rented	2849	3942160	56.6	53.2, 59.9	20.5	18.0, 23.3	22.9	20.2, 25.8	43.4	40.1, 46.9
Others	614	694475	49.1	38.6, 59.6	12.2	8.2, 17.6	38.8	28.3, 50.4	50.9	40.4, 61.4
Missing	231	240064	52.1	42.3, 61.7	31.8	23.6, 41.4	16.1	10.6, 23.7	47.9	38.2, 57.7
Body mass index										
Underweight	1107	1259036	63.2	59.1, 67	24.9	21.4, 28.8	11.9	9.6, 14.7	36.8	33, 40.9
Normal	7796	8553140	55.7	53.6, 57.9	26.7	24.8, 28.7	17.6	15.8, 19.5	44.3	42.1, 46.4
Overweight	5949	5634849	55.8	53.5, 58.1	27.8	25.9, 29.9	16.4	14.8, 18.1	44.2	41.9, 46.5
Obese	3645	3313410	57.6	55.1, 60.1	25.2	22.9, 27.5	17.2	15.5, 19.1	42.4	39.9, 44.9
Missing	1462	1478188	56.6	52.1, 60.6	29.1	25.1, 33.4	14.5	12.0, 17.5	43.4	41.8, 45.1
Drinking status										
Nondrinker	17905	17243244	58.7	57.1, 60.2	16.9	23, 25.9	24.5	15.7, 18.2	41.3	39.8, 42.9
Ex-drinker	226	309938	55.2	45.8, 64.3	30.4	227, 39.4	14.3	8.4, 23.4	44.8	35.7, 54.2
Current drinker	1064	1688560	36.8	32.3, 41.5	48.4	43.5, 53.3	14.8	12.2, 18	63.2	58.5, 67.7
Unclassified	715	934526	51.9	44.9, 58.9	32	26.7, 38	16	10.3, 24.1	48.1	41.1, 55.1
Missing	49	62355	87.4	64.5, 96.4	1.9	0.3, 11.8	10.7	3.3, 29.3	12.6	3.7, 35.5
Smoking status										
Daily smoker	3970	4389034	57.6	55.0, 60.2	19.7	18, 21.6	22.6	20.3, 25.1	42.4	39.8, 45
Occasional smoker	379	457595	53.3	46.5, 64.0	26.4	20.8, 32.9	20.2	15.5, 26.1	46.7	40, 53.5
Former smoker	472	493579	55.8	49.7, 61.6	24.5	19.9, 29.7	19.8	15.5, 24.9	44.2	38.4, 50.3
Never smoked	15104	14853046	56.3	54.6, 58	29.1	27.4, 30.9	14.6	13.5, 15.9	43.7	42, 45.4
Missing	34	45369	97	80.7, 99.6	0	—	3	3.9, 19.3	3	0.4, 19.3
Physical activity										
Active	13290	13358360	55.8	54, 57.6	26.5	24.9, 28.1	17.7	16.3, 19.3	44.2	42.4, 46
Inactive	6409	6596977	57.9	55.7, 60	27.9	25.8, 30	14.3	12.9, 15.8	42.1	40, 44.3
Missing	260	283286	56.6	54.9, 58.2	20.7	14.5, 28.7	17.2	11.7, 24.4	37.9	29.5, 47.0
Hypertension										
No	12711	14088532	52.7	50.9, 54.5	29.3	27.5, 31.2	18	16.6, 19.5	47.3	45.5, 49.1
Yes	7224	6114010	65.3	63.3, 67.2	21.2	19.6, 22.9	13.5	12.2, 14.9	34.7	32.8, 36.7
Missing	24	36081	96.3	76.1, 99.5	0	—	3.8	0.5, 23.9	3.8	0.5, 23.9
Diabetes mellitus										
No	15706	16672680	54.6	52.9, 56.4	28	26.4, 29.6	17.4	16, 18.8	45.4	43.6, 47.1
Yes	4229	3529862	65.4	62.8, 67.9	21.7	19.5, 24	13	11.5, 14.7	34.6	32.2, 37.2
Missing	24	36081	96.3	76.1, 99.5	0	—	3.8	0.5, 23.9	3.8	0.5, 23.9
Dyslipidemia										
No	9421	10561034	55.7	53.7, 57.7	26.9	25.2, 28.7	17.4	15.9, 19	44.3	42.3, 46.3
Yes	10514	9641508	57.4	55.6, 59.2	26.8	25.1, 28.6	15.8	14.5, 17.2	42.6	40.8, 44.4
Missing	24	36081	96.3	76.1, 99.5	0	—	3.8	0.5, 23.9	3.8	0.5, 23.9

Abbreviations: ESHI, employer-sponsored health insurance; CI, confidence interval.
[a]Overall, 28.1% (95% CI = 25.9-30.5) of those with PHI have ESHI.
[b]Excluded are respondents with PHI.
[c]Household income was calculated based on total monthly household income and the respondents were divided into quintiles.

In this study, those aged 50 and above were more likely to be uninsured, a finding observed in other countries, in which the likelihood of being uninsured increases with age.[28,29] Lower insurance coverage among older age group may be related to the relative young market of PHI in Malaysia, higher premium, risk stratification, and age limit that increased from 60 to 70 years in 2005.[12] This inadvertently leaves the older with less choices, limiting them to public health care if they are unable to afford private services.

Household size and composition affect insurance status. The household composition of adult to child ratio, with lower proportion of children, larger households, and females were more likely to be uninsured. In China, Singapore, and England, females were also less likely to be insured.[18,19,29,30] As the study assessed the coverage of PHI as individuals and not as a family with cross-coverage, there is a possibility of underestimation, as someone could already covered by a family-based health insurance but was unaware of this and not recorded.

Those who live in rural areas were significantly more likely to be uninsured than those living in urban areas, similar to China.[18] A likely contributing factor is private hospital distribution that tend to be clustered in urban areas, thus a disincentive to those living in rural area to own PHI.[23] The study showed there was no significant association between being uninsured and chronic illnesses, suggesting "adverse

Table 2. Factors Affecting Uninsured Status.

Variables	Crude OR (95% CI)	Adjusted OR (95% CI)	P
Sex			
Male	1.000 (ref)	1.000 (ref)	
Female	1.343 (1.249, 1.445)	1.194 (1.057, 1.349)	.004**
Ethnicity			
Chinese	1.000 (ref)	1.000 (ref)	
Malay	2.419 (2.072, 2.824)	2.546 (2.114, 3.065)	<.0001***
Indian	1.329 (1.072, 1.647)	1.242 (0.958, 1.611)	.101
Other Bumiputra	3.265 (2.584, 4.126)	2.504 (1.963, 3.195)	<.0001***
Others	2.133 (1.579, 2.882)	2.523 (1.835, 3.469)	<.0001***
Strata			
Urban	1.000 (ref)	1.000 (ref)	
Rural	2.706 (2.293, 3.193)	1.408 (1.192, 1.663)	<.0001***
Home ownership			
Owned	1.000 (ref)	1.000 (ref)	
Staff quarters	0.529 (0.386, 0.724)	0.501 (0.338, 0.742)	.001**
Rented	0.942 (0.811, 1.095)	1.31 (1.114, 1.54)	.001**
Others	0.697 (0.456, 1.067)	0.522 (0.339, 0.805)	.003**
Work status			
Private employee	1.000 (ref)	1.000 (ref)	
Government/semi-government	0.971 (0.828, 1.138)	1.441 (1.19, 1.746)	<.0001***
Self, employed	3.736 (3.262, 4.279)	3.222 (2.785, 3.728)	<.0001***
Unpaid worker/homemaker	4.974 (4.337, 5.704)	3.431 (2.919, 4.032)	<.0001***
Retiree	4.669 (3.745, 5.821)	2.694 (2.027, 3.581)	<.0001***
Unemployed	6.593 (5.588, 7.778)	3.458 (2.839, 4.212)	<.0001***
Education			
Tertiary	1.000 (ref)	1.000 (ref)	
No formal education	8.447 (6.249, 11.418)	2.302 (1.675, 3.164)	<.0001***
Primary	5.709 (4.908, 6.641)	2.672 (2.209, 3.232)	<.0001***
Secondary	2.629 (2.365, 2.924)	1.67 (1.462, 1.909)	<.0001***
Unclassified	2.971 (1.889, 4.673)	1.928 (1.141, 3.256)	.014*
Marital status			
Married	1.000 (ref)	1.000 (ref)	
Never married	0.963 (0.87, 1.066)	1.476 (1.261, 1.728)	<.0001***
Widow/widower/divorcee	2.901 (2.457, 3.425)	1.24 (1.004, 1.531)	.045*
Age group, years			
30-39	1.000 (ref)	1.000 (ref)	
18-29	1.405 (1.248, 1.581)	1.019 (0.875, 1.186)	.813
40-49	1.117 (0.981, 1.272)	0.95 (0.816, 1.107)	.512
50-59	1.887 (1.652, 2.156)	1.39 (1.152, 1.677)	.001**
60-69	4.637 (3.913, 5.494)	2.391 (1.894, 3.017)	<.0001***
70/max	12.219 (9.295, 16.062)	5.914 (4.054, 8.629)	<.0001***
Household income quintile			
Q4	1.000 (ref)	1.000 (ref)	
Q1	3.889 (3.146, 4.808)	2.487 (1.937, 3.192)	<.0001***
Q2	2.671 (2.285, 3.122)	2.503 (2.082, 3.009)	<.0001***
Q3	1.604 (1.396, 1.843)	1.628 (1.4, 1.894)	<.0001***
Q5	0.526 (0.456, 0.607)	0.578 (0.493, 0.678)	<.0001***
Number of household members			
1	1.000 (ref)	1.000 (ref)	
2	1.29 (1.068, 1.56)	1.634 (1.299, 2.055)	<.0001***
3	1.21 (0.997, 1.468)	1.977 (1.545, 2.529)	<.0001***

(continued)

Table 2. (continued)

Variables	Crude OR (95% CI)	Adjusted OR (95% CI)	P
4	1.05 (0.87, 1.268)	2.649 (2.06, 3.408)	<.0001***
5	1.199 (0.978, 1.469)	2.602 (1.973, 3.431)	<.0001***
6	1.254 (1.011, 1.556)	2.815 (2.123, 3.732)	<.0001***
>7	1.55 (1.212, 1.982)	3.821 (2.818, 5.181)	<.0001***
Percentage of children in household			
<50%	1.000 (ref)	1.000 (ref)	
≥50%	0.793 (0.702, 0.897)	0.668 (0.574, 0.779)	<.0001***
Chronic illnesses			
Diabetes mellitus			
No	1.000 (ref)	1.000 (ref)	
Yes	1.568 (1.401, 1.756)	1.079 (0.939, 1.24)	.281
Hypertension			
No	1.000 (ref)	1.000 (ref)	
Yes	1.687 (1.548, 1.837)	1.104 (0.981, 1.242)	.101
Hypercholesterolemia			
No	1.000 (ref)	1.000 (ref)	
Yes	1.072 (0.992, 1.159)	0.908 (0.819, 1.007)	.068
Smoking status			
Nonsmoker	1.000 (ref)	1.000 (ref)	
Daily smoker	1.057 (0.955, 1.169)	1.268 (1.09, 1.474)	.002**
Occasional smoker	0.888 (0.681, 1.157)	0.987 (0.712, 1.368)	.936
Former smoker	0.98 (0.771, 1.245)	0.945 (0.703, 1.27)	.707
Body mass index			
Normal	1.000 (ref)	1.000 (ref)	
Underweight	1.362 (1.143, 1.624)	1.249 (1.017, 1.535)	.034*
Overweight	1.002 (0.906, 1.107)	0.963 (0.853, 1.087)	.54
Obese	1.079 (0.961, 1.212)	1.016 (0.883, 1.168)	.825
Alcohol intake status			
Nondrinker	1.000 (ref)	1.000 (ref)	
Ex, drinker	0.868 (0.594, 1.267)	1.262 (0.749, 2.126)	.382
Current drinker	0.409 (0.337, 0.498)	0.67 (0.532, 0.845)	.001**
Unclassified	0.761 (0.576, 1.005)	0.993 (0.754, 1.307)	.959
Physical activity status			
Active	1.000 (ref)	1.000 (ref)	
Inactive	1.087 (0.997, 1.185)	1.035 (0.933, 1.148)	.52

Abbreviations: OR, odds ratio; CI, confidence interval.
*P < .05. **P < .01. ***P < .001. Pseudo R^2: 0.2366.

selection" may not contribute substantially to PHI purchase in Malaysia. A study using NHMS 1996 and 2006 data found similar findings.[13]

As the health insurance is risk rated, these vulnerable subgroups have limited health care options and may likely resort to public facilities or have to pay OOP for private care. They would need to tap into financial resources such as savings to enable private inpatient care, with the public sector a crucial safety net as the OOP for private is higher than public (see the appendix). Without PHI, majority of the population utilizes public health sector, causing more crowding and congestion in the already pressured public health facilities.[4,6] Coupled with increasing health expenditures and concerns on the sustainability of continuous subsidy on public health

services, the government is considering more sustainable health financing models for the future.[6]

It is well known that when health insurance is not properly regulated, it may exacerbate inequalities, allowing only those who can afford or those with low risk to have coverage and preferential access to private health care. This increases the risk of cream skimming whereby insurance provider has the ability to "choose" customers who will increase their profits and cost escalation for the country.[31] It is thus important to look at the pattern and factors associated with not having PHI to understand the barriers and difficulties in widening the coverage.

Between 2016 and 2019, MHI claims grew by 11.6% a year.[32] With the introduction of the Private Health Care

Facilities and Services Act 1998, all PHI suppliers must be registered with the managed care organizations for monitoring. The guidelines were revised in 2005 to increase policyholders' protection including introduction of mandatory minimum free look period and reduced waiting time for claims.[12] There is a plan to further increase the transparency of the various costs covered and adopting co-payments or deductibles to allow policyholders better control on the costs of their health care decisions.[32]

The use of a large nationally representative sample in this survey provides community-level estimation of health insurance status for the individual. We used survey set function to adjust for the survey design. However, this survey may underestimate individuals with family health insurance if the individual is not aware of the coverage. This could explain why household clustering effect was not observed in the analysis. The cross-sectional nature of this study did not allow temporal effect analysis on certain variables such as chronic illnesses. Although the factors included in the survey were extensive, it did not cover factors specifically associated with health insurance coverage such as knowledge on health insurance, size effect of insurance premiums, self-assessment of health, and exemption from payment within universal health coverage. Moreover, this study did not explore the effect of PHI on health care utilization and impact toward the Malaysian health system landscape, perhaps areas for future study.

Conclusion

A substantial proportion of population in Malaysia did not have PHI, and vulnerable subgroups were more likely to be uninsured. Therefore, access to private health care is constrained, which translates into loss of opportunities toward having preferential access to timely care, choice of provider and care options, and reduced waiting time.

Appendix

Comparison of Out-of-Pocket (OOP) Payment for Public and Private Inpatient Care.[a]

OOP		Public	Private
Median (Q1-Q3)	MYR	80 (36-200)	3000 (1200-6500)
	US$	20 (9-51)	768 (307-1664)

Abbreviation: MYR, Malaysian Ringgit.
[a] The median OOP reported for private is 37.5 times higher than public inpatient care. This analysis uses data from the National Health and Morbidity Survey 2015, excluding zero OOP payment.[17]

Ethics Approval

The NHMS survey protocol was approved by the Medical Research and Ethics Committee (MREC), Ministry of Health Malaysia (NMRR-14-1064-21877).

Informed Consent

All participants provided written informed consent prior to interviews during the National Health and Morbidity Survey 2015's data collection.

ORCID iD

Nur Zahirah Balqis-Ali [iD] https://orcid.org/0000-0002-1590-5457

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