Healthcare Demand and Its Determinants

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ABSTRACT

Background: Healthcare demand is individuals’ decision on the choice of healthcare utilisation. Healthcare demand and its determinants can identify reason for the rise of healthcare expenditure and to essentially identify influential determinants for cost reduction via demand analysis. This manuscript aims to review the demand for healthcare and its determinants.

Materials and Methods: A scoping systematic review was conducted, searched through the domains of PubMed, ScienceDirect, and Google scholar, using keywords of "healthcare demand" AND "medical care" OR determinants AND "medical care" OR demand AND "medical care" OR demand AND "health services" OR determinants AND "medical care" OR factors AND demand AND "medical care". Full articles from 30 year-recent publications, related with demand for healthcare and its determinants as well as written in English are included. Reviewed articles were excluded from the result findings.

Result: Initially, 327 articles were searched from the databases and an additional nine from other sources. Articles that were duplicated were removed. Then, 233 articles underwent primary screening based on titles and abstract. Following this, 75 articles underwent secondary review for eligibility and 20 articles were finally chosen and included as the final literature search. Healthcare demand was pertaining to healthcare utilisation based on types of healthcare providers and types of services provided, health status and also health expenditure. The determinants of healthcare demand were; age, gender, ethnicity, education, occupation, household income and size, marital status, family size, health status, health problems and duration, medical insurance coverage, medical and non-medical costs or price, health expenditure, distance to provider and waiting time.

Conclusion: Healthcare demand’s determinants can assist in resource allocation to be group-specific. Moreover, the nation’s health system is able to provide more effective care to the population. This will subsequently assist policymakers with evidence of demand-side evidences for a more effective pattern of health behaviour.

Keywords: Healthcare demand, determinants of healthcare demand
1.0 Introduction

The World Bank Institute described healthcare demand as individuals’ decision on the choice of healthcare utilisation. There are two approaches of making choices namely; preferences made by individuals whilst having health as a commodity, or healthcare utilisation as investment for health because health is regarded as stock and this subsequently promotes productivity (Jack, 1999). The healthcare demand of individuals can provide the satisfaction (also known as utility) of need or want (perceived), estimated through the concept of health production function (Adhikari, 2011; Scott, 2016). Grossman (1972) firstly described the second approach more than 45 years ago.

1.1 Healthcare Demand

The preference of being healthy compared to being sick is the expression of demand for healthcare. The extent of individuals’ health preference would determine the demand for healthcare. Preferences are independent of the status of health. The demand for healthcare changes during an illness because healthcare improves health. Healthcare is demanded as input into health production. Prices may be high because of two reasons namely, high demand or limited supply. In terms of healthcare, the price of health matters individually, Demand for healthcare is inelastic to price hence healthcare will be purchased at any price to be healthy (ultimately limited by income, but trading off other products).

1.2 Total Health Expenditure and Healthcare Demand

Total health expenditure in the world has been on the rise. The increment on total health expenditure was from 8.50% of GDP in 1995 to 9.90% of GDP in 2015 (World Bank, 2018). In 2015, the Gross Domestic Product (GDP) on health was 7%, 6% and 12% for low-, middle- and high income countries respectively (World Health Organization, 2017). Total health expenditure in Malaysia has rise too from RM8,277 million in 1997 to RM52,609 million in 2015 (Ministry of Health Malaysia, 2017). Consumption intensity of healthcare is portrayed by expenditure on healthcare. Analysing healthcare determinants can identify reason of healthcare expenditure to rise and to essentially identify influential determinants for cost reduction. Quantification of demand’s determinants for healthcare, assessment of community healthcare can be conducted and evaluation of the the impact of healthcare utilisation can be measured (Adhikari, 2011).

1.3 Healthcare Demand, Demand Curve and Elasticity of Demand

Figure 1 shows a demand curve that portrays consumer preferences about product and supply curve that illustrates the quantity that producers willing to supply at certain prices. As price decreases, consumers tend to purchase more quantities as shown in the demand curve. On the other hand, as price increases, produces tend to produce more products. The level of price equilibrium occurs as the process of market participants interact. At this point, consumers’ demanded quantity at specific price is equal to producers’ supply quantity at that price. That specific price is said to be the market price because no other price level matches the consumers’ demanded quantity and producers’ supply quantity. Excess supply occurs if prices are more than this level and excess demand occur as prices fall below this level. Health is a perfect competitive market, therefore reacts to market participants. Consumers, producers and
society as a whole converge in a perfect competitive market. Value of product is reflected by price. It signals supplier the option of changing product amount relative to consumer demand changes. The structure of this market results in economic agents to act in the best interest of society. The demand of consumers are met, the most number of outputs are supplied by producers and society is able to obtain the most outputs from scarce available resources (Mankiw, 1998; Mansfield, 1982; Scott, Solomon, & McGowan, 2001).

![Demand and Supply Curve](image1)

**Figure 1: Demand and Supply Curve**  
Source: Sorkin, 1992

Elasticity of demand is a concept that gives the measurement of responsiveness of a change of percentage in a variable due to a change of percentage in another variable, such as change of demand due to price change (Baye & Prince, 2013). Elasticity is either elastic or inelastic as shown in Figures 2 and 3 respectively.

![Perfectly Elastic Demand](image2)  
**Figure 2 Perfectly Elastic Demand**  
Source: Baye & Prince, 2013  
D = demand

![Perfectly Inelastic Demand](image3)  
**Figure 3 Perfectly Inelastic Demand**  
Source: Baye & Prince, 2013  
D = demand

Demand for healthcare expenditure is inelastic. Therefore, when healthcare price increases, there is also increase of expenditure in healthcare (Nahata, Ostaszewski, & Sahoo, 2005). As for income elasticity, the concept is similar except that change of demand is due to income change. As income increases, demand also increases for normal goods but as income increases, demand decreases for inferior goods (Baye & Prince, 2013).
1.4 Demand, Needs and Wants

Populations’ demand for healthcare is a functional relationship, which is the amount of healthcare that the population wants to purchase with underlying variables of prices, income, health states etc. The concept of population needs for healthcare is concerning the amount that is felt should be consumed based on opinions from medical experts. On the other hand, needs differs from wants. Population wants for healthcare is regarding the quantity that is felt should be consumed based on their own health needs’ perceptions (Schaefer, 1975).

Therefore, if cost (both direct and indirect) is theoretically eliminated, wants will be identical with demand. However, if the condition of population having perfect health information is theoretically removed, needs will still not be similar to wants. This is because, a well-informed patient on his or her health, or a decision on therapy options, may still lead to individuals disagreeing with the option that is chosen by his or her physician (Schaefer, 1975).

1.5 Grossman’s Theory on Demand for Healthcare

In the field of economics, health is regarded as stock and being healthy is the output of concern. Demand for healthcare is towards the commodity of ‘good health’. The demand for healthcare is also in other words, the demand for utility (i.e. healthy days for work or leisure). There are two reasons that individuals demand for healthcare. Firstly, consumption of commodity and secondly is investment of commodity. The benefit of consumption leads to the ‘feeling better in a healthier condition’. Whereby investment of commodity promotes more number of days for participation in household or non-work-activities. Better health leads to productivity. Well-being can be enjoyed resulting in happiness in life. Individuals are not merely consumers that consume health but rather, they are producers who allocate resources such as time and money for health production. Medical care is not the sole variable that contributes to the output. Others include income, education, age, social class, employment status, work environment, housing conditions, lifestyle and diet (Grossman, 1972).

This manuscript aims is to review the demand for healthcare and its determinants. Reviewing various reported examples of healthcare demands and its determinants can assist in identifying reasons for the rise of healthcare expenditure and to essentially identify influential determinants that may reduce cost.

2.0 Materials and Methods

A scoping systematic review had been conducted for obtaining articles in pertaining to the studied topic. The articles were searched through the domains of PubMed, ScienceDirect, and Google scholar, using keywords of "healthcare demand" AND "medical care" OR determinants AND "medical care" OR demand AND "medical care" OR demand AND "health services" OR determinants AND "medical care" OR factors AND demand AND "medical care". The inclusion criteria were all full articles from 30 year-recent publications, related with demand for healthcare and its determinants and written in English. Articles that were not related, including reviewed articles were excluded from the result findings.
PRISMA 2009 flow diagram in figure 4 portrays the flow of literature search. Initially, 327 articles were searched from the databases and an additional nine articles were found from other sources. Articles that were duplicated in the search were removed and subsequently 233 articles underwent primary screening for relevancy based on titles and abstract. Following this, 75 articles underwent secondary review for eligibility (that was mentioned earlier). Lastly, 20 articles that were finally chosen were included as the final literature search.

3.0 Results and Discussion

In this section, the results of review are presented based on the article’s title, author, year, country and population setting or source of data. The findings were tabulated as in Table 1 below discussing according to the dependent variables chosen by the authors to reflect healthcare demand and also the determinants of healthcare demand that are selected.
Table 1: Published Research on Healthcare Demand and its Determinants

<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Author, Year, Country</th>
<th>Population setting / Data Source</th>
<th>Dependent variables</th>
<th>Determinants of demand for healthcare</th>
</tr>
</thead>
</table>
| 1   | The effect of costs on Kenyan households’ demand for medical care: why time and distance matter | Kukla et al., 2017 Kenya | 1000 households from Demographic Surveillance System and administered Healthcare Utilization and Attitude Survey | Medical provider - Public, private, informal, self-care                                                   | Direct medical costs (household OOP for healthcare)  
Direct non-medical costs (household OOP for transportation)  
Indirect medical cost (household time cost for healthcare utilization) |
| 2   | Demand for private healthcare in a universal public healthcare system: empirical evidence from Sri Lanka | Pallegedara & Grimm, 2017 Sri Lanka | 25,000 housing units based on Household Income and Expenditure Survey and Annual Health Statistics | Outpatient/inpatient treatment – public, private, both, none                                             | Socio-demographics of households and individuals (age, gender, ethnicity, education, urban/estate, household size, household monthly expenditure, chronic disease/disability) |
| 3   | New impacts of Grossman’s health investment model and the Russian demand for | Burggraf, Glauben & Grecksch, 2016 Russia | 5,314 households from Russia Longitudinal Monitoring Survey | 1. Constructed demand (No demand, doctor visits, doctor visits with medicine, doctor visit and procedure, hospital | Age, education, price, household income, health status (self-reported), problem in health (past 30 days)  
Control: demographic (gender &household) |
<table>
<thead>
<tr>
<th>No.</th>
<th>Study Title</th>
<th>Authors</th>
<th>Country</th>
<th>Methodological Details</th>
<th>Findings/Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Social capital as correlate, antecedent, and consequence of health service demand in China</td>
<td>Dong, 2016 China</td>
<td>China</td>
<td>China Health and Nutrition Survey (household, longitudinal)</td>
<td>Visited healthcare provider (visited provider or hospitalised within prior 12 months) Age, gender, education, marital status, monthly wage, status of health, hours of working, medical insurance, household children under six, metropolitan/rural, owning business Control: gifts from friends (external social), gifts from family (internal social)</td>
</tr>
<tr>
<td>5</td>
<td>Population ageing and healthcare demand: the case of Slovenia</td>
<td>Vrhovec &amp; Tajnikar, 2016 Slovenia</td>
<td>Slovenia</td>
<td>Slovenian National Institute for Public Health</td>
<td>Effects of ageing: 1) increment in demand (treatment numbers) of primary care, secondary care, hospital day care, hospitalisations; 2) treatment demand structure (disease type) Medical services, age groups, main disease group</td>
</tr>
<tr>
<td>6</td>
<td>Determinant of demand for health care services among rural household in Ekiti State, Nigeria</td>
<td>Sunday, Waheed, Isiaka &amp; Oluremi 2015 Nigeria</td>
<td>Nigeria</td>
<td>122 households randomly selected via multistage random sampling of Ekiti state &amp; administered questionnaires</td>
<td>Source of healthcare use: dispensary/primary health care, private hospital/clinic, general/teaching hospital, traditional/spiritual General living standard – sex, age, marital status, education level, occupation, household size, household expenditure, household distance, waiting time</td>
</tr>
<tr>
<td>7</td>
<td>The demand for health care by the elderly in Kedah: do enabling factors</td>
<td>Samsudin, Abdullah, Applanaiadu, Majid, Eam</td>
<td>Kedah</td>
<td>399 respondents in Kedah state randomly sampled via multistage cluster sampling &amp;</td>
<td>Doctor’s consultation/visit (within prior one month) Predisposing factor: age, gender, ethnicity, education, employment, smoking, vegetarian, exercise. Enabling factor: individual income,</td>
</tr>
</tbody>
</table>
| Matter | Abu Bakar 2013 Malaysia | underwent face-to-face interview | insurance, marital status, living together, social chatting, trusting community, district area, OTC utilisation, alternative utilisation
Need factors: health status (self assessed), chronic health problem, high blood pressure, diabetes, limbs’ problems |
|---|---|---|---|
| 8 | Determinants of demand for health care in Bangladesh: an econometric analysis | Ali & Noman 2013 Bangladesh | 276 randomly sampled participants in Broga district & underwent face-to-face interview
Seeking health care for any disease (within one month prior) | Health care price, drug cost, individual income, age, education level, distance to provider, waiting time, duration of illness, quality of care |
| 9 | Determinants of the demand for using preventive medical care among adults in Penang, Malaysia | Cheah, 2012 Malaysia | 398 conveniently sampled participants from Penang, administered questionnaire
Preventive medical care usage | Age, ethnicity, gender, marital status, medical insurance, area of resident, history of family illness, education level, income, participation of physical activity, health status (self-perceive) |
| 10 | New estimates of elasticity of demand for healthcare in rural China | Zhou, Su, Gao, Xu & Zhanf, 2011 China | 38,955 and 38,970 households from the 2003 and 2008 National Health Services Survey respectively
1) outpatient visits
2) outpatient visits among users
3) inpatient visits | Price: outpatient & inpatient, income |
<table>
<thead>
<tr>
<th>No.</th>
<th>Study Title</th>
<th>Authors</th>
<th>Study Design</th>
<th>Data Collection Methods</th>
<th>Variables Investigated</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Estimating the demand for health services in four poor districts of Cape Town, South Africa</td>
<td>Skordis-Worrall, Hanson &amp; Mills, 2011 South Africa</td>
<td>144 households and 250 individuals sampled from multi-stage cluster from four districts, underwent weekly health diary &amp; also household survey data</td>
<td>Provider services used, number of visits among users (within a week)</td>
<td>Age, gender, ethnicity, insurance, years of education, household income, physical and mental health, accessibility to extra household funding, remittances, savings, perceived household financial situation, price of consultation, expected quality of provider</td>
</tr>
<tr>
<td>12</td>
<td>Illness reporting and demand for medical care in rural Burkino Faso</td>
<td>Pokhrel, Allegri, Gbangou &amp; Sauerborn, 2010 Burkino Faso</td>
<td>990 households from Nouna Health District Household Survey</td>
<td>Episodes of illness, sought treatment, types of providers chosen</td>
<td>Age, gender, education level, ethnicity, occupation, marital status, local resident/not, household expenditure, cost of medical care</td>
</tr>
<tr>
<td>13</td>
<td>Population ageing and its implications on aggregate health care demand: empirical evidence from 22 OECD countries</td>
<td>Palangkaraya &amp; Yong, 2009 Australia, Belgium, Canada, Czech Republic, Denmark, Finland, France, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, Norway, Portugal, Spain, Switzerland, Turkey, United Kingdom and</td>
<td>Six years time series for 22 OECD countries based on OECD Health Data</td>
<td>Health expenditure</td>
<td>Health price index, GDP price deflator, Income (GDP in US$), proportion of more than 65 years old, following year crude death rate, public sector size</td>
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<tr>
<td>No.</td>
<td>Study Title</td>
<td>Country/Region</td>
<td>Sample Details</td>
<td>Variables Studied</td>
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<td>14</td>
<td>Determinants of health care demand in poor, rural China: the case of Gansu Province</td>
<td>China</td>
<td>Qian, Pong, Yin, Nagarajan &amp; Meng, 2009 4376 individuals from household survey</td>
<td>Type of provider: self treatment, public or private village clinics, township health centre, country hospital</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>The determinants of health care demand in Uganda: the case study of Lira district, Northern Uganda</td>
<td>Uganda</td>
<td>Odwee, Okurut &amp; Adebua, 2006 594 households of Lira district sampled via probability proportional to size, administered questionnaires accordingly</td>
<td>Demand for facility (government, private, self-medication)</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>The demand for medical care in urban China</td>
<td>China</td>
<td>Mocan, Tekin &amp; Zax, 2004 6407 urban households from People’s Republic of China’s urban families’ survey</td>
<td>Household medical care spending</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Quality of care and the demand for health services in Bamako, Mali: the specific roles of</td>
<td>Mali</td>
<td>Mariko, 2003 1191 households from household and health facility survey</td>
<td>Illness episodes that patient faces (alternatives): self-treated, informal practitioner (modern),</td>
<td></td>
</tr>
</tbody>
</table>

- Qian, Pong, Yin, Nagarajan & Meng, 2009
- Odwee, Okurut & Adebua, 2006
- Mocan, Tekin & Zax, 2004
- Mariko, 2003
| 19 | The production of health and the demand for health care in Finland | Hakkinen, 1991 Finland | Finnish Survey on Health and Social Security | Health status (self perception, number of chronic diseases, psychosomatic complaints) and utilisation of health service (number of doctors’ visits, number of hospitalisation, value, price and number of prescribed medicine) | Age, gender, education, medical education, occupation, family size, household size, household number of amenities in the house, distance to provider, pregnancy |
| 20 | Health status and the demand for health: results on price elasticities | Wedig, 1988 | 5322 adults from National Medical Care Utilization and Expenditure Survey | Health status and elasticity of demand (physician visits) | Out-of-pocket expenditure, income, wage, education level, age, gender, ethnicity, family size, marital status, settlement area, perceived health and limitation of activity |
3.1 Healthcare Demand’s Variables

A patient goes through a process of two part of decision-making (Pohlmeier & Ulrich, 1995). He makes a decision about the visit to seek medical care. Upon the diagnosis by the doctor on the patient’s illness, the doctor plans the determination of treatment intensity with the patient. This subsequently lead to the expenditure for healthcare (Duan, Manning, Morris, & Newhouse, 1983). Hence, the demand for healthcare maybe represented with the variables such as physician visit, the number of the visits and expenditure of healthcare (Duan et al., 1983; Yu & Kuo, 2016).

In the estimation of demand equations, expenditure for components of healthcare was usually used as dependent variable. Whereby demographic factors were included as independent variables with assumption of preference of care. Healthcare expenditure represented the consumption of healthcare components’ value (Sorkin, 1992).

3.2 Determinants of Healthcare Demand

Age and income as determinants for healthcare demand had been recognized more than 45 years ago and had been justified with theoretical evidence (Grossman, 1972). Other recent studies had also discussed on the importance income with or without age as determinants of healthcare demand (Atella, Brindisi, Deb, & Rosati, 2004; Propper, 2000). Moreover, the concept of depreciation explains about age affecting the demand for healthcare. Stock of health is likely to decrease over time. Advancing age (function of age), supplemented the increment for stock of health’s depreciation (Muurinen, 1982).

There are a variety of income groups from one household to another or from one country to another. It varies in terms of expenditure and the response of demand towards the rise of incomes. The response towards income change is higher among poorer household or poorer countries (Azzam & Rettab, 2015). In a demand analysis of Demographic Surveillance with additional survey in Kenya, households that were poorer response more and were more likely to utilise self-treatment or informal care (Kukla et al., 2017). On another note, in regards to richer households, a demand analysis based on Household Income and Expenditure Survey and Annual Health Statistics in Sri Lanka, discussed the tendency of these group of people to utilise private healthcare in contrary to public healthcare even though there is presence of universal public healthcare (Pallegedara & Grimm, 2017).

Gender was discussed to be associated with demand for healthcare (Sorkin, 1992). Females were expected to consume more than males most likely due to obstetrical needs, with assumption of having similar health status (Kennedy, 1979). In South Africa, the analysis of demand for healthcare revealed 144 households and 250 individuals from four districts to have gender as the predictor of demand (Skordis-Worrall, Hanson, & Mills, 2011).

A local study in Kedah took into consideration the variable of ethnicity as predisposing factor that an individual have in existence prior to acquiring diseases (Samsudin et al., 2013). A study conducted in Burkina Faso using their Health District Household Survey, among others, ethnicity was a significant predictor towards the demand for healthcare (Pokhrel, De Allegri, Gbangou, & Sauerborn, 2010).
Education was related to increment of health productivity because being more educated implied higher skills to combine inputs for health production. Therefore, more educated population would demand bigger stock of health (Grossman, 1972). Furthermore, increment of investment return shall also influence health in the presence of high education (Burggraf, Glauben, & Grecksch, 2016; Leibowitz, 2004). Higher education level was further discussed in the relationship with lower mortality rates (Elo & Preston, 1996; Freedman & Martin, 1999).

The function of education, occupation and also income were described to signify socioeconomic status. It was shown to have impact on demand for healthcare. Positive association was noted more for preventive services (Sorkin, 1992).

Marital status was also discussed to be associated with demand for healthcare. Never married individuals were less likely to attain healthcare whereby among divorcees, consumption of healthcare was found to be highest (Rosko & Broyles, 1988). In China, a demand analysis study revealed that marital status of patients in the rural is a significant factor towards the demand model for healthcare, at 10% significance level (Qian, Pong, Yin, Nagarajan, & Meng, 2009).

A demand analysis article conducted in Kenya revealed that occupation is one of the significant determinants of demand for healthcare, at higher quantiles (Mwabu et al., 2003). However, in another demand analysis study in Finland, occupation is of equal impact as determinants for healthcare demand with education. But, on their own, the separate effects of each determinant is smaller (Unto, 1991).

A demand analysis in Sri Lanka revealed that household size is inversely correlated with private outpatient usage, with differences of magnitude across different classes (Pallegedara & Grimm, 2017). Household size is also reported as a significant variable in a study of adult mortality in Russia (Denisova, 2010).

Demand analysis study in China revealed among others, that participants with health insurances are more prone to visit provider of healthcare (Dong, 2016). In another local study in Kedah, insurance is one of the enabling factor towards the demand for healthcare (Samsudin et al., 2013).

4.0 Conclusion

Healthcare demand was pertaining to healthcare utilisation based on types of healthcare providers and types of services provided, health status and also health expenditure. The determinants of healthcare demand were; age, gender, ethnicity, education, occupation, household income and size, marital status, family size, health status, health problems and duration, medical insurance coverage, medical and non-medical costs or price, health expenditure, distance to provider and waiting time. Healthcare demand’s determinants can assist in resource allocation to be group-specific. Moreover, the nation’s health system is able
to provide more effective care to the population. This will subsequently assist policymakers with evidence of demand-side evidences for a more effective pattern of health behaviour.

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Declaration

The authors declare that this manuscript has never been published in any other journal.

Authors contribution

Author 1: information gathering and manuscript drafting
Author 2: editing and review of manuscript
Author 3: editing and review of manuscript
Author 4: initiation of idea, final review and editing of manuscript

References


