

Factors associated with the usage of health insurance among cancer patients in public hospitals in a middle-income country

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ABSTRACT

Introduction: Private health insurance (PHI) plays an important supplementary role on top of the existing subsidised health financing system to prevent heavy reliance on out-of-pocket (OOP) expenses, especially in diseases with high costly treatment. This study was done to examine the factors associated with PHI usage among cancer patients and its associated influencing factors in Malaysia.

Materials and Methods: This cross-sectional study was conducted in three Malaysian public hospitals using a multi-level sampling technique to recruit 630 respondents. A validated self-developed four-domain questionnaire which includes one domain for health insurance was used to collect the relevant data.

Results: Approximately 31.7% of the respondents owned PHI. The PHI usage was significantly higher among male respondents ($p=0.035$), those aged 18–40 years old ($p<0.001$), Indian and Chinese ethnicities ($p=0.002$), with tertiary education level ($p<0.001$), employed ($p<0.001$), working in the private sector ($p<0.001$), high household income (T20) ($p<0.001$), home near to the hospital ($p=0.001$) and medium household size ($p<0.001$). The significant predictive factors were age 18–40 years aOR 3.01 (95% CI: 1.67–5.41), age 41–60 years aOR 2.22 (95% CI 1.41–3.49), medium (M40) income aOR 2.90 (95% CI: 1.92–4.39) and high (T20) income aOR 3.86 (95% CI: 1.68–18.91), home near to the hospital aOR 1.68 (95% CI: 1.10–2.55), medium household size aOR 2.20 (95% CI: 1.30–3.72) and female head of household aOR 1.79 (95% CI: 1.01–3.16). The type of cancer treatment, the location of treatment, prior treatment in private healthcare facilities and existence of financial coping mechanisms also were significant factors in determining PHI usage among cancer patients in this study.

Conclusion: Several factors are significantly associated with PHI usage in cancer patients. The outcome of this study can guide policymakers to identify high-risk groups which need supplementary health insurance to bear the cost for their cancer treatment so that a better pre-payment health financing system such as a national health insurance can be formulated to cater for these groups.

KEYWORDS:

Health insurance, Health insurance in cancer, Health insurance in Malaysia

INTRODUCTION

Insurance is a promise of compensation for specific potential future losses in exchange for a periodic payment.¹ There are many types of insurance schemes available, namely life insurance, medical/health insurance, automobile insurance, property insurance and disability insurance. Health insurance is a programme designed to cover against critical illness occurrences, hospitalisation, medical, surgical, accident and other health risks expenses that are incurred by the insured (person covered). It is a critical pillar of health care financing and the main driver in achieving UHC in most nations. Health insurance provides financial access care and helps to protect the populations against high treatment cost. Moreover, health insurance protects households against large out-of-pocket expenses resulting from catastrophic illnesses.

Typically, insurance is voluntarily purchased by individuals, who pay different premiums depending on the type of health insurance and the level of coverage. Health insurance can either reimburse the insured for expenses incurred from illness or injury or pay to the healthcare provider directly (e.g. hospitals). Health insurance concept is to create a pool of fund through contributions made by individual who seeks for protection. Basically, this risk-sharing concept is a contract between the insured and the insurance provider, whereby the insurance companies will act as a trustee and if any person suffers a loss, the insurer will compensate out the contribution from the pool of fund.²

Malaysia is an upper-middle-income country that adopts the provision of subsidised public health services to all citizens through national taxation.³ Primary care at public health clinics costs only USD0.24, which includes medication.⁴ The Ministry of Health Malaysia (MOH) reported the country's total health expenditure (THE) for 2019 was RM64.3 billion or 4.3% of gross domestic product (GDP).⁵ The per capita expenditure on health was RM1974. Public sources of financing remained higher than private, with public sector contributing 52.5%, while private source of financing was 47.5%. The MOH expenditure on health was the highest source of funding with 44.9% of THE, followed by out-of-pocket (OOP) expenditure with 35% of THE. The highest health expenditure was in hospitals at RM35.5 billion or 55% of THE followed by ambulatory care providers.

The expenditure on health care in Malaysia has been increasing over the years and it brings a challenge not only for the Malaysian population, but also to the government

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and the insurance providers. With the rising cost of healthcare, it has increased the demand and expectation on health financial providers. The reasons for increase in the medical costs are the increase in the communicable and non-communicable diseases, the ageing population and the effects of globalisation where diseases can be transmitted to different countries within a short period of time. Furthermore, newer and better medications and treatment modalities will be expensive and with these improved treatment sciences, many diseases can be treatable and curable. Consequently, these increasing trends of health care expenditure will simultaneously increase the out-of-pocket expenditure.

The public health system is currently overburdened and underfunded with some of the more expensive treatments that need to be paid for by the patients.⁶ This in the long run can overburden the government and subsequently heavy reliance on out-of-pocket expenditures expenses due to the additional costs of treatment, which are not covered or partially covered by the subsidised system may lead to catastrophic health costs and a decline in individual economic status. However, given that health reform by adopting a national health insurance is currently not yet implemented in Malaysia due to various reasons, some patients need to be supplemented through a voluntary pre-payment scheme like PHI, on top of the existing subsidised health financing through the national taxation, to prevent heavy reliance on OOP. Through these roles, PHI also allows greater access to private health care that offers preferential choice for timely care, provider, care options and waiting time, which may contribute towards health and well-being.⁷

The latest available data reported the proportion of PHI uptake in Malaysia at 22% in 2019.⁸ This proportion is considerably high when compared to China and Brazil, which reported lower proportions of PHI coverage of 5.0% and 13%, respectively.^{9,10} It is important to note, however, that the health financing mechanisms in both countries were dominated by mandatory health insurance schemes, which serve little need for voluntary PHI purchasing. There are also instances for examples in France where the PHI coverage was as high as 86% because the statutory health insurance only covers up to 75% of THEs, thus the complementary PHI is required to reimburse co-payments and medical products or services not covered by the public healthcare system.¹¹

In spite of all this, a mandatory social health insurance has not been implemented in Malaysia, although the planning for it has been in the process for many years. Although the government has introduced Peka B40 dan MySalam health subsidy initiatives to lower income groups, both initiatives are not equivalent to the PHI and the preferential access benefit that it offers. Additionally, the PHI coverage in Malaysia is still low, and the cause of PHI insufficiency is probably due to lack of knowledge regarding the importance of PHI and feeling unaffordable to purchase PHI because the premiums can vary greatly depending on the extent and duration of coverage. And since PHI is risk-rated, increasing age or individuals with pre-existing conditions may either be charged higher premiums or precluded from purchase.¹² The report produced by the Central Bank of Malaysia in 2017 showed the uptake of insurance and *takaful* was low among

the population from bottom 40% of household income category (B40) as compared to the national population.¹³ With the PHI premiums set to be at least MYR200 (USD51) yearly and continues to increase rapidly,¹⁴ lower income group is less willing and able to pay premiums.

Cancer is among the leading causes of morbidity and mortality worldwide. The number of new cancer cases in Malaysia is around 48,639 in 2020 and these numbers increase significantly within the ageing population, those living unhealthy lifestyles and those with exposure to carcinogens substances.¹⁵ Often times, public health system requires longer waiting periods for receiving treatment. The opportunity to return to health is higher and the probability of death can be reduced in a disease like cancer if the patients can receive treatment as soon as possible. For example, a chance to recover for Stage I cancer is between 90% and 95%, while the opportunity to cure Stage IV cancers is only about 15%. Hence, many people will choose the private health system to seek the best possible treatment, although the cost of private health spending is more expensive.¹⁶

The purpose of this paper was to examine the factors associated with PHI ownership and usage among cancer patients in Malaysia. This study also highlights the prevalence of PHI among the cancer patients in an attempt to help inform policymakers and researchers to pay attention to PHI and the role it can play in the public-private healthcare systems partnerships. It is hoped that inferences from the study can guide policymakers to identify high-risk groups which need supplementary health insurance to bear the cost for their cancer treatment so that a better pre-payment health financing system such as a national health insurance can be formulated to cater for these groups. By determining which factors most influence individuals' health insurance purchase decisions, it can be instrumental in offering new information for the policymakers to design more effective programs for patients who need health insurance.

MATERIALS AND METHODS

The study was conducted in three public hospitals with oncology services in Malaysia, namely National Cancer Institute (NCI), Hospital Kuala Lumpur (HKL) and Hospital Canselor Tuanku Muhriz (HCTM), all located in Klang Valley (KV), central region West Malaysia, in which 30% of cancer cases in Malaysia are treated.¹⁷ The three hospitals under the study are national referral centres for cancer cases from all over the country and they all have radiotherapy and oncology departments that provide radical and palliative treatments to cancer patients in the country.

This is a cross-sectional study conducted from February 2020 to February 2021. The sampling in this quantitative research was done using multi-level sampling methods, whereby the hospital was chosen using convenient sampling. This was followed by purposive sampling of the oncology department, universal sampling of patients at the inpatient and outpatient services of the oncology department, and subsequently systematic sampling of patients at the department.

The total number of samples from all three hospitals calculated using the Lwanga dan Lemeshow (1991) formula to calculate sample size for two proportions was 630. The total number of samples was distributed equally among the three hospitals making the number of samples included in this study from each hospital to be 210. The inpatient and outpatient samples were distributed equally. The ward admission lists and clinic/day-care/radiotherapy clinic attendance lists were used as a basis to recruit the inpatient and outpatient samples in the department. Informed consent was obtained from the respondents, confidentiality reassured. Ethical clearance was received from the Malaysian Research Ethical Committee and permission to conduct data collection was approved by the hospital directors.

A self-developed questionnaire and document review of the patient's case notes and hospital documents were the study tools used in this study. The questionnaire consisted of four domains, namely the demographic and socio-economic domain, the disease and treatment domain, the health financing domain and the health insurance domain. The questionnaire was validated using content and face validity, whereby the content validation of the questionnaire was conducted by doing literature reviews on research papers/journals/books related to this study to ensure all the important and associated PHI factors were included in this study, and then inputs from two health economists and a cancer institute deputy director were taken.

Face validation was then conducted whereby pre-testing of the questionnaire on 20 respondents who were not part of the study sample was done to make sure the sentences and questions in the questionnaire were understood by the respondents. Family members that took care of the patients and the hospital staff in-charge of the cancer patients were also interviewed when necessary to get additional data. All the sources of household income and household expenses including the health expenses were accounted for in the questionnaire. All income and expenditure were reported in Malaysian currency RM (RM1 = USD0.24).

The inclusion criteria were Malaysian citizen, aged 18 and above, with any types or stages of cancer. Patients who did not give consent, mentally unstable, unconscious or unable to communicate were excluded from this study. The household income groups were categorised into lower income (B40), middle income (M40) and high income (T20) groups according to the household income expenditure. Home distance from the hospital was categorised into within Klang Valley (near to hospital) and outside Klang Valley (far from hospital). The household size was categorised into 1–2 members (small size), 3–5 members (medium size) and more than five members (large size).

The types of cancer were categorised according to their primary location in the body. The cancer duration was divided into less than 1 year (short duration), 1–2 years (moderate duration) and more than 2 years (long duration). The cancer stage was categorised into Stage I to Stage IV based on the existing cancer staging criteria. The types of treatment were categorised into symptomatic/follow-up treatment, chemotherapy, radiotherapy and a combination

of chemo-radiotherapy treatments. The frequency of treatment per year was divided into 1–3 (infrequent), 4–11 (frequent) and 12 sessions or more (very frequent). Guarantee Letter (GL) is a document provided by an employer or insurer for a patient to obtain a waiver of the treatment payment required by the hospital. Health financial aid is defined as any financial assistance or contribution in the form of monetary assistance, payment guarantees, cost-sharing arrangements, subsidies or welfare payments from family, friends, government organisations or non-governmental organisations which is specific for the purpose of paying for healthcare.

Respondents were asked to state how much health insurance premium they were paying per month, and these were divided into less than RM100, RM100 to RM250, RM251 to RM500 and more than RM500. As a social health insurance is not available yet in Malaysia, private health insurance (PHI) was studied in this paper. PHI type was categorised into individual purchase and employer-sponsored health insurance. Types of location covered were divided into inpatient only, outpatient only and both inpatient and outpatient services. Type of health services covered were either for all types of services (including for surgery) or not. Those without health insurance were put into the "Not applicable" category.

The data were analysed using Statistical Package for Social Sciences (SPSS 22.0) version 22.0 software. The descriptive analysis was done using frequency distribution, central tendency and variability of a data set, while the bivariate analysis was done using the two-sided chi-square test, followed by multivariate analysis using binomial logistic regression. The fit of the logistic regression model was tested using Omnibus, Hosmer and Lemeshow and Nagelkerke R-Squared tests.

RESULTS

Numerical Data Analysis

The mean age of the respondents was 54.25 years old (SD ± 12.52), and the mean household size was 4.1 (SD ± 1.84). Table I reveals the mean, median, standard deviation and inter-quartile (IQR) values of the age, household size, income and expenditures of the respondents. The monthly median income, household expenditure and healthcare expenditure were RM3320 (IQR = 3500), RM2587 (IQR = 2466) and RM350 (IQR = 441), respectively (RM1 = USD0.24).

PHI Analysis

According to the findings in Table II, only 31.7% of the respondents in this study have PHI, while majority (68.3%) did not have PHI. Majority of the respondents with PHI indicated that they pay RM100 to RM250 per month for the insurance premium, 7.1% pay RM251 to RM500 per month, 4.1% pay less than RM100 per month while 2.4% pay more than RM500 per month. The percentage of having individual purchase PHI was slightly higher (17.8%) compared to employer-sponsored PHI (14.0%).

Majority (27.6%) of the respondents with PHI were covered for both inpatient and outpatient services, while coverage for

Table I: Numerical data analysis of the respondents

				Interquartile range		
	Mean	Median	SD	25th	50th	75th
Age	54.25	56.00	12.52	46.00	56.0	64.00
Household size	4.1	4.0	1.84	3.0	4.0	5.0
Monthly income (RM)	4369	3320	3652	2000	3320	5500
Monthly expenditure (RM)	3136	2587	2316	1578	2587	4044
Monthly health expenditure (RM)	557	350	758	200	350	641

* RM1 = USD0.24
SD = standard deviation.

Table II: Private health insurance (PHI) analysis (n = 630)

	Frequency	Percentage
Presence of PHI		
Yes	200	31.7
No	430	68.3
Amount of monthly premium		
< RM100	26	4.1
RM100–RM250	114	18.1
RM251–RM500	45	7.1
> RM500	15	2.4
Not applicable	430	68.3
Type of PHI		
Individual purchase	112	17.8
Employer sponsored	88	14.0
Not applicable	430	68.3
Types of location		
Inpatient only	18	2.9
Outpatient only	8	1.3
Both inpatient and outpatient	174	27.6
Not applicable	430	68.3
Types of health services		
All services	67	10.6
Certain services only	133	21.1
Not applicable	430	68.3

* Average monthly insurance premium = RM263.28
Monthly insurance premium = minimum RM30 ; maximum RM3300

inpatient only and outpatient only were much less (2.9% and 1.3%). In addition, 21.1% of the respondents with PHI were covered for certain health services only while 10.6% were covered for all health services including surgery. The study also found the average monthly health insurance premium was RM263.28, whereby the minimum and maximum amount of the monthly insurance premium was RM30 and RM3300, respectively.

Descriptive and Bivariate Analysis

The descriptive analysis in Table III shows that the majority of the respondents were female (72.2%), aged 41–60 years old (51.6%), Malay ethnicity (69.7%), married (76.0%), had secondary school education (50.8%), unemployed (51.1%), other employment sector (73.3%), lower income group (65.2%), home near the hospital (62.9%), from urban areas (82.9%), not a single parent (86.0%), medium household size (58.9%), had male as head of household (87.1%), cancer duration less than 1 year (51.3%), outpatient treatment location (72.7%), without surgery (53.8%), without prior treatment in private healthcare facilities (87.9%), with other chronic diseases (52.9%), without disability (93.8%), frequent treatment (51.9%), without GL (60.2%), without financial health aides (93.2%) and with financial coping mechanism (58.4%).

The bivariate analysis in Table III shows that health insurance was significantly higher in the groups with male respondents ($p=0.035$), those aged 18–40 years old ($p<0.001$), Indian and Chinese ethnicities ($p=0.002$), tertiary education level ($p<0.001$), employed ($p<0.001$), working in the private sector ($p<0.001$), high household income (T20) ($p<0.001$), home near to the hospital ($p=0.001$), medium household size ($p<0.001$), undergoing combination chemo-radiotherapy ($p=0.022$), inpatient treatment location ($p<0.001$), without treatment in private healthcare facility ($p<0.001$) and with financial coping mechanism ($p<0.001$).

Logistic Regression Analysis

The logistic regression analysis in Table IV shows the results were significant in the groups with respondent age 18–40 years aOR 3.01 (95% CI 1.67–5.41), age 41–60 years aOR 2.22 (95% CI 1.41–3.49), M40 income aOR 2.90 (95% CI 1.92 – 4.39), T20 income aOR 3.86 (95% CI 1.68–18.91), within Klang Valley (home near to hospital) aOR 1.68 (95% CI 1.10–2.55), medium household size aOR 2.20 (95% CI 1.30–3.72), female head of household aOR 1.79 (95% CI 1.01–3.16), follow-up/symptomatic treatment aOR 5.56 (95% CI 1.73–17.89), chemotherapy treatment aOR 4.40 (95% CI 1.40–13.82), radiotherapy treatment aOR 6.82 (95% CI 2.07–22.47), outpatient treatment location aOR 1.97 (95% CI 1.21–3.19), prior treatment in private healthcare facilities aOR

Table III: Descriptive and bivariate analysis of study population

	Descriptive Analysis n (%)	Bivariate Analysis Health insurance		p value
		Yes n (%)	No n (%)	
Gender				0.035*
Male	175 (27.8)	77 (44.0)	98 (56.0)	
Female	455 (72.2)	159 (34.9)	296 (65.1)	
Age				< 0.001*
18–40	99 (15.7)	49 (49.5)	50 (50.5)	
41–60	325 (51.6)	137 (42.2)	188 (57.8)	
> 60	206 (32.7)	50 (24.3)	156 (75.7)	
Ethnicity				0.002*
Malay	439 (69.7)	145 (33.0)	294 (67.0)	
Chinese	106 (16.8)	52 (49.1)	54 (50.9)	
Indian	73 (11.6)	36 (49.3)	37 (50.7)	
Others	12 (1.9)	3 (25.0)	9 (75.0)	
Marital status				0.876
Single	52 (8.3)	19 (36.5)	33 (63.5)	
Married	479 (76.0)	182 (38.0)	297 (62.0)	
Divorced/ Widowed	99 (15.7)	35 (35.4)	64 (64.6)	
Education level				< 0.001*
None	18 (2.9)	7 (38.9)	11 (61.1)	
Primary school	109 (17.3)	28 (25.7)	81 (74.3)	
Secondary school	320 (50.8)	96 (30.0)	224 (70.0)	
College/University	183 (29.0)	105 (57.4)	78 (42.6)	
Employment status				< 0.001*
Employed	164 (26.0)	91 (55.5)	73 (44.5)	
Self-employed	38 (6.0)	15 (39.5)	23 (60.5)	
Retired/Pensioner	106 (16.8)	31 (29.2)	75 (70.8)	
Unemployed	322 (51.1)	99 (30.7)	223 (69.3)	
Employment sector				< 0.001*
Government	69 (11.0)	37 (53.6)	32 (46.4)	
Private	99 (15.7)	56 (56.6)	43 (43.4)	
Others	462 (73.3)	143 (31.0)	319 (69.0)	
Household income				< 0.001*
B40	411 (65.2)	109 (26.5)	302 (73.5)	
M40	183 (29.0)	101 (55.8)	80 (44.2)	
T20	36 (5.7)	26 (68.4)	12 (31.6)	
Home distance from hospital				0.001*
Near (within Klang Valley)	396 (62.9)	167 (42.2)	229 (57.8)	
Far (outside Klang Valley)	234 (37.1)	69 (29.5)	165 (70.5)	
Home area				0.065
Rural	108 (17.1)	32 (29.6)	76 (70.4)	
Urban	522 (82.9)	204 (39.1)	318 (60.9)	
Single parent household				0.641
Yes	88 (14.0)	31 (35.2)	57 (64.8)	
No	542 (86.0)	205 (37.8)	337 (62.2)	
Household size				< 0.001*
1-2 (small)	134 (21.3)	28 (21.1)	105 (78.9)	
3-6 (medium)	371 (58.9)	183 (42.1)	252 (57.9)	
> 6 (large)	125 (19.8)	25 (40.3)	37 (59.7)	
Head of household gender				0.164
Male	549 (87.1)	200 (36.4)	349 (63.6)	
Female	81 (12.9)	36 (44.4)	45 (55.6)	
Type of cancer				0.389
Head and neck	59 (9.4)	36 (61.0)	23 (39.0)	
Breasts	247 (39.2)	153 (61.9)	94 (38.1)	
Lungs	49 (7.8)	24 (49.0)	25 (51.0)	
Gastrointestinal	120 (19.0)	79 (65.8)	41 (34.2)	
Genitourinary	92 (14.6)	61 (66.3)	31 (33.7)	
Others	63 (10.0)	41 (65.1)	22 (34.9)	
Cancer duration				0.096
< 1 year	323 (51.3)	194 (60.1)	129 (39.9)	
1 to 2 years	123 (19.5)	73 (59.3)	50 (40.7)	
> 2 years	184 (29.2)	127 (69.0)	57 (31.0)	
Cancer staging				0.063
Stage I	67 (10.6)	35 (52.2)	32 (47.8)	
Stage II	145 (23.0)	87 (60.0)	58 (40.0)	
Stage III	218 (34.6)	150 (68.8)	68 (31.2)	
Stage IV	200 (31.7)	122 (61.0)	78 (39.0)	

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Table III: Effectiveness of intervention on knowledge towards WSC, after adjusting for other factors

	Descriptive Analysis n (%)	Bivariate Analysis Health insurance		p value
		Yes n (%)	No n (%)	
Current cancer treatment				0.022*
Follow-up/Symptomatic	186 (29.5)	111 (59.7)	75 (40.3)	
Chemotherapy	281 (44.6)	176 (62.6)	105 (37.4)	
Radiotherapy	127 (20.2)	76 (59.8)	51 (40.2)	
Chemo-radiotherapy	36 (5.7)	31 (86.1)	5 (13.9)	
Treatment location				< 0.001*
Inpatient	172 (27.3)	132 (76.7)	40 (23.3)	
Outpatient	458 (72.7)	262 (57.2)	196 (42.8)	
Surgery				0.099
Yes	291 (46.2)	172 (59.1)	119 (40.9)	
No	339 (53.8)	222 (65.5)	117 (34.5)	
Prior treatment in private healthcare facilities				< 0.001*
Yes	76 (12.1)	20 (26.3)	56 (73.7)	
No	554 (87.9)	374 (67.5)	180 (32.5)	
Other chronic diseases				0.434
Yes	333 (52.9)	213 (64.0)	120 (36.0)	
No	297 (47.1)	181 (60.9)	116 (39.1)	
Disability				0.373
Yes	39 (6.2)	27 (69.2)	12 (30.8)	
No	591 (93.8)	367 (62.1)	224 (37.9)	
Treatment frequency (per year)				0.234
1–3 times (not frequent)	61 (9.7)	44 (72.1)	17 (27.9)	
4–11 times (frequent)	327 (51.9)	204 (62.4)	123 (37.6)	
≥ 12 times (very frequent)	242 (38.4)	146 (60.3)	96 (39.7)	
Guarantee Letter (GL)				0.398
Yes	251 (39.8)	162 (64.5)	89 (35.5)	
No	379 (60.2)	232 (61.2)	147 (38.8)	
Health financial aides				0.310
Yes	43 (6.8)	30 (69.8)	13 (30.2)	
No	587 (93.2)	364 (62.0)	223 (38.0)	
Financial coping mechanism				< 0.001*
Yes	368 (58.4)	269 (73.1)	99 (26.9)	
No	262 (41.6)	125 (47.7)	137 (52.3)	

*Significant results.

4.81 (95% CI 2.57–9.00) and without financial coping mechanism aOR 2.53 (95% CI 1.72–3.73). The final model for logistic regression had a good fit with Omnibus test result of $p < 0.001$, Hosmer & Lemeshow test result of $p = 0.140$ and the Nagelkerke R² value was 0.50.

DISCUSSION

Our study found 31.7% of the respondents have PHI coverage, which was higher than the national data of 22% in the 2019 National Health Morbidity Survey (NHMS).⁸ This is probably due to the higher need for PHI in cancer patients to supplement the payment for their more costly cancer treatment, as not all cancer treatments in public hospitals are fully subsidised by the government. Although Malaysia introduced measures such as personal income tax relief and stand-alone sale of insurance products policy since 1996, uninsured rate continues to be high. The 2019 NHMS also reported that 50.1% of the Malaysian population did not have any form of financial protection for healthcare, apart from the subsidised treatment by the government; and 36% of the surveyed population stated that health insurance was not a necessity while 43% stated that they could not afford to buy healthcare insurance.⁸

Low health insurance coverage of cancer patients can lead to upsurge in self-medication, delay in seeking treatment as well as increase in cases of not seeking treatment despite reporting being sick. Health insurance coverage disruptions are common and adversely associated with receipt of cancer care and survival. Lack of health insurance coverage is one of the strongest predictors of poor cancer outcomes in the USA.¹⁸ The uninsured are less likely to receive evidence-based care throughout the cancer control continuum, including prevention and screening, diagnosis, treatment (ie, surgery, radiation therapy and systemic therapies) and symptom management, survivorship and end-of-life care than their counterparts with health insurance coverage. The uninsured are also more likely to have later stage of disease at diagnosis and poorer survival.¹⁹

As mentioned earlier, PHI policies in Malaysia can be attained on voluntary basis either by individual purchase or through employer-sponsored scheme. The percentage of ownership in the individual purchase health insurance is slightly higher compared to the employer-sponsored insurance. This is also reflected in 2015, where 23.7% had individual purchase and 15% was covered by employer-based health insurance.²⁰ In the Nordic countries, the market is

Table IV: Logistic regression of the study population (n = 630)

	Simple Logistic Regression			Multiple Logistic Regression		
	cOR	95% CI	p	aOR	95% CI	p
Age						
18–40	3.06	1.84-5.07	< 0.001	3.01	1.67-5.41	< 0.001*
41–60	2.27	1.54-3.35	< 0.001	2.22	1.41-3.49	0.001*
>60			Reference			
Household income						
B40			Reference			
M40	3.50	2.43-5.04	< 0.001	2.90	1.92-4.39	< 0.001*
T20	6.00	2.93-12.31	< 0.001	3.86	1.68-8.91	0.002*
Home distance from hospital						
Within KV (near)	1.74	1.24-2.46	0.002	1.68	1.10-2.55	0.016*
Outside KV (far)			Reference			
Household size						
1–2 (small)			Reference			
3-6 (medium)	2.72	1.72-4.31	< 0.001	2.20	1.30-3.72	0.003*
> 6 (large)	2.53	1.31-4.89	< 0.001	1.92	0.89-4.14	0.096
Head of household gender						
Male			Reference			
Female	1.40	0.87-2.24	0.165	1.79	1.01-3.16	0.045*
Current cancer treatment						
Follow-up/ Symptomatic	4.19	1.56-11.26	0.005	5.56	1.73-17.89	0.004*
Chemotherapy	3.70	1.40-9.81	0.009	4.40	1.40-13.82	0.011*
Radiotherapy	4.16	1.52-11.41	0.006	6.82	2.07-22.47	0.002*
Chemo-radiotherapy			Reference			
Treatment location						
Inpatient			Reference			
Outpatient	2.47	1.66-3.68	< 0.001	1.97	1.21-3.19	0.006*
Prior treatment in private healthcare facilities						
Yes	5.82	3.39-9.99	< 0.001	4.81	2.57-9.00	< 0.001*
No			Reference			
Financial coping mechanism						
Yes			Reference			
No	2.98	2.13-4.16	< 0.001	2.53	1.72-3.73	< 0.001*

*Significant results.

cOR = crude odds ratio.

aOR = adjusted odds ratio.

dominated by insurance through an employer: in Norway collective/group policies constitute around 90%, in Sweden 72% of insurance policies were paid by the employer, and in Denmark 75% was part of an employment contract. However, in Finland, only 16% of the insured adults had employer-purchased insurance and as many as 75% had self-purchased insurance.²¹

The average monthly premium amount paid in this study was RM263.28 which is comparable with another study in Malaysia on 1000 respondents aged 20–60 whereby the findings showed majority of the respondents paid RM200 for their monthly PHI premium.²² This amount is fairly affordable considering the adverse selection practice which is common in PHI whereby cheaper plans are designed for young and healthy individuals, and more expensive plans for sick and high risks patients which sometimes can be up to the point of not being affordable. Since public health insurance is not yet implemented in Malaysia, we cannot compare the public and PHI premium in this country; however, this amount was much higher compared to the monthly public health insurance premium of IDR 25,500 to IDR80,000 (RM7.72 to RM24.24) in Indonesia.²³

Majority of the respondents with PHI was covered for both inpatient and outpatient treatments, which is different from

findings from other studies which reported PHI mostly covers hospital inpatient treatments.^{24,25} Majority of the respondents with insurance also was covered for certain health services only and not for all types of health services, including surgery. This is in line with why there were respondents with health insurance who were treated in public hospitals and not in private hospitals. As we know, the treatment of cancer may include surgery apart from chemotherapy, radiotherapy or combination treatments. The cost for surgery in the public hospitals is generally much lower than in the private hospitals, thus patients with health insurance which does not cover surgery will tend to have the surgery in public hospitals.

These patients tend to continue their cancer treatments in the public hospitals also due to the convenience for treatment continuation. Besides, the usual waiting time for cancer treatment in public hospitals is within the acceptable one to two months period. However, for cancer patients who have insurance coverage for all types of health services (including surgery) and have their initial surgery and treatment in private hospitals, they might come to public hospitals later to continue their cancer treatments because their insurance benefits might be limited, and they have exhausted their insurance benefits in the private hospitals prior to coming to the public hospitals.

At the moment, Malaysia still does not have a national social health insurance. The type of health insurance available in the country is mainly the PHI. Fuelled by rising incomes as well as increasing urbanisation, healthcare demand and utilisation, the robust private sector in health is not supported by a well-placed health financing system, which consequently led to the ballooning of out-of-pocket (OOP) payments to finance the use of private medical care and an increasing resort to PHI.²⁶ The Malaysian government has been seeking an alternative scheme to finance health services in a long-drawn out process lasting more than 30 years. In 2002, the government announced the establishment of a health insurance scheme called the National Health Financing Fund to coordinate and provide a more systematic, accessible and equitable health financing system for the Malaysian public. However, the implementation of this scheme was not started due to various limitations and challenges. Thus private funding for health services is still necessary, even in the public hospitals, and that larger companies would be expected to provide health insurance for their employees.²⁷

In countries with large publicly funded health systems, PHI fortifies the system by serving a secondary role of supplementing, complementing or duplicating public health services. Through these roles, PHI also allows greater access to private health care that offers preferential choice for timely care, provider, care options and waiting time, which may contribute towards health and well-being. Overall, the role of private insurance varies depending on the economic, social and institutional settings in a country or region. PHI schemes can be valuable tools to complement existing health-financing options only if they are carefully managed and adapted to local needs and preferences.

Although the health insurance is mandatory in many developed countries, the developing countries is yet to impose regulations on the purchase of health insurance. The PHI sector in Malaysia is relatively new but is growing. The main source of health financing in Malaysian public sector is the national taxation, while in the private sector, the main source is OOP.²⁸ From nearly 60% of Malaysians who seek private primary care, only 18.8% of adult Malaysians are protected with insurance, while the other 73.2% use out-of-pocket (OOP).²⁹ In Malaysia, there are many PHI providers from local and multinational sectors, but they are not able to capture the full market. The success of this industry and its players depends on the awareness levels of consumers.

The socio-demographic and socio-economic factors can influence a household's decision to purchase a PHI policy. In our study, we found that health insurance usage was significantly higher in male respondents. This is in line with studies that reported males are more prone to have health insurance compared to females.^{30,31} This is probably due to the greater involvement of men in the paid labour force and their higher earnings. However, this finding is different from other studies, which show females have more propensities to enroll and renew their health insurance policy compared with males.^{32,33} The increased participation of females in the NHIS policy is mostly linked to their motherly role and vulnerability to healthcare.

Among the major ethnic groups in Malaysia, Malay, other Bumiputera and other ethnic groups had higher likelihood of being uninsured, compared with the Chinese and Indians. Abu Bakar et al. (2012) found that race-religion influences individual health insurance demand in Malaysia.³⁴ Fadlallah et. al (2018) also reported minority ethnicity has positive influence towards the uptake of health insurance in Malaysia.³² Balqis-Ali et al. (2021) stated the likelihood of being uninsured was higher among Malay/other Bumiputera ethnicities.²⁵ Joshi and Lim (2010) reported that the Chinese ethnicity was more likely to possess health insurance compared to the other ethnicities.³⁵ A possible explanation was the income gap between ethnicities in Malaysia. In 2020, the Chinese recorded a median income of RM7391 while the Indians and Malays/Bumiputeras recorded median incomes of RM5981 and RM5420, respectively.³⁶

In our study, those aged 18 to 40 were three times, and those aged 41 to 60 were two times more likely to have health insurance, a finding observed in studies that reported the likelihood of being insured increases with younger age.^{29,31,37,38} Kefeli and Jones (2012) also stated that both males and females in the age range from 21 to 46 are the most prevalent group to have health insurance.¹² Lower insurance coverage among older age group may be related to the relative young market of PHI in Malaysia, higher premium and risk stratification for older individuals. This inadvertently leaves the older with less choices, limiting them to public health care if they are unable to afford private services. This is different from studies that showed older age positively influences the health insurance purchase.³⁹⁻⁴¹

Our study concluded that income was an important predictor of health insurance ownership. The middle-income (M40) group and the high-income (T20) group were found to be three times and six times more likely to have health insurance compared to the lower income (B40) group. In previous studies, the ability of households to enroll and renew their health insurance policy has been linked with the higher income groups compared with those in poor socio-economic standings.^{12,40-44} The poor were found to be less likely to purchase a health insurance because they might not be able to pay the required premiums of the health insurance. The insurance premiums can vary greatly depending on the patient's age and disease including the extent and duration of the insurance coverage. With higher PHI premiums, 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 non-mandatory item such as a PHI is perceived as a greater monetary loss than the benefit it may offer.⁴⁵

Across different settings, the increase in the education level of households increases the odds of owning a health insurance policy. Our study concluded that there is a significant association between having a health insurance and tertiary education. It has been reported previously that individuals educated at higher level, preferably tertiary, have higher odds of purchasing a health insurance policy.^{33,41,46,47} Level of education is directly related to the capacity to accumulate and understand health-related information in making decision to purchase health insurance. 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. Lower education is also directly related to income, affecting the ability to purchase insurance.

Status of employment is an important determinant in the purchase of health insurance. As expected, the employed respondents have a higher probability of purchasing PHI, whereas the unemployed and retired respondents were less likely to buy PHI. Type of occupations was another major demand influencing factor, whereby households engaged in formal occupations that had a constant flow of income were more likely to have health insurance. Previous studies found that ownership of health insurance covers was positively correlated with employment, particularly by formal employment.^{32,40,41,48}

Our study recorded higher health insurance usage in private sector employment, which corresponds with Kefeli and Jones (2012) study which shows taking up of PHI is higher among private sector workers.¹² This may be attributed to the comparatively higher socio-economic status and the fixed salary of private sector workers which encourage those households to buy health insurance, whereas the public sector workers don't really need a PHI as they can rely on their government Guarantee Letter (GL) health benefits.

Distance between households and the health centre played a significant role in the decision to enroll in PHI in previous studies. Our study found that respondents who live near the public hospitals have higher insurance uptake and two times likelihood to have health insurance compared to respondents who live far from the hospitals. This can be explained by the aggregation of many public and private hospitals along with many health insurance provider companies in Klang Valley, whereby the patients have easier access to purchase health insurance if they stay within Klang Valley. This finding is supported by Muhlis (2022) study which shows low enrolment in health insurance is associated with insufficient healthcare accessibility and services availability,⁴⁹ and Sanhueza and Ruiz-Tagle³⁰ study which concluded that the probability of an individual and his dependents having a private health plan increases with nearby private providers.

Household size and composition of the household can affect insurance status. In our study, medium household size and female head of households were more likely to be insured. The responsible person to head a family influences their ability to own a health insurance policy. Thus incidentally, households headed by a female were shown to have increased odds of having health insurance. The employment and socio-economic status of these household heads influences their economic ability to purchase a health insurance policy.

The household size has been demonstrated as one of the predictors of health insurance ownership whereby medium household size has been shown to increase the likelihood of having health insurance by about three times more than the small household size. This is supported by Oriakhi and Onemolease³⁰ study, which reported higher insurance uptake with larger households. This may be as a result of the high financial burden faced by larger households when seeking

health care services for individual household members, thus the reason they need to have a health insurance that can cater for the whole household. However, this finding was not consistent with other studies which reported higher insurance uptake in small households.^{37,44,51}

The findings from this study identify particular groups of people who were more inclined towards joining a health insurance scheme. Other significant results in the bivariate analysis include receiving combination chemo-radiotherapy treatment, inpatient treatment location, without prior treatment in private healthcare facilities and with financial coping mechanism. These findings however were not reflected in the predictive factor analysis, whereby the logistic regression results were significant for other factors, for example follow-up/symptomatic treatment with five times the odds, chemotherapy treatment with four times the odds, radiotherapy treatment with six times the odds, outpatient treatment location has almost two times the odds, prior treatment in private healthcare facilities has four times the odds and without financial coping mechanism also has two times the odds of having health insurance compared to each reference factors. Further studies need to be carried out among the cancer patients to understand these factors and other factors that attract people to purchase health insurance. At the same time, the behaviour of those who did not join also needs to be studied carefully to identify factors that may deter potential clients from joining any insurance schemes.

LIMITATION OF THE STUDY

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, risk attitude of members, trust on provider organisation and availability of alternate insurance or other health service options and exemption from payment within universal health coverage. Moreover, this study did not explore the effect of PHI on health care utilisation and impact towards the Malaysian health system landscape, perhaps areas for future study.

CONCLUSION

PHI has been identified as an intermediate step before initiating a social health insurance scheme that will allow the country to build its capacity to manage publicly funded large scale health insurance schemes. However, it is not a silver bullet in increasing efficiency of health financing mechanisms and ensuring access to quality healthcare for all in a middle-income country like Malaysia. The findings of this study in terms of identifying several factors which can influence PHI usage in public hospital settings are expected to have significant implications in terms of designing demand-driven and context-adapted schemes that have greater potential to attract a larger client pool, ensure effective risk pooling and eventually expedite the achievement of universal health coverage, especially for high costing disease like cancer.

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