

Chapter 2

Demand for Health Care: Theories and Evidence

To develop a conceptual framework, which would allow us to examine how an individual's health care seeking behaviour gets influenced by different factors, we first need to review the literature (both theoretical and empirical) which have addressed similar kinds of issues. In this chapter we shall review the select theoretical and empirical literature which have analysed the role of different factors in explaining individuals' health care seeking behaviour. The lessons drawn from the critical review will help us develop our conceptual framework to address the issues we are interested in.

The chapter is divided into the following sections: Section 2.1 briefly reviews the theoretical part of the literature. Section 2.2 reviews the empirical findings. Section 2.3 makes a few critical notes on the review. The critical notes intend to guide us to develop our own conceptual framework and empirical analysis in the subsequent chapters. Section 2.4 summarises the discussion.

2.1 Theoretical Development

Economists became interested in the estimation of demand for health care in the early 1960s. Demand models during this time were simple reduced form equations derived from the assumption of utility maximisation. The demand for a particular health service used to be measured by the number of visits to a health facility. The demand for health care was hypothesised to depend on the price of that service, prices of alternative services, household income and tastes.¹ One of the important studies during this period was by Rosenthal (1964). The study tried to explain and predict the utilisation of short-term and special non-federal hospital facilities in continental United States. The conceptual model for this study was based on conventional demand theory. The study used linear multiple regression analysis and the demand model incorporated economic variables (viz. price and income variables) and socio-demographic variables (viz. age distribution, marital status, sex distribution, degree of urbanisation, education, race, population per dwelling unit) representing aspects of consumer tastes and preferences.

¹ For example, Weisbrod (1961), Feldstein (1964) and Rosenthal (1964) made attempts to explain and predict the utilisation of health care facilities and services using demand models. Fein (1967) also tried to isolate major factors affecting the demand for various health professionals.

This kind of studies mainly suffers from two limitations. The first limitation is associated with using utilisation data as a proxy for demand. Utilisation seems to be the market equilibrium, as it is determined by the interaction of demand and supply forces. But in the absence of data on demand, utilisation data have been used as the next best alternative. Second, where health care facilities of varying qualities exist, it is misleading to aggregate them and reduce to a single measure of utilisation. As Goldman and Grossman (1978) rightly pointed out that when the quality of a good varied, quantity in physical units would be a misleading measure of total consumption. They argue that difference in quality are a distinguishing feature of the market for physicians' services.² Besides neglect of quality-related aspects, the demand model developed in the 1960s did not take into account the role of time in the demand for health care.

The importance of time as a crucial determinant of demand was for the first time systematically analysed by Becker (1965). Leveson (1970) and Holtman (1972) extended the application of Becker's model to analyse the demand for health care. The important role of time was explicitly recognised by Grossman (1972), Acton (1975) and Christianson (1976) and they too made substantial contributions toward modelling demand for health care by explicitly including the time element.

Grossman (1972) argued that what individuals demand when they purchase health care is not health care *per se* but good health. He first constructed a model of demand for health, and then derived the demand for health care from the demand for good health. He argues that health is demanded by an individual for two reasons: (1) as a consumption commodity, it directly enters their preference function; (2) as an investment commodity, it determines the total amount of time available for market and non-market activities. An individual combines health care with other inputs and produces good health, and good health enters the utility function. One of the important propositions of his model is the following: an individual's demand for health and health care should be positively correlated with her wage rate.

² However, this point (aggregating quantities of different quality) was recognised in other contexts and served as the rationale for estimates of quality of automobiles and houses based on the imputed value of these goods. See Griliches (1961), Muth (1969), Griliches (1971), Triplett (1971), Rosen (1974), Ohta and Griliches (1975) and Straszheim (1975).

Acton (1975)³ argues that if out-of-pocket payment falls (due to insurance or subsidised government health care), the non-monetary factor like time price becomes more influential in determining the demand for health care. In other words, the demand for free health care should be more sensitive to changes in time prices than demand for nonfree health care, since time constitutes a greater proportion of the total price when the health care is free compared to a situation when it is priced. The time costs tend to be higher in case the distance between the individual and the facility is high. According to Acton, distance matters to an individual because of three reasons: (1) higher distance increases transport cost; (2) higher distance implies higher time cost; and (3) higher the distance of the facility from the individual, higher is the informational cost to know about quality of health care. Lower distance implies lower informational cost because individuals have less difficulty in finding out the quality and suitability of a close-by health care provider than in finding out a distant one. As regards the impact of income on demand for health care, he made a distinction between non-earned and earned income. Earned income is that portion of income which depends on the hours an individual spends on income earning activities. An increase in non-earned income, according to him, will increase the demand for health care, but in the case of increase in earned income (due to increase in wage rate) it is difficult to say *a priori* what the possible impact would be. An increase in earning per hour increases the demand for health care through income effect, but at the same time decreases the demand for time-intensive activities, since it increases the opportunity cost of time.

The major contribution by Christianson (1976) lies in his recognition of the discrete nature of decisions in health care demand. Christianson argues that in a given period of illness an individual makes three decisions. The first decision that an individual must make after recognising the presence of a health problem concerns the need to seek health care. Next, those individuals deciding to seek health care must choose a particular health care provider. The final decision occurs when the individual determines the number of visits which she will purchase.

However, the quality of health care is not an important issue in the structural specification of these models, except the gravity models. The gravity model hypothesised that the probability of selecting a hospital is positively related to its size and negatively related to its distance

³ The underlying theoretical model for this study was developed in detail in his two earlier papers, Acton (1973a), Acton (1973b) which were basically based on the work of Becker (1965), Grossman (1972) and Holtman (1972).

from the patient's home. Generally the larger and research oriented hospitals are higher level health care facility in the referral system and indicate higher quality of care compared to the health facilities of the lower level. Therefore quality consideration was implicit in the Gravity model. In the late 1980s the study by Gertler, Locay and Sanderson (1987) [hereafter GLS87] for the first time systematically modelled the demand for health care in a conditional choice framework which explicitly took into account the competing health care providers that individuals might select. The main objective of this study was to estimate the demand for health care in order to examine the feasibility and desirability of user fees. This study was followed by a series of studies. Many of them followed almost the same structural and reduced form model.

Although GLS 87 followed the basic neo-classical framework of utility maximisation of Grossman (1972), the structural model of GLS 87 is substantially different from that of Grossman and others in many important aspects. Here, an individual's decision to go for health care and choice of health care providers is considered in a static discrete choice set-up which assumes that the individual is concerned with short-run utility maximisation and she has access to a limited number of health care providers. The individual first decides whether or not to go for health care. Once decided to go for health care, she then decides which health care provider to select from a set of alternative health care providers. Consumption of health care implies both benefits and costs. It benefits the individual since it is expected to improve the health status of the ill individual. It entails both monetary and non-monetary costs. It entails monetary cost because the money spent on health care is not available for consumption of non-health care goods. It entails non-monetary cost because time spent in seeking care is not available for other income earning activities. The individual is supposed to choose from a set of health care providers, each of which has a different potential impact (efficacy) on her health. This efficacy depends on health care provider's skills and individuals' characteristics (e.g. health status, health problems, ability to implement the recommended treatment, and so on). Based on this information and her characteristics (health status, types of medical problems, and incomes), the individual chooses the alternative which gives her the maximum utility.

Based on the methodology applied, the empirical studies which examined the effect of different factors on demand for health care can be divided into two broad groups: One category of studies has an underlying behavioural model – either Grossman or McFadden's

Random Utility Maximisation or a combination of both.⁴ They use the data to estimate different parameters of the behavioural model.⁵ The other group of studies does not have any underlying behavioural model but they use summary statistics to describe different aspects of data and make inferences.⁶

2.2 Review of Empirical Findings

In this section we review the empirical findings of selected studies (irrespective of the methodology they have used) which have attempted to examine the effects of different factors on individuals' demand for health care. Information about the contexts of and the approach followed by select studies is summarised in Table A 2.1 in Appendix. Below we present the empirical findings under the following headings: user fees or price, income, distance or time costs, quality, and other factors.

2.2.1 User Fees or Price

In the traditional demand theory own price is the most important argument in determining the demand for a good. In case of health care the empirical evidence is slightly mixed. While most of the studies found price as an important and significant determinant in the demand for health care, there are a few studies, mostly in the context of developing countries, which found insignificant price effect.

In the context of developed countries, the studies by Davis and Russel (1972), Rosset and Huang (1973), Phelps and Newhouse (1974), Holtman and Olsen (1976), Goldman and Grossman (1978), Colle and Grossman (1978), Manning, Newhouse, Daan, Keeler, Benjamin, Leibowitz, Marquis and Zwanziger (1987) found price as a significant factor in the demand for health care.

In the context of developing countries the studies by Mwabu (1986, 1988, 1989), Gertler, Locay and Sanderson (1987), Dor, Gertler and van der Gaag (1987), Alderman and Gertler (1989), Gertler and van der Gaag (1988, 1990), Yoder (1989), Abel Smith and Rawal (1992),

⁴ See Grossman (1972) and McFadden (1981).

⁵ For example, Colle and Grossman (1978), Akin, Griffin, Guilkey and Popkin (1986), Gertler, Locay and Sanderson (1987), Gertler and van der Gaag (1988, 1990) Mwabu, Ainsworth and Nyamete (1993), Akin, Guilkey, Hutchinson and McIntosh (1998), Yip and Orbeta (1999), Gupta and Dasgupta (2000), Sahn, Younger and Genicot (2003) and so on.

⁶ For example, Creese (1991), Abel-Smith and Rawal (1992), Mwabu, Mwanzia and Liambila (1995), Weaver (1995), and so on



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Mwabu, Ainsworth and Nyamete (1993), Litvack and Bodart (1993), Lavy and Quigley (1993), Weaver (1995), Akin, Guilkey and Denton (1995), de Bartolome and Vosti (1995), Haddad and Fournier (1995), Ii (1996), Akin, Guilkey, Hutchinson and McIntosh (1998), Hotchkiss (1998), Yip and Orbeta (1999), Gupta and Dasgupta (2000), Sahn, Younger and Genicot (2003) found price as an important factor. On the other hand there are a few studies (Heller 1982; de Ferranti 1985; Akin, Griffin, Guilkey and Popkin 1986; Birdsall and Chuhan 1986; Schwartz, Akin and Popkin 1988; Guilkey, Lacroix and Alihonou 1992; Akin, Guilkey, Hutchinson and McIntosh 1998), which found price effect small or insignificant.

Although most of the studies find price as a significant determinant of demand for health care, there are differences across the studies in terms their findings on the degree of price sensitivity. For example, the studies by Holtman and Olsen (1976), Alderman and Gertler (1989), Ii (1996) and Gupta and Dasgupta (2000) found very small price elasticities. Gertler, Locay and Sanderson (1987), Gertler and van der Gaag (1988, 1990), Alderman and Gertler (1989), Ching (1995), Ii (1996), Yip and Orbeta (1999), Sahn, Younger and Genicot (2003) found falling price sensitivity with increase in income. On the other hand, Akin, Guilkey and Denton (1995) found that low sensitivity to price did not vary across income classes.

2.2.2 Income

We have seen in the previous sub-section that many studies found price elasticities falling with increase in income. This indirectly indicates that income is positively related to the demand for health care. Whenever explicitly considered, income turns out to be positively related to demand for health care. However there are some studies which did not find income as an important factor or found very low income elasticities.

The studies by Grossman (1972), Acton (1975), Mwabu (1989), Lavy and Quigley (1993), Mwabu, Ainsworth and Nyamete (1993), Ii (1996), Yip and Orbeta (1999) all found the demand for health care positively related to income, whereas Heller (1982), Akin, Griffin, Guilkey and Popkin (1986), Akin, Guilkey and Denton (1995), de Bartolome and Vosti (1995) did not find significant income effect. Dor and van der Gaag (1988), Alderman and Gertler (1989), and Gupta and Dasgupta (2000) observed low income elasticities.

There are studies which observed that individuals' sensitivity to travel time, travel distance, waiting time, or quality of health care varied considerably with income. For example, Holtman and Olsen (1976) found that the lowest income class was most sensitive to waiting

time (and money price) but they did not find any empirical evidence in support of their theoretically derived hypothesis that the ratio between the elasticity of demand with respect to price and elasticity of demand with respect to waiting time falls as income rises. Lavy and Germain (1994) found that the poor were disproportionately more responsive to changes in distance compared to the rich. Weaver (1995) found that patients with more income waited less time to seek care and were less likely to be referred than other patients. Li (1996) found that an increase in income increased the likelihood that people would use a formal provider (i.e. provider with better quality). Yip, Wang and Liu (1998) found that individuals with higher incomes were willing to pay higher cost to bypass village level facilities and visit county level hospitals. Akin and Hutchinson (1999) observed that bypassing behaviour was not very different across income groups. Paul (1999) found that bypassing national health care facilities in favour of superior foreign providers was more common among the wealthier residents.

2.2.3 Distance Cost or Time Cost

Most of the studies which considered travel distance or travel time as a factor influencing the demand for health care found them significant. While some studies considered distance as the relevant variable, other studies considered travel time or the value of travel time as the relevant variable.

The studies by Morrill and Earickson (1968) and Roghmann and Zastowny (1979) found that an individual's choice was influenced by distance decay (which means distance discourages utilisation). The distance decay hypothesis was later modified into the Gravity Model⁷ and it was applied to understand the factors influencing hospital utilisation. The Gravity Model, in this context, asserts that the probability that a hospital will be chosen by an individual varies directly with size and indirectly with distance. The studies by Folland (1983), Cohen and Lee (1985), Erickson and Finkler (1985), McGuirk and Porell (1984), Dranove, White and Wu (1989) all found empirical support in favour of the gravity model. Erickson and Finkler (1985) found hospital location as a significant factor.

⁷ The Gravity Model is a variant of the Probabilistic Choice Model. The Gravity Model in the present context, suggests that the probability of selecting a hospital is positively related to its size and negatively related to its distance from the patient's home. For empirical attempts on Gravity model, see Morrill and Earickson (1968), Shuman, Hardwich and Huber (1973), Schneider (1966), Pyle and Lauer (1975) and Taket and Mayhew (1981).

The other studies which found travel distance or travel time as significant in determining demand for health care are Acton (1975), Gertler, Locay and Sanderson (1987), Gertler and van der Gaag (1990), Mwabu, Ainsworth and Nyamete (1993); Lavy and Quigly (1993), Litvack and Bodart (1993), de Bartolome and Vosti (1995), Ii (1996), Akin, Guilkey, Hutchinson and McIntosh (1998), and so on.

Holtman and Olsen (1976) found waiting time as important. However, Heller (1982), did not find travel time as significant. Lavy and Germain (1994) found that the poor were disproportionately more responsive to changes in distance compared to the rich. Develay, Sauerborn and Diesfeld (1996) found transport cost as one of the important determinants of utilisation of modern providers.

2.2.4 Quality

Except a few studies, the quality of care had never been considered explicitly as an important argument in the demand for health care till the 1970s. However, the role of quality as an important factor was implicit in the Gravity Model which hypothesised that the probability of selecting a hospital was positively related to its size. The studies by Morrill and Earickson (1968) and Roghmann and Zastowny (1979) found implicit empirical support in favour of the Gravity model and observed that the elasticity of demand with respect to distance was lower for larger, research oriented hospitals. Generally the larger and research oriented hospitals are higher level health care facility in the referral system and indicate higher quality of care compared to the health facilities of the lower level. Therefore all the studies which found empirical support in favour of the Gravity model indirectly showed that quality was an important factor. For example, Cohen and Lee (1985) find that the size of the hospital is a major attraction. They also find that general physicians are less important for poorer patients whereas the hospital service is more important for them. Similarly, Erickson and Finkler (1985) find that the effect of physician affiliation at any particular hospital is highly significant and in turn the level of physician affiliation at any particular hospital is significantly related to the overall hospital profile level.⁸ Many of these studies including Feldman (1975) and Goldman and Grossman (1978) found that individuals were ready to incur higher time cost in order to get better quality.

⁸ The profile level for any hospital is defined in terms of the presence of a residency programme, medical school affiliation, teaching status, the number of facilities (i.e. services offered), the number of personnel/bed, the percentage of affiliated physicians that are board certified and the price of the semi-private room (Erickson and Finkler 1985).

Not all studies, which considered explicitly the role of quality in the demand for health care, found quality as a significant factor. Moreover, the quality indicators used in these studies also varied from one study to another in most of the cases. Akin, Griffin, Guilkey and Popkin (1986) found that in no case the quality variables (approximated by the identity of the practitioner) were significant.⁹ However, strong movement of patients towards private physicians for illnesses perceived to be serious was an indication of, they argued, individuals' preference for quality. Ellis, McInnes and Stephenson (1994) did not find quality to be a significant determinant of a patient's choice of provider and in the case of inpatient care, the coefficient had the wrong sign.¹⁰

Mwabu (1989) found that unobservable clinic specific factors seemed to have important effects on household's choice of clinics. Abel-Smith and Rawal (1992) found that utilisation of non-governmental services was primarily because of better drug supplies. They found that availability of drugs was a much more important consideration for individuals than waiting time. Litvak and Bodart (1993) found that facility attributes that influence quality of care such as crowding, practitioner training and drug availability were significant determinants of choice of obstetric care provider. They also found that quality interacted in important ways with individual characteristics such as educational attainment. For example, drug availability had a significant influence on women with higher level of educational attainment.

Mwabu, Ainsworth and Nyamete (1993) find that the general availability of drugs is positively related to demand but the lack of significance of this result is perhaps related to the conflicting relation between the availability of specific drug and demand.¹¹ Lavy and Quigley (1993) find the availability and accessibility of treatment choices are very important in affecting the consumption of qualitative and quantitative aspects of medical care – more important than the price charged for services. Hotchkiss (1998) find that the facility attributes that influence the quality of care such as crowding, practitioner training and drug availability are significant determinants of choice of obstetric care. Lavy and Germain (1994) found that

⁹ They controlled for quality in modern facilities by examining whether the visitor to the outpatient facility was seen by the doctor; they used somewhat different variables to control for the quality of traditional healer.

¹⁰ Ellis, McInnes and Stephenson (1994) estimated patient's choice of provider using data from a household survey in Cairo, Egypt. Respondents were asked to recommend providers for particular types of illness and to describe the reasons for their recommendation. The number of times a quality related reason was given was used to construct a quality measure. This was then averaged across geographic areas for a particular provider types.

¹¹ However they argue that the empirical evidence that shortage of particular types of drugs is either positively or negatively related to medical care demand could be reconciled because shortages of these consumable inputs occur whenever demand is high relative to stock (Mwabu, Ainsworth and Nyamete 1993).

the provider infrastructure and staff had positive impact but the elasticities were low. Akin, Guilkey and Denton (1995) found that improvement in quality increased the use of health care, where quality was measured by three indicators: expenditure on care per person in population served, drugs availability and physical condition of facility. Haddad and Fournier (1995) found that inter-personal aspects of quality were more important than the technical aspects in influencing utilisation of health care. Akin, Guilkey, Hutchinson and McIntosh (1998) found quality showing strong influence on decisions of care use, where quality was measured by the indicators: availability of drugs, treatment hours and availability of different kind of facilities at the provider. Yip and Orbeta (1999) found that quality, on an average, had a positive effect on individuals' choice of health care provider, where quality is measured essentially by the process dimensions such as whether or not the physicians spend enough time, attitude of the health care staff etc. Akin and Hutchinson (1999) found concern for quality as the main reason behind bypassing the nearest cheaper public or private facility. Their results suggest that given the same service quality, individuals will visit the nearby clinic; but when quality of the service offered is appreciably lower, even care provided free of money cost and in close proximity will not be sufficient to attract many of the potential users. Paul (1999) found that concern for better quality was the main reason behind the wealthier bypassing the local domestic health care. Sahn, Younger and Genicot (2003) also found quality as an important determinant of demand for health care. This applies to the quality and availability of doctors/nurses, drugs and the clinic environment. The demand for health care will increase if people have the option to see a better doctor/nurse, get access to pharmaceuticals and attend a health centre, clinic and dispensary that is cleaner, has a toilet, water and a roof.

There are some studies which examined individuals' sensitivity to different quality-related dimensions of health care. For example, in the context of urban Fiji, Attah and Plange (1993) found that individuals gave more importance to art of care than availability of drugs and personnel, physical environment, technical quality, accessibility and inpatient food (Attah and Plange, 1993). In a similar study in Zaire, Haddad and Fournier (1995) found that women valued interpersonal qualities (i.e. respect, patience, courtesy, attentiveness, friendliness, and straightforwardness) more than the technical qualities. When they were asked about the two best qualities a nurse should have, the majority mentioned a relational component first and a technical component second. Mittal and Baldasare (1996) measured the effect of certain quality factors in a physician's practice, and found that physician's competence,

communication, respect, caring, taking time to learn history, and follow up treatment were weighted more heavily if the patients were not satisfied. The condition of the office environment and waiting time received lower weighting scores. Aldana, Piechulek and Al-Sabir (2001) assessed user expectations and the degree of client satisfaction and quality of health care provided by government hospitals in rural Bangladesh. They found that the most powerful predictor for client satisfaction with the government services was provider behaviour, especially respect and politeness. This aspect is much more important than the technical competence of the provider. It was also found that a reduction in waiting time was more important to clients than a prolongation of quite short consulting time.

In sum, it can be concluded that price, distance and quality of the health care are important provider level factors that mostly determine an individual's health care seeking behaviour. However, different studies have used different quality indicators, which are essentially a set of provider-level characteristics. Income or economic status is the most important individual-level characteristic that influences her health care seeking behaviour. An individual's degrees of sensitivity to price, distance, waiting time and quality of health care are also observed to vary with income.

2.3 A Few Critical Notes

A critical look into the theoretical and empirical literature clearly shows that unlike price of health care, the definition and measurement of quality of health care has gained very little methodological improvement over the years. Dubious definition of quality and ambiguous distinction between quality and price continue to be the major limitation of the existing literature. There are other problems too in devising proxies, modelling demand and inferences drawn. In this section we shall try to point out some of the limitations of the existing literature (reviewed above), which can help us develop a better conceptual framework for understanding the possible effects of price and quality of health care on individuals' health care seeking behaviour.

2.3.1 Ambiguous distinction between Quality and Price

The studies which explicitly considered quality of health care as a factor, mainly used some provider-level characteristics (such as availability of drugs, equipment, personnel, bed etc) as indicators of quality to examine individuals' sensitivity to quality. Trying to capture quality of health care in terms of these structural indicators can have serious limitations due to the

following reasons: First, capturing individuals' sensitivity to quality by using uniform set of quality indicators for all individuals irrespective of their preference ignores the fact that different individuals may attach different degrees of importance to different dimensions of quality. Moreover, individuals may value certain things as quality which cannot be captured in terms of objectively observable characteristics of providers. Second, many of these indicators may not be qualified as indicators of quality if one goes with the intrinsic meaning of quality. For example, if there is a provision to procure medicine or avail service of other medical equipment from outside the health care facility without any harmful delays in the treatment, then lack of medicine or medical equipment just add up to cost of health care without affecting the quality of health care.¹² Similarly, if it is observed that individuals are willing to incur higher time cost in order to get what they perceive as better quality, then higher waiting time cannot be qualified as indicators of poor quality of health care from individuals' point of view.

2.3.2 No Distinction between Outpatient and Inpatient Care

Only a few studies (e.g. Acton 1975, Ellis, McInnes and Stephenson 1994, Weaver 1995, Sahn, Younger and Genicot 2003) have made a distinction between inpatient and outpatient care. An individual's health care seeking behaviour can be different for outpatient and inpatient care. For example, Weaver (1995) found that the effects of user fees on patient behaviour were not the same for the outpatient and inpatient care. He also found that visitors to outpatient facilities who paid for care waited longer before seeking care but the inpatient care users did not. On an average, the price of inpatient care is substantially higher than that of outpatient care. An individual's trade-off between quality and price is expected to be very different when price is very high and when the price is low. As a result, individuals' health care seeking behaviour is expected to be significantly different for outpatient and inpatient care. So an analysis which does not make the distinction between outpatient and inpatient care may fail to understand individuals' sensitivity to quality and price of health care.

¹² The 'availability of drug' which is commonly used as an indicator of quality at the provider level can be problematic. This indicator is subject to endogeneity problem since availability at a particular time is the outcome of demand and supply forces. Demand may deplete supplies of these recurrent inputs. This endogeneity problem makes it difficult to measure the potential demand effects of quality improvement of this nature.

2.3.3. Effects of Model

First, not all the studies, which estimated the effects of different factors on individuals' health care seeking behaviour, incorporated provider's characteristics. The failure to incorporate variables, which are crucial to individuals' health care seeking behaviour, in the model would definitely result in misspecification problem. To get unbiased estimates, all the provider-level characteristics that are expected to significantly influence individual's health care seeking behaviour should be controlled. Second, studies that did not take into account the differences in quality across health care providers, would also result in biased estimates. If the quality is the same for all health care providers, then an individual is likely to choose the health care provider with lowest price. But if health care providers charging higher price also offer better quality, then estimated price coefficients are expected to be biased if quality differences are not taken into account. As a result the expected negative price effect may not be observed, since providers with higher price also provide better quality so that quality adjusted price (i.e. price per unit of quality) may be lower for the providers with higher price. Third, almost all the studies estimated the demand for health care from a sample of only ill individuals. Dow (1995), Akin, Guilkey, Hutchinson and McIntosh (1998) argued that estimation of demand for health care with samples of only the ill might bias estimates. In particular, Dow (1995) argues that the concept of price elasticity used by most of these studies is 'conditional' in the sense that it is estimated on the basis of those individuals who fell sick during the reference period. He went on to make a distinction between conditional and unconditional elasticities, where the latter indicates the demand for health care by all individuals irrespective of whether one is sick or not. Dow argues that conditional elasticity may be biased and can be used only in the short-run and not in the long-run. Finally, it has been found that the sensitivity of demand with respect to price and other variables is sensitive to the statistical model one uses (Bolduc, Lacroix and Muller 1996).

2.3.4 Proxies for Variables and Quality of Data

It is customary to collect information on some suitable proxies for income, prices and time costs, as the data on these variables are often not directly obtainable. However, questions can be raised on the suitability of some of the proxies used in these studies. For example, when a household spends on health care by 'borrowing or selling productive assets', neither permanent income nor consumption expenditure would be sufficient to capture the economic status of the household. As far as the data on the price of health care is concerned, most of the

studies used endogenous price information, which is not well suited for the estimation of demand. Use of endogenous explanatory variables may lead to biased estimates of the coefficients in the model. If the values of the price variables were partly or wholly determined by the behaviour of the individuals, it would result in statistical endogeneity problem. As far as time cost is concerned, in some studies, the travel cost is an imputed cost obtained by multiplying the travel time by the wage rate prevailing in the village.¹³ Valuing time in such a general way irrespective of the context and season may be misleading because value of time or the opportunity cost of time varies considerably depending upon the occupational nature of the household and seasons.¹⁴ Moreover, distance without any information regarding the means of transportation cannot capture the real cost of distance.¹⁵

2.3.5 Questioning the Inferences

In most of the studies, although the objective was to examine the sensitivity of individuals' demand for health care to changes in the price, distance/time or quality, the basic purpose from policy point of view was to examine the feasibility and desirability of user fees.¹⁶ The studies which found lower price sensitivity (or lower price elasticity) used the empirical finding as an argument to support increase in or introduction of user fees in government facilities. Since price elasticities are low, these studies argue, there is a scope for raising the price without any adverse effect on utilisation. The basic logic of this argument can very well be questioned on the ground that we cannot treat willingness to pay (WTP) and ability to pay (ATP) synonymously in the case of health care. The neo-classical economic theory does not make any conceptual distinction between WTP and ATP and it is assumed that if an individual is 'willing' to pay the price, she must somehow be able to do so. In health care, WTP and ATP cannot be treated as identical (Russel 1996). Expenditure on health care is often compulsory expenditure, rather than expenditure out of choice. An individual may often be forced to spend on health care by sacrificing some other basic commodities (like, basic

¹³ For example, Dor, Gertler and van der Gaag (1987), Gertler and van der Gaag (1988).

¹⁴ Mwabu (1989) pointed out that the opportunity cost of time varies considerably depending upon the season. For example, the opportunity cost of time of an agricultural household is expected to be higher during the wet season compared to the dry season.

¹⁵ Another limitation was that while calculating the value of time (i.e. the opportunity cost of time), these studies did not include the value of leisure. However, Gertler, Locay and Sanderson (1987) argued that adding the value of leisure would greatly complicate the model, which forced these studies to implicitly assume that the lost time comes at the expense of work or home production and not at the expense of leisure.

¹⁶ See for example, Gertler, Locay and Sanderson (1987), Mwabu, Mwanzia and Liambila (1995), Weaver (1995) and Hotchkiss (1998).

nutrition, education for the children etc) which can have long-run impact on their level of welfare.¹⁷

The additional price that an individual pays to a private provider over and above what she would have paid to a government health care provider is often interpreted as her willingness to pay for better quality. This argument misses out the important point that private providers are often characterised not only by better quality, but also by lower time cost. Therefore, the additional money that an individual pays at a private facility may be a combined willingness to pay for lower time cost or better quality or both.¹⁸

A few studies have assessed the welfare impact of increase in direct price in terms of loss of consumer surplus,¹⁹ which is obviously a narrow measure of welfare. It is reasonable to argue that a set of simple questions like the following can capture many important dimensions of the welfare effect of price hike: (1) Are more or fewer individuals utilise the health care provider after the price is increased? (2) To what extent do poor individuals delay seeking care when price is increased? (3) How do individuals belonging to different economic classes meet their expenditure on health care?

2.4. Summing Up

The review of literature clearly indicates that modelling demand for health care has experienced a substantial methodological improvement over the years - from simple reduced form equation derived from the assumption of utility maximisation to static short-run utility maximising discrete choice model. Although most of the studies, which explicitly examined the effects of user fees, distance/travel time, quality and income, found these factors significant, there are exceptions. Many of the studies observed that individuals' responsiveness to user fees, distance/travel time and quality varied with income level. Although, the price of health care has gained conceptual refinement and methodological improvement in measurement over the years, such refinement and improvement has not taken place in the case of quality of health care. The studies, which explicitly examined the effects

¹⁷ Similar argument is found in Dow (1995). Dow also questions the appropriateness of elasticity as a measure of real responsiveness and welfare effects. He argues that the high price elasticities of the poor may be an indication that the poor place a lower value on marginal units of health care than they do on other necessities.

¹⁸ If time costs were the same in both government and private facilities and if an individual spent higher money at private facilities, then the additional money she had spent at the private facility would have been considered as her willingness to pay for better quality.

¹⁹ For example, Gertler, Locay and Sanderson (1987), Gertler, van der Gaag (1990).

of quality of health care on individuals' demand for health care, have mostly tried to capture quality in terms of some provider-level observable characteristics. Trying to measure quality in terms of a uniform set of observable provider-level characteristics ignore individuals' diverse preference and unobservable dimensions of quality. Moreover, many of the provider-level characteristics cannot be purely considered as indicators of quality if one views quality purely from an individual's perspective. There seems to be other methodological problems in the existing literature relating to selection of proxies, formulation of the structural model and inferences drawn. All these call for an attempt to develop an alternative approach to define and measure health care quality, which would be more appropriate to explain individuals' health care seeking behaviour.

Appendix

Table A 2.1: Summary of contexts and approaches followed in selected studies on demand for health care

Study	Context	Approach
Acton (1975)	Demand for (outpatient) medical care in municipality hospital in New York	Theoretical model is primarily based on the work of Becker (1965), Grossman (1972) and Holtman (1972)
Christianson (1976)	Choice of outpatient medical care facilities in Wisconsin	Analysis based on purely statistical association between variables
Colle and Grossman (1978)	Utilisation of Pediatric Care in US	Statistical (multivariate logistic regression)
Goldman and Grossman (1978)	Demand for Pediatric Care in four health districts in US	Grossman Model and Hedonic Approach
Holtmann and Olsen (1976)	Demand for dental care in New York and Pennsylvania	Becker-type consumer choice model.
Erickson and Finkler (1985)	Determination of market share for each hospital in Pennsylvania	Multiplicative Competitive Interaction Model
Cohen and Lee (1985)	Hospital Utilisation in Rhode Island	Random Utility Model
Akin, Griffin, Guilkey and Popkin (1988)	Demand for primary health care services in the Bicol Region of Philippines	Used theoretical model proposed by Acton and modified by Heller
Gertler, Locay and Sanderson (1987) [In short GLS 87]	Demand for health care in urban Peru	Discrete choice model
Dor, Gertler and Gaag (1987)	Choice of medical care providers in rural Cote d'Ivoire	GLS 87 type of model
Gertler and van der Gaag (1988)	Demand for medical services in Cote d'Ivoire	GLS 87 type of model
Dor and van der Gaag (1988)	Demand of adults for medical care in rural Cote d'Ivoire	Used discrete choice model different from GLS 87 ²⁰
Mwabu (1989)	Household choice of medical Facilities in rural Kenya	Reduced form model similar to that of GLS 87
Abel-Smith and Rawal (1992)	Demand for health services in Tanzania	No behavioural Model
Lavy and Quigley (1993)	Demand for quality and intensity of medical care in Ghana	GLS 87 type of model
Mwabu, Ainsworth and Nyamete (1993)	Choice of Medical Treatment in Kenya	GLS 87 type of Model
Bartolme and Vosti (1995)	Choice between public and private health care for malaria treatment in Brazil	Model slightly similar to GLS 87
Haddad and Fournier (1995)	Utilisation of health services in Zaire	No behavioural Model
Akin, Guilkey and Denton (1995)	Demand for health care in Nigeria	Random utility model (nested mixed multinomial logit).
Mwabu, Mwanzia and Liambila (1995)	Utilisation of government health facilities in Kenya	No behavioural Model
Ii (1996)	Demand for medical care in urban Bolivia	GLS 87 type of model
Weaver (1995)	Demand for inpatient and outpatient care in Niger	No behavioural Model
Akin, Guilkey, Hutchinson and McIntosh (1998)	Demand for health care in Sri Lanka	Theoretical model developed by Behrman and Deolalikar (1988)
Hotchkiss (1998)	Demand for health care in Philippines	Random utility model (nested mixed multinomial logit).

²⁰ They started with the assumption of a general health-care demand function of the following form: $M = M(P, Y, H, Z)$; where M = demand for medical care; P = vector of prices including time prices; Y = measure of income; H = measure of health capital; and Z = vector of socio-economic variables.

Table A 2.1 continues

Study	Context	Approach
Yip, Wang and Liu (1998)	Patient choice of medical provider in rural China	Reduced form model similar to that of GLS 87 (McFadden's Radom Utility Model)
Yip and Orbeta (1999)	Consumer choice of health care provider in Egypt	Reduced form model similar to that of GLS 87
Gupta and Dasgupta (2000)	Demand for curative health care in rural India	GLS 87 type of model
Propper (2000)	Demand for private health care in UK	Used a model developed by Goddard and Smith (1998)
Sahn, Younger and Genicot (2003)	Demand for health care services in Tanzania	GLS 87 Model