

4 Analysis of Demand and Need

Demand

Demand is an economic concept which describes the quantity of a good or service per unit of time (e.g., aspirin tablets per year) that an individual or household will purchase and consume given the price of the good or service, prices of alternatives or related items, income of the individual or household, preferences, and other factors. It must be a quantity which the individual will actually be willing and able to buy. Demand is distinct from *need* which, in the context of health projects, can be seen as the level of health services which good medical opinion deems necessary to meet particular health targets. Problems arise in health planning when demand and need do not coincide. Individuals who demand health care when medical opinion suggests that they do not need it will waste resources. On the other hand, if individuals do

not demand health care when medically they require it, they will be jeopardizing their own health and that of others, if their condition is communicable.

Private sector providers are market-driven and plan on the basis of demand, while public sector projects are initially designed on the basis of perceived need. But even when need provides the idea behind a project, it is also necessary to consider individual and household demand for the services of the project. This is because even freely available services, for which there is no user fee, are not cost-less to individual users. A rural clinic may make immunizations or tablets freely available, but patients will still have to bear the costs of traveling to the clinic and waiting to be seen. How potential patients evaluate these costs relative to their perception of benefits from attendance at the clinic will determine whether or not they will use its services. A demand assessment will be needed to judge the scale of the clinic and the number of patients it can cope with.

An important distinction that arises in the analysis of health sector activities is the difference between utilization and demand. *Utilization* refers to the actual use of health services and facilities. An analysis of utilization looks at trends in use while an analysis of demand attempts to explain behavior patterns. Demand that differs from utilization will be unsatisfied. For example, there are more households who would like to visit a clinic than those who can actually do so. Planning, therefore, should aim to avoid unsatisfied demand, provided the demand corresponds with the perceived medical need.

A demand analysis is advantageous in knowing the impact of health projects and predicting the effects of health interventions. Although analysis of need will be based on epidemiological data and health targets for the population, demand analysis will assess the market for health services in the same manner as for any other commodity. Demand analysis can be conducted at many different levels. Because demand is based on economic theories of consumer choice, the individual is the most basic economic unit to analyze. Frequently, however, decisions are made at the family or household level. This is particularly true in children for whom decisions will be made by the mother or other adult family member. Demand by a household can be further aggregated to give the community demand, provincial demand, and national demand for health care. The correct market level will depend on the scale of the project and the objectives of the health intervention. For example, a reproductive health project might analyze the demand for family planning services by households with married women of reproductive age within the geographical vicinity for which the project was planned.

In analyzing the demand for health services and utilization rates, it is important to take into account the factors that influence this phenomenon. These factors include, but are not limited to, financial price (direct out-of-pocket expenses), household income

and wealth, travel time and travel costs to health facilities and service locations, waiting times, health status of the individual, the educational attainment of the individual (or mother in the case of children), and the household size-age-sex composition. Often, the special social and cultural norms of a DMC have far greater influence on demand and utilization patterns than economic and demographic phenomena. Nevertheless, income and childbearing tend to be among the most important determinants of health care demand in DMCs.

Demand analysis addresses the following sorts of questions. Which segments of the population are currently using health services? How does the use of health care vary with income level? Will beneficiaries be willing to cost-share? What effect will the proposed project have on the demand for private services and traditional medicine? Will alternative providers be “crowded-in” or “crowded-out”? What proportion of income do households spend on public services, private services, and traditional medicine and how will these proportions change with the introduction of the project? How can we design user fees to maximize revenue while maintaining access for women, the poor, indigenous peoples, and other disadvantaged groups? Will the targeted beneficiaries seek care? What are some of the possible unintended effects of the project? What are the most important economic and noneconomic barriers to seeking health and medical care? These are some of the main issues demand analysis attempts to address.

The primary objective of ADB’s assistance to the health sector will be to improve the health status of the poor, women, indigenous peoples, and other vulnerable groups. It is important to identify these groups and specify their number, geographic location, socioeconomic status, health status, and most pertinently, health needs. By careful delineation of their particular health risks, interventions can be designed to be more effective and efficient in targeting these groups. However, it is not enough to simply identify needy beneficiaries. Analysis must be undertaken to assure that the targeted groups will also participate in the program. Examination of current utilization rates and projections of the project’s impact can be useful in this regard. Analysis of data gathered via focus groups is a way to identify and overcome specific barriers. Interventions that take account of social and cultural norms have a much greater chance of success.

Demand analysis can also be conducted using household surveys. Most national statistical offices within DMCs conduct such surveys on a routine basis. Relevant data may be obtained from a national health survey, demographic health survey, or household expenditure survey. Occasionally, more specialized surveys addressing pricing policies and insurance schemes or containing detailed health examinations are conducted. Using existing surveys and associated statistical reports is a low-cost and relatively quick way to obtain basic information on household

utilization rates, household income, demographic composition, geographic location, and overall material well-being of households.

Price Elasticities and User Fees

In any demand study, it is necessary to consider the impact to households of the cost of using health services. For visits to clinics or hospitals, there will normally be costs even where user fees are not involved since patients will still have to bear the cost of traveling and waiting. But if a project can reduce these costs (for example, due to a more convenient location for the patients), this will stimulate health service use. This must be considered in planning the scale of the project. Most studies of demand for health and medical care in developing countries find price elasticities to be less than one in absolute value (implying that demand changes less than proportionately to price), although the results vary over a substantial range. Some estimates place the price elasticities for outpatient and delivery care as well as prenatal, well-baby, and immunization services at values very close to zero. The implications are that for such services, user fees would do little to discourage health and medical care use while serving the self-financing function. However, some analysts have reported estimates closer to unity, implying that user fees might undermine the goals of the project by discouraging participation by the targeted beneficiaries. Where user fees are to be introduced or raised significantly, or where nonfinancial costs to users are altered significantly by a project, the impact of such change on demand should be allowed for. There are several ways of measuring price elasticity of demand for health care services. *Box 3* summarizes the results of an important study on price elasticity of demand in Indonesia. This is categorized as an *experimental* method, which is ideal if sufficient financial sources are available for the study. The *behavioral* method, which is based on the past actions of the respondents, may be most appropriate for the typically resource-constrained developing country governments. Appendix 1 summarizes the advantages and weaknesses of different methods of measuring price elasticity of demand.

Charging for public health services, although politically unpopular, is under discussion in many DMCs. User fees in health have both advantages and disadvantages. On the positive side, the first and most obvious is that user fees help finance health and medical services by directly generating revenues at the point of delivery, rendering the services at least partially self-financing. This is increasingly important as DMCs seek to maintain or expand their social services under binding resource constraints. Second, public providers can earn operating profits on services

Box 3

Health Price Elasticity Estimates: Indonesia

The most rigorous way of estimating price elasticity is to use data from randomized controlled tests which allow user charges to be experimentally varied, holding other influences on demand constant. Such data were made available in Indonesia for the provinces of Kalimantan Timur and Nusa Tenggara Barat. The study design was integrated into the local decision-making body and rather than raising fees everywhere in the two provinces, fee changes were staggered to generate price variation based on an experimental design. User fees were increased in health centers in some districts but not in others. The study assesses not just the impact of higher fees on demand for public health centers but also their effect on access to health care, since some who cease to use public facilities in response to higher fees may switch to private providers. Of those who cease to use public facilities, those switching to the private sector are distinguished from those relying on self-treatment or ignoring their health condition. In addition, the study collects information on how private providers (whether doctors, nurses or paramedics) respond to higher public sector charges. In general, there is a positive response, which is highest among nurses and paramedics in rural areas; on average, the rise in charges by the latter is nearly 60 percent of the proportionate increase in health center charges. Other things being equal, for a given rise in health center fees, the larger the rise in charges by competing private suppliers the greater will be the decline in access to health care. The price elasticity estimates from the study are shown in the table below. They give the ratio of the proportionate change in demand (as measured by visits to health providers) for a given proportionate change in price, allowing for the impact of higher public center fees on the charges of private providers. A figure of -1.07 implies that a 10 percent change in user fees is matched by a 10.7 percent decline in use of health facilities; a figure of -0.01 means that a 10 percent rise in fees leads to only a 0.1 percent decline in use.

Price Elasticity of Demand for Public Health Center Visits and Visits to all Providers

	Children		Adults		Seniors	
	Urban	Rural	Urban	Rural	Urban	Rural
Visits to health centers	-1.07	-0.63	-1.04	-0.01	-0.45	-0.47
Visits to all providers	-0.48	-0.49	-0.70	-0.01	-0.22	-0.39

The figures in the second row of the table give total demand elasticities and in all but one instance, are below the figures in the first row relating to health centers only. Since total demand falls by less than demand for health centers, this implies that for all but one group, some patients switch to other providers in response to the increase in health center fees. Hence, the price elasticity estimates for health centers alone will give useful information on the effect

Box 3

Health Price Elasticity Estimates: Indonesia *(continued)*

of higher fees on health center revenue, but will not give the full picture of the effect of higher fees on access to health care. An elasticity of above unity implies that raising fees will not bring in extra revenue since quantity will decline proportionately more than the rise in price. This is only relevant in urban areas, not in rural ones, where raising fees will bring in extra revenue. In urban areas where it is likely that more private alternatives are available, the difference between the total elasticity and health center elasticity is greatest. This is particularly the case for children, where the total elasticity is about half the health center elasticity, implying that roughly half of those who switched from using health centers will seek private alternatives. The study also shows that the reductions in utilization of health centers are not merely for minor conditions since after the increases, there was evidence of higher incidence of infectious disease and longer duration of illness. The implication is that while higher fees are only likely to raise more revenue in rural areas, the policy will have adverse effects on health care. If the government chooses to raise fees, there is a case for using the revenue to finance a subsidy program to protect the health of the more vulnerable.

Source: Gertler, P. and J. Molyneaux. 1996. *Financing Public Health Sector Expenditures through User Fees: Theory and Evidence from an Explicit Social Experiment in Indonesia*. Santa Monica: RAND.

that are of high demand in the health care market and use these excess revenues to cross-subsidize services to needy beneficiary populations. This practice combines the financing and equity objectives of health care policy. Third, public sector user fees may stimulate private sector activities as consumers substitute private services for public care in response to charges. Fourth, implementing even modest user fees may raise the consciousness of beneficiaries and give them a sense of value and ownership in the services and products they receive. This can increase compliance and give rise to fuller participation, thereby improving health outcomes and leading to more medically efficacious and efficient programs.

On the negative side, user fees generally have a high administrative cost; and where they have been used in the region, they have only financed a relatively small proportion of operating costs of health projects. Second, implementing user charges in the public health sector may lead the private sector to raise their fees, further limiting uptake of health services. Third, where the services involved have significant external effects (like prevention of contagious disease), by discouraging use, charging will limit the effectiveness of control of the disease. Finally, and often critically, user charges are likely to have their most significant impact on the use of the services by the poor and vulnerable. There is empirical evidence that price elasticity

of demand for health services is inversely related to income, so that it is those with the lowest incomes who curtail their demand proportionately more for a given rise in charges.

The imposition of user fees is frequently criticized as a policy with unfavorable equity consequences. Formally, this depends on whether the poor benefits more from a dollar of health subsidy than from what they would pay in taxation, or the cost of deficit financing to finance the dollar of subsidy. Although there is empirical evidence on the regressivity of user fees, free care in general may not entirely remove inequities because time and travel costs replace price as a rationing mechanism. When health care is financially subsidized, waiting time, travel time, and travel costs become more important in rationing the use of services. Because the geographical dispersion of facilities, particularly those of higher quality, provides favorable access to the rich, this group will face lower time and travel costs. In relation to the rich, therefore, the poor will face higher real costs even when the user price is zero.

The formal economic case for user subsidies in health can be summarized around the following principles.

- (i) Subsidies should be higher where social gains exceed private gains due to the presence of health externalities, most obviously in the case of communicable diseases.
- (ii) Subsidies should be higher for those services where public care is superior to private, in the sense that it yields better health outcomes. If the alternative to public care is an untrained pharmacist or an ineffective traditional healer, the case for introducing or raising user charges will be weak.
- (iii) Subsidies should be higher for those services of high quality for which demand is elastic. The higher the price elasticity, the more demand will be reduced for a given price increase. Hence, the more users will be discouraged from accessing health facilities.
- (iv) Subsidies should be higher for those users whose health demand is price elastic. Again, these individuals will be the ones whose use of health facilities is most discouraged. Insofar as the poor have a more price elastic demand than the rich, there is an efficiency argument for subsidizing the poor, which is distinct from the equity or distributional case.
- (v) Subsidies should be higher for those services and in those areas where there are limited private alternatives. Subsidies will have weaker health impact if they only cause users to shift from private to public suppliers. They will have the strongest impact when they encourage new utilization so that illnesses that would otherwise go untreated are now treated. This implies that certain preventive services and health facilities in rural areas should be subsidized because of the lack of private alternatives.

The two competing factors that must be balanced in health pricing are: the need to mobilize revenue for the sector, and the need to minimize the adverse impact of new or higher charges on the use of health services and thus on health status. From the point of view of minimizing damage to health status, strong candidates for subsidization are services or groups for which higher prices have a strong negative impact on health utilization (that is, where total demand is price elastic). On the other hand, where demand is price inelastic, more revenue can be raised from higher charges, creating a weaker impact on utilization and health status; although for some poor families, higher charges may substantially reduce real income with inelastic demand. *Box 4* summarizes some of the main implications of user charges.

Box 4
Illustrations of Implications of User Charges

Charges	Elasticity	Use	Other Income	Private Provision	Macro
yes	<1.0	-	-	+	+
yes	>1.0	-	+	+	-
no	n.a.	+	?	-	-

Notes:

Charges	refer to either increases of existing user charges or charges imposed by a new project.
Elasticity	is price elasticity of demand for health services supplied by a project.
Use	is change in uptake of health services relative to a previous situation either with lower charge or no charge (for a new project).
Other Income	is real income after deduction of health and health-related expenditure (situations covered refer to short-run effects since, in the long-run, improved health should raise incomes).
Private Provision	refers to change in competing private for-profit suppliers (price rises for public providers are assumed to lead to greater private supply).
Macro	refers to change in government macro budget position.
n.a.	is not applicable.
Sign (+/-)	indicates direction of change.
?	refers to ambiguous outcome.

The arguments above can be used to identify certain categories of patients and services for which fees should be heavily subsidized or considered for complete exemption. For example, there are substantial positive spillover effects from the prevention and treatment of certain communicable and infectious diseases and adequate private provision is often lacking. In addition, maternal and child health programs are relatively cost-effective and may generate substantial resource saving through prevention. Moreover, women and children may be disproportionately represented among the economically disadvantaged. Based on such criteria, a number of categorical exemptions can be constructed.

Exempt Patients

Children under 5 years of age
Individuals from low-income households
Pregnant and lactating women

Exempt Services

Immunization services
Family planning services
Antenatal and postnatal clinical services
STD clinical services

Exempt Illnesses

TB, STDs and HIV/AIDS
Antenatal complications of pregnancy

Exempt Areas

Rural clinics

The most effective means of implementing an exemption scheme would have to be considered. Some of the issues discussed in this section are illustrated in Box 5 with reference to an ADB project in Pakistan.

Box 5

Need and Demand Illustration: Maternal and Child Health Services Pakistan

Maternal and perinatal conditions account for roughly 12 percent of the losses of healthy life due to disability and premature death in Pakistan. A sector review revealed that only 28 percent of pregnant women use rural health facilities for antenatal services and of these, only two-thirds receive tetanus toxoid immunization. Over 90 percent of rural deliveries are performed at home. Rural health facilities are not meeting the needs of mothers and babies. From sample data, one-third of facilities has no female staff, which is seen as a precondition for effective maternal and child-care. Only 10 percent of facilities were doing growth monitoring of children and only slightly more than 10 percent reported nutrition education and demonstration sessions.

In surveys of potential users of maternal services, reasons given for not using existing facilities include unavailability of medicine, poor service quality, and distance from home. To meet the objective of improving the health of mothers and babies, the sector review showed the need for a project to develop a package of services to address women's nutritional, family planning, and pregnancy-related health needs (TA 2577-PAK: *Women's Health Project*, for \$500,000, approved on 4 June 1996). However, demand for such services depends on uptake by mothers, which will be a function of social attitudes and information as well as cost and, in terms of time, any user fees.

A major component of the Project involves matching demand with need by developing outreach programs for local communities to raise awareness of women's health issues, strengthening existing programs that involve female community-based workers, and developing a network of community health committees. In addition, the Project will help identify new mechanisms for cost-recovery through funding of willingness-to-pay studies and focus group inquiries to assess the scope for recovering some of the operating costs of improved maternal and child health services from beneficiaries.

A form of user charge is already widely used in the public health sector in Pakistan; but where price elasticity is above even a modest level of -0.50 , there is still a real risk of weakening the health objectives of the Project by causing women to shift back to self-care or untrained practitioners. One possible means of discouraging this trend is to ensure community control over the revenue proceeds of user charges so that those paying the fees can see them reinvested in the local health facility.

Focus Group and Community Interviews/Rapid Appraisals

Formal methods of demand analysis, especially on price elasticity, are summarized in Appendix 1 and in *Box 3*. Rapid appraisals lie between formal and informal modes of data collection used to inform project or program conceptualization, formulation, and evaluation. Where detailed household surveys are not possible because of the limited time and financial resources, rapid appraisal survey methods can be relied on. There are five methods of rapid appraisal for data collection:

- key informant interviews,
- focus group discussions,
- community/group interviews,
- structured direct observation, and
- informal surveys (Kumar, 1993).

There are, however, limitations in rapid appraisal methods:

- the reliability and validity of the information generated can be questionable in many instances due to factors such as the use of informal sampling, individual biases of the investigator/interviewer, and the difficulty in recording, coding, and analyzing the quantitative data;
- they do not generate quantitative data from which generalizations can be made for a whole population; and
- the general credibility of these methods is low compared to formal survey methods.

These limitations should be weighed against the obvious strengths of rapid appraisal methods. Such methods can rapidly generate relevant information with relatively low investment of resources. Moreover, experience shows that they can provide in-depth understanding and information in the project or program conceptualization and design. Nevertheless, rapid appraisal methods should be relied on with due regard to the purpose of the study, availability of time and resources, and more importantly, the nature of the information required. Focus group discussions, community interviews, and structured direct observations have been used in rural health sector projects, particularly in data-scarce situations. *Box 6* describes the application of a direct observation approach to generate data on the operational effectiveness of primary health care services in the Philippines.

Box 6

Rapid Appraisal through Direct Observation: Primary Health Care in the Philippines

In the late 1980s, a USAID-financed Project was conducted in several countries to strengthen primary health care delivery. In the Philippines, an important aspect of the Project was to use a novel approach of direct observation to collect information on the weaknesses in the performance of health care workers, particularly in relation to pediatric services. Direct observation involved placing teams of observers in rural health units and requiring them, as unobtrusively as possible, to complete narrowly defined forms that required yes/no answers to questions on operational procedures, such as "Did the health worker take the child's temperature?" or "Did the health worker read the child's weight correctly?". The aim was to minimize inter-observer variation by avoiding judgmental questions. Useful information was obtained on the problems in the delivery of health care at the local level. For example, in the direct delivery of services, common problems found included:

- patients diagnosed with acute respiratory illness were not asked whether tuberculosis was present in the household, even though this would have an important bearing on type of treatment required;
- mothers were not cautioned against continuing to feed children suffering from diarrhea, even though there is a strong tendency for mothers to withhold food when children are sick ;
- failure to accurately inform the mother regarding timing and administration of treatment dosage; and
- mothers were not involved in the plotting and weighing process for monitoring child development, which was itself not always carried out accurately.

Information obtained from this process of direct observation was used by the Department of Health to strengthen training programs for nurses, midwives, and their supervisors. However, despite the term "rapid appraisal", this approach can be very time-consuming.

Source: Blumenfeld, S., M. Roxas and M. de los Santos. 1993. Systematic Observation in the Analysis of Primary Health Care Services. In *Rapid Appraisal Methods*. Edited by K. Kumar. Washington, DC: World Bank.