# Empowering Older Women in Malaysia: Understanding Their Health Care Demand

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## ABSTRACT

*Understanding factors that affect health care demand by elderly women is vital for a health system to be more supportive towards women's empowerment. This paper presents the medical care utilization of the elderly women; identify the existence of income-related inequity in health care utilization and the role of living arrangements of the elderly on health care utilization among the elderly women in Kedah State. A total number of 202 of respondents aged 62 to 95 were interviewed face-to-face using a structured questionnaire. The Probit and Poisson model were used in estimating the demand equation. It is found that income, after controlling for other socioeconomic and health related factors, is not statistically significant in affecting the likelihood of doctor visits, and the frequency of the visits. The role of living arrangement, as measured by marital status and the number of individual aged 18 and over living together is also not significant in both models. This result suggests that older women in the area of study can somehow make independent decisions regarding their health care demand, which demand should ideally base on health status rather than not other factors.*

***Keywords**: empowerment, health care, elderly women*

## INTRODUCTION

Empowering women is an important agenda for the development of a society that is increasingly challenging. Women are a crucial component

to the development of the country at present due to their contribution in various sectors and the dependence on men is decreasing as many women today have strong economic resources. Inevitably, many studies have discussed the importance of empowerment to economic and social development (Duflo, 2012; Heckert & Fabic, 2013). But what happen to the empowerment of older people? Research suggests that family members have disempowered them by making decision on their behalf as they get older (Beales, 2012).

In this paper, we concentrate on empowerment issues of elderly women. As people live longer, this issue requires continuous study even though this group is economic inactive, but still pursuing social life. Evidence from previous studies that include gender in their estimation show that female demand more health care services than men due to childbearing, and certain diseases are more common in women than in men (Sarma & Simpson, 2006; Windmeijer & Santos-Silva, 1997). The objective of this paper is to identify the existence of inequality in health care demand among the elderly women in the state of Kedah, Malaysia. The idea is to determine whether income and living arrangement, controlling for health status and other variables, are significant in determining doctor visits. Insignificant relationship of income and living arrangement may suggest some level of empowerment in the health-seeking behaviour among the elderly women. The decision made to utilize health services is therefore presume to be highly correlated with health status, independence on financial condition, marital status or influenced by other family members.

## REVIEW OF LITERATURE

Health care consists of various goods and services that maintain and promote physical, mental and social well-being of individuals. Health care is an input in the production of health and as such the consumption or utilization of health care will therefore depend on several factors. Among the factors are age, gender, education, lifestyle, health status and supply factors. In the past few decades, the share of the elderly in the total population has been increasing in both the developed and developing countries. The elderly are said to be the heavy users of health services because they are more prone to health problems – non communicable and chronic health diseases. Based on the behavioural

model of health services utilization, factors that influence the demand or utilization of health care can be divided into three main groups, which are predisposing, enabling and need factors (Aday & Andersen, 1974; Andersen & Newman, 1973).

Predisposing factors are factor that exist before the onset of the illness (i.e. age, education, gender). Age is considered as the important factors influencing demand for health care. When people grow older, they will be more vulnerable to ill-health and chronic diseases (Grossman, 1972). A positive relationship between age and health care demand has been confirmed in some studies, for example studies by Laroche (2000), Pohlmeier & Ulrich (1995), Wolinsky et al. (1983), Evashwick et al. (1984), Deb & Trivedi (1997) and Windmeijer & Santos-Silva (1997). Some studies show a significant relationship between education attainment and the demand for health care (Guralnik et al., 1993; Deb & Trivedi, 1997).

Enabling factorsare factors that make utilization possible. Among factors which are in this category are health care supply, income and insurance status. Some researchers point out the importance of the distance to a health care provider. Time costs include the cost of travel to and from a health provider, waiting time and the delays in getting an appointment. A study in Eastern Africa, Bryant (1972) reports a close correlation between the proximity of health facilities and their use. The negative impact of distance on health care demand has also been highlighted by Novartis Foundation (2003) in a study conducted in the Ségou region of Mali and by Sarma (2009). Being relatively far away from health centers is a constraint to seeking modern health care (Acton, 1975 and Dor et al, 1988).

Higher income increase individuals' purchasing power, and should allow them to demand and utilize health services, and thus enjoy good health (Alderman & Gertler, 1989). Lim et al. (2005) reveal a link between income and health care utilization. High-income individuals were more likely to seek medical attention from several practitioners than people earning less than $30 000 per annum. On the other hand, some researchers came to a conclusion that high income reduces the utilization for health care. In Italy, Atella et al. (2004) suggest that high income people are less likely to visit general practitioner (GP) as this group prefer private specialist than GP. Another enabling factor that has a substantial influence on the demand for health care is insurance coverage. Health insurance determines the level of access, and the availability of health insurance increases

the demand for health care (Deb & Trivedi, 1997; Sarma & Simpson, 2006 and Wan & Odell, 1981).

The last factor according to Aday and Andersen framework is the need factor which is commonly measured by the level of health status. Measures that were used by most researchers in their study are self-perceived health, number of chronic diseases, and disability status. Pohlmeier & Ulrich (1995) finds a significant positive relationship between health status and demand for health care when their results show that individuals' with chronic disease visits to GP is 72 per cent higher than those with no chronic complaints. Evidence obtained by Santos-Silva & Windmeijer (2001), and Dev & Trivedi (1997) are also consistent with that of Pohlmeier & Ulrich (1995). Results obtained by Dunlop et al. (2000) and Sarma et al. (2006) also indicate that self-perceived health status and number of health problems were the variables most strongly associated with both visits to GPs and specialists.

The review on health care demand reveals the set of variables used in health care demand model. These variables are considered for empirical analysis in the next section.

## METHOD AND DATA

The survey was conducted in October 2012. A total of 400 respondents aged 60 and over, were interviewed face-to-face using a structured questionnaire and only 202 respondents are women. The multistage cluster sampling was used in selecting the sample for the study. All districts in Kedah were first divided into three strata, based on the status of the municipal council of the district which are City, Municipal and District Councils. Next, at least one district was randomly selected from each stratum. The number of respondents chosen was proportionate to the number of total population in each stratum. Later, for all districts chosen, the *mukim* (sub-districts) were listed down and arranged in ascending order based on the number of population. We later picked the sub-district at the top, median and bottom of the list. The next stage was to select the targeted area. By selected *mukim*, all housing estates and *kampung* (villages) have been listed out. The list was furnished by the Municipal Council of each district. At this stage, the quota sampling technique was used based on the number of respondents determined in the previous stage. Each

numerator had randomly picked one living quarter from the listed *kampung* or housing estate to find the first respondents aged 60 and over, followed by the next house and so on until the predetermined sample size was achieved.

***Probit Model***

The probit model is used in determining factors on health care demand, specifically on formal doctor visits by the elderly women. The respondents were asked whether they had visited a doctor in the past one month before the interview which may also include the regular visits. Assume that for each elderly woman, there is a latent variable that represents her unobserved demand on health care. This unobserved demand is associated with variables such as socio-demographic characteristics of the elderly and other considered variables ($x_i$). Let $y^*$represent this latent variable and assume that $y^*$is a linear function of $x_i$, then,

$$y_i^* = \sum_{i=1}^{n} \beta x_i + u_i$$

where
$y^*$= unobserved demand on health care
$x$ = independent variables
$u$ = error term

Let $y$ be the random variable that represents the observed outcomes such that value of $y$ is observed as:

$y$ = 1 if the elderly have had doctor visits in the last one month
= 0 if otherwise

Assume that the error term in the latent equation (1) follows a normal distribution, we have the probit model. The probability that the elderly have observed outcome of demand for health care (y=1) or otherwise (y=0) is given as below:

$$\text{Prob}(y=1) = \text{Prob}(y^* > 1) = \text{Prob}(x'\beta + u > 0) = \text{Prob}(u < x'\beta) = \Phi(x'\beta)$$
$$\text{Prob}(y=0) = 1 - \text{Prob}(y=1) = 1 - \Phi(x'\beta)$$

The Φ is the cumulative standard normal distribution function. The maximum likelihood parameter estimates (MLE) are obtained by maximising the following log likelihood function with respect to β:

$$LF(\beta) = \sum_{i=1}^{n} y_i \ln(\Phi(x'\beta)) + (1 - y_i)\ln(1 - \Phi(x'\beta))$$

The model will be estimated with the robust variance estimator (Huber/White/sandwich estimator of variance).

***Count Model***

Count model is used to model the number of visit to health care which in this study would be the number of doctor visit. The initial empirical model for health care demand $Y$, is specified as below:

$$\mathrm{E}\left(Y = y_i \middle| x_i\right) = \exp\left(x_i'\beta\right), \qquad i = 1...N$$

Where $y_i$ is the realised demand for health care for individual *i* and $x_i$ is a vector of characteristics of individual *i*, assumed to be exogenous, that determine $y_i$. Since the dependent variable is restricted to non-negative integer values, count data models are required. Poisson model is a basic model for count data which assumes that the conditional mean and variance are equal.

Suppose the number of occurrences for $y_i$, given $x_i$, is Poisson distributed with density:

$$f\left(y_i \middle| x_i\right) = \frac{e^{-\lambda_i}\lambda_i^{\,y_i}}{y_i!}, \qquad y_i = 0, 1, 2...$$

with the consequence that

$$\mathrm{E}\left(y_i \middle| x_i\right) = \lambda_i = \exp\left(x_i'\beta\right) = \mathrm{V}\left(y_i \middle| x_i\right)$$

This shows the equality of the conditional mean and conditional variance (equidispersion).

## ANALYSIS AND DISCUSSION

### *Descriptive Analysis*

This section highlights the characteristics of the respondents of the study. Overall respondents are Malays (75%) with average age of 71 years old and have low level of education attainment. List of variables with the summary statistics of independent variables used for empirical analysis is presented in Table 1.

In terms of their utilization of health care, most respondents utilized the doctor visit (53.96%) followed by getting the medicine over the counter. This is notable as over the counter utilization is simple and easy. As illustrated in Figure1, being an inpatient is found to be the least used of health care.

### *Probit Model*

The probit model is estimated for the demand of health care. The estimated probit model is fit to the data significant with p-value of almost zero and pseudo R square of 0.39. In terms of multicollinearity among independent variables, the values of Variance Inflation Factors (VIF) are found to be ranged from 1.12 to 2.4, which is below the value of 10. Hence, the estimated probit model does not suffer serious multicollinearity problem. This section reports the influence of the three types of factors on the probability of doctor visits.

The estimation from the probit model is shown in Table 2. The analysis shows that the predisposing factor has no influence the demand for health care. In terms of enabling factors, social interaction and district are statistically significant in determining the likelihood of doctor visit. It suggests that the higher the chat with friend &neighbour, the less likely the visit to the doctor. The inclusion of district variable is to pick up the effect of health care supply. The negative effect may represent the phenomenon of 'supply induced demand'. From the regression, however, we found that that those in lower supply district are more likely to utilized doctor services. This finding implies that, in this case, district may present socioeconomic status, rather than supply variable. Those who live in Kuala Muda (KM) and Kubang Pasu-Bandar Baharu (KPBB) are less likely to visit a doctor than those of Kota Setar. This result implies that, besides health status, factors under predisposing and enabling groups may have also influenced demand.

**Table 1**

*Independent Variables for Health Care Model*

| Variables | Definition | Mean (Std. Dev) | Min | Max |
|---|---|---|---|---|
| ***I. Pre-disposing factors:*** | | | | |
| **AGE** | Age in year | 70.737 (7.57) | 62 | 95 |
| **MALAY** | 1 if Malay, 0 otherwise | 0.747 (0.43) | 0 | 1 |
| **EDU** | Highest Education level (1 if has no formal schoolto 6 if post degree) | 1.831(1.16) | 1 | 6 |
| **NO_WORK** | 1 if economic inactive, 0 otherwise | 0.915 (0.28) | 0 | 1 |
| **SMOKER** | 1 if a smoker, 0 otherwise | 0.035 (0.18) | 0 | 1 |
| **VEGE** | 1 if full vegetarian, 0 otherwise | 0.034 (0.18) | 0 | 1 |
| **EXCERSICE** | Time allocation for exercising in a week (1 if does not exercise at all to 5 if exercises more than 3 hours) | 1.846 (1.18) | 1 | 5 |

(continued)

| Variables | Definition | Mean (Std. Dev) | Min | Max |
|---|---|---|---|---|
| *II. Enabling factors:* | | | | |
| **INCOME** | Total of individual income from all sources | 282.282(343.02) | 0 | 1700 |
| **INSURANS** | 1 if have medical insurance, 0 otherwise | 0.034 (0.18) | 0 | 1 |
| **MARITAL STATUS** | 1 if married, 0 otherwise | 0.51 (0.5) | 0 | 1 |
| **LIVE** | Number of individuals aged 18 and above that are currently living together | 1.698 (1.46) | 0 | 7 |
| **CHAT** | 1 if had informal interaction with the society (e.g. chatting at coffee shop or at home), 0 otherwise | 0.515 (0.5) | 0 | 1 |
| **TRUST** | 1 if living community can be trusted, 0 otherwise | 0.945 (0.23) | 0 | 1 |
| **DISTRICT** | District (Kota Setar (reference variable)KM - 1 if live is Kuala Muda, 0 otherwise | 0.40 (0.49) | 0 | 1 |
| | KPBB - 1 if lives in Kubang Pasu and Bandar Baharu, 0 otherwise | 0.371 (0.48) | 0 | 1 |

(continued)

| Variables | Definition | Mean (Std. Dev) | Min | Max |
|---|---|---|---|---|
| **OTC** | 1 if had utilized over the counter market for health care (e.g. pharmacy, *sinseh*, etc), 0 otherwise | 0.5 (0.50) | 0 | 1 |
| **ALT** | 1 if had utilized alternative health services or traditional healers, 0 otherwise | 0.10 4(0.31) | 0 | 1 |
| ***III. Needs factors:*** | | | | |
| **SAH** | Self-assessed health<br>1 - Good, 2 - Average, 3 – Poor | 1.87 (0.65) | 1 | 3 |
| **LONG_ILL** | 1 if have longstanding health problems, 0 otherwise | 0.693 (0.46) | 0 | 1 |
| **BP** | 1 if reported of having high blood pressure, 0 otherwise | 0.415 (0.49) | 0 | 1 |
| **DIABETES** | 1 if reported of having diabetes, 0 otherwise | 0.207 (0.41) | 0 | 1 |
| **ARMS** | 1 if reported of having problems with arms, legs, hands, feet, back, neck, 0 otherwise | 0.386 (0.48) | 0 | 1 |

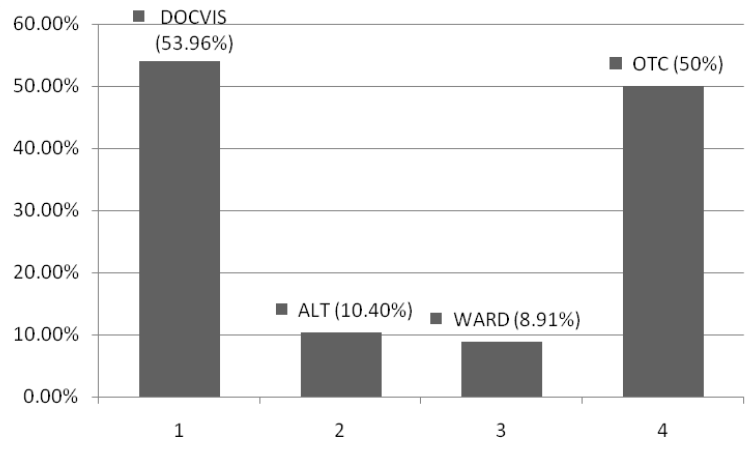


**Figure 1.** *Distribution of Health Care Utilization*

All need factors, except ARMS are statistically significant in determining doctor visits. This result shows how strong the influence of health status in health care demand model. The self-assessed health (SAH), the existence of longstanding illness and the three most prevalence health problems among the respondents are used in the regression and they show the right sign as expected.

**Table 2**

*The Estimated Probit Model on Doctor Visits (DOCTOR)N=202*

| Variables | Coefficient | p-value |
|---|---|---|
| ***Predisposing factors:*** | | |
| AGE | -0.023 | 0.218 |
| ETHNIC | 0.009 | 0.973 |
| EDU | -0.176 | 0.115 |
| RETIRED | -0.397 | 0.423 |
| SMOKER | 0.151 | 0.775 |

(continued)

| Variables | Coefficient | p-value |
|---|---|---|
| VEGE | 0.622 | 0.259 |
| EXERCISE | 0.089 | 0.421 |
| ***Enabling factors:*** | | |
| INCOME | 0.00003 | 0.943 |
| INSURANCE | -0.142 | 0.862 |
| MARRIED | 0.028 | 0.915 |
| LIVE | 0.026 | 0.712 |
| CHAT | -0.634 | 0.005** |
| TRUST | 0.387 | 0.466 |
| KM | 0.4890 | 0.115 |
| KPBB | 1.008 | 0*** |
| OTC | 0.023 | 0.93 |
| ALT | 0.162 | 0.681 |
| ***Need factors:*** | | |
| SAH | 0.807 | 0*** |
| LONG_ILL | 0.709 | 0.053* |
| BP | 0.670 | 0.026** |
| DIABETES | 0.706 | 0.036** |
| ARMS | 0.231 | 0.437 |
| **Constant** | -0.915 | 0.538 |
| **LogL** | -84.73 | |

The symbol ***, ** and * denote 1%, 5% , 10% level of significance, respectively

### *Poisson Model*

Poisson model is used to determine factors that affect the frequency of use. It is found that the level of exercise, which is the proxy of health seeking behaviour, is positively determined the number of visits. As we expected, those who exercise, thus have a positive attitude towards health, utilized health care more than those who do not exercise, *ceteris paribus.* The accumulation of social capital through the engagement in informal interaction in the community proves to be vital in determining demand.

As in probit model, district shows a similar pattern. Those in KM and KPBB utilized more doctor services than those in KS, but the effect is only significant for KPBB. The frequency of visit is strongly determined by SAH and the prevalence of longstanding illness with 1% significant level.

**Table 3**

*The Estimated Poisson Model on the Frequency of Doctor Visits (N_DOC)*

| Variables | Coefficient | p-value |
|---|---|---|
| ***Predisposing factors:*** | | |
| AGE | -0.002 | 0.849 |
| ETHNIC | 0.091 | 0.544 |
| EDU | -0.106 | 0.109 |
| RETIRED | -0.176 | 0.461 |
| SMOKER | -0.054 | 0.872 |
| VEGE | 0.163 | 0.568 |
| EXERCISE | 0.115 | 0.063* |
| ***Enabling factors:*** | | |
| INCOME | 0.00001 | 0.659 |
| INSURANCE | -0.095 | 0.786 |
| MARRIED | 0.008 | 0.947 |
| LIVE | 0.058 | 0.248 |
| CHAT | -0.453 | 0.003** |
| TRUST | -0.202 | 0.446 |
| KM | 0.341 | 0.13 |
| KPBB | 0.623 | 0.004** |
| OTC | 0.112 | 0.432 |
| ALT | 0.0250 | 0.883 |
| ***Need factors:*** | | |
| SAH | 0.374 | 0.003** |
| LONG_ILL | 1.133 | 0* |

(continued)

| Variables | Coefficient | p-value |
|---|---|---|
| BP | 0.192 | 0.182 |
| DIABETES | 0.158 | 0.287 |
| ARMS | -0.096 | 0.505 |
| **CONSTANT** | -2.251 | 0.01 |
| **LogL** | -165.255 | |

The symbol ***, ** and * denote 1%, 5% , 10% level of significance, respectively

## CONLUSION

Empowering older women is essential in achieving social well-being. This paper investigates the level of empowerment among the elderly women in Kedah, Malaysia by understanding the determinant of their health care demand, specifically doctor visits. Two econometric models are used in identifying the effect of income and living arrangement on health care utilization. From both models it reveals that older women demand for doctor services does depend on income or living arrangement. However, some other factors are significant but not within the scope of this paper. The finding suggests that the elderly women in Kedah are able to make independent decision in utilizing health services based on their health condition, without significance influence of the interest variables.

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