

Health Economics

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Week – 07

Lecture 31- Health Systems

Welcome, friends, once again to this NPTEL MOOC module on health economics. This module is considered to be a little different than the existing modules because of its coverage and the latest debates. Mainly this is especially relevant after COVID-19, when lots of emphases has been given by different health systems and by different frameworks because it has been felt in the world how health systems are functioning and why these functions are not sufficient. In the pretext of this, I think it is good to study the economics of health systems. This is the unit we have mentioned, and this first lecture is on health systems. We will understand in this lecture the organizational structure that is relevant for how much funding is actually available, how it is utilized, and to what extent rationing is required, and what the institutional structure and incentives really shape the system better in terms of their efficiency and especially incentive to efficiency implicit in the alternative system is quite relevant.

Coming to the part of the health system is through funding and rationing. The first question is what should be the proper level of healthcare funding, and then what is the need? Especially when we are saying the proper level of healthcare funding, we are supposed to debate about healthcare funding. The political debate is the most important aspect of healthcare function and funding. It is to be asserted that all healthcare needs should also be met.

Then, we will also emphasize the definition of need. What is called need? On the basis of need, only funding is actually met or addressed. So, how do we define the need? However, defining the need-based approach is very complicated, and how to simplify that is part of the discussion. So, need is not the size of the health problem the person is dealing with but rather the feasibility of a successful intervention to eliminate or lessen that health problem, as Matthew mentioned in his paper in 1971. So, successful intervention is the focus on eliminating and lessening the problems in the healthcare system.

So, it is not just the size of the problem that really matters so far as the need is concerned. Therefore, need is the ability to gain from a service, and it should be met if the benefits outweigh the cost. To understand the need and the fund allocation, we should understand the basic demand and supply function, where the need-based approach, the willingness to

pay, etc., can clearly be addressed, so where we will be discussing the marginal social value or social cost or the private valuation of any services, health services particularly. So, the help of demand and supply matters.

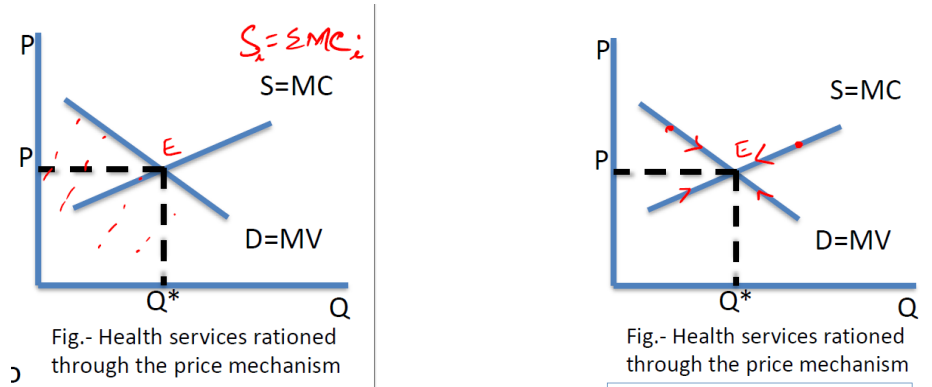
Last time, we clarified in our previous lectures how demand and supply define the contract rate for the buyers to afford any healthcare available and to what extent discounts or rationing in terms of access should be provided. It starts with the basic framework of marginal valuation related to the services or the commodities as opposed to the cost. Therefore, the demand curve can be visualized as an individual's own calculation and valuation that is usually measured through a willingness to pay for the commodities and services. So, as I have already discussed in my very first week of the module, there is a demand for and supply of healthcare.

Here, we are reiterating the structure in terms of the benefits received when we are saying demand curve, left-hand side, or the left portion. Basically, these areas define who places the most value on the benefits and how they are ready to pay. And at the right-hand, lower end of the demand curve are those who place a relatively low value on the advantages to themselves and are hence willing to pay less. Basically, again, at the lower end and upper end, it is quite obvious that the valuation would be different. At the upper end, the valuation is through the elites, and at the lower end, it is the non-elites are the other classes. So, assuming consumer sovereignty, Q^* is the level of provision, and by setting the price at the level of marginal cost, as we know supply is a sum of the marginal cost curve or the integration of the marginal cost curve at i^{th} level of the supply. If a price is set, it is setting at a certain level of marginal cost.

If that is perfectly matched with the marginal valuation by the buyers or the demanders who are demanding for the health services, then equilibrium quantity is settled and that quantity is the best quantity to be a system should be providing. So, the price mechanism is the simplest way to ensure that healthcare resources are distributed to those who value their own demand the most. As we know, if there are some mismatches from the equilibrium, maybe somewhere here, or maybe if the price is set somewhere here, if there are any points in between not at the center or not at the equilibrium point, there will be an invisible hand that will drag to the center. It is a typical demand and supply function that we have read in our economics theory. So, accordingly, the values determine.

In the public health system, in particular, the funding level should be set such that it allocates the resources to high value and away from the low value demands. So, especially in the supply curve, which we have said is basically the additional cost of every unit of service being provided. Due to market failure, we want to mention here that the equilibrium quantity that is to be restored by the system may not be defined to be the best. And so, in terms of market failure, basically, the market is not in a position to properly value the entities that are demanded and the suppliers. So, due to market failure in other regions,

society and policymakers consider that the value derived from demand curves for healthcare is satisfactory.



There are three significant reasons why private and societal demands differ from one another. So, the way we emphasize or project the value, the society may not be projecting. So, individual demand and the societal demand for any service might be different depending upon the proper contract in the market. It has to be a competitive structure in the market. But if the market is not functioning very well, it is already conceived to be biased or conceived to be erratic.

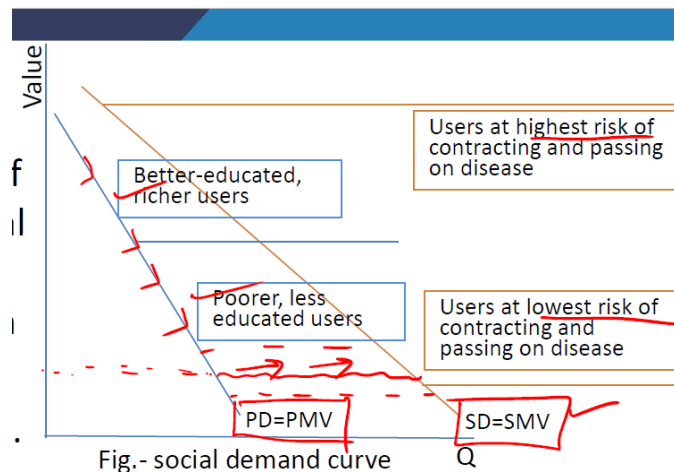
In that case, the valuation of any product or service is not going to be correct. So, we are trying to define why private and societal demands differ. It is again because of the ability to pay as well as a willingness to buy. And in comparison to the demands of poorer people, the demands of richer people are more weighted. In the health sector resource allocation, if society or policymakers believe that demand should be equally weighted, values derived from demand, evidence alone cannot be relied upon.

So, the second one is that, as far as private and social differences in valuation are concerned, another factor that is attributed is a lack of information in terms of ranking that helps in terms of privatizing individual demand against societal demand. So, they could place a high value on interventions that are limited, or the effect is limited or is limited in effectiveness because product claims have misled them. This restricts the extent to which the demand curve can be understood at the person's actual assessment of the available health interventions. So, basically, this roughly discusses that if the information does not reach all the people correctly, then the valuation will be different. The third one is called externalities.

Most of the time, people do not consider benefits when valuing their own benefits like disease and disease transmission with vaccination; it reduces to another one reduced risk of disease transmission received by others. And like in COVID time, there are a number of ways where you might have seen the externalities or the information that is reaching others have hugely inspired others to value the product differently. So, given the perception of

one person that immediately transmits to another one, yes, the information network might work better, but the externalities might be giving a different indicator to value differently, not necessarily the time which we have started with evaluation would be same in period two. So, the value and order demand the use of resources from a social perspective, a social demand curve can be hypothesized, and accordingly, we can define how they are different. So, private demand and social demand functions are different.

In the below graph, the demand structure that we presented is largely called the individual demand function, but we are trying to differentiate private demand from social demand. Here, we are mentioning private demand; here, it is social demand. So, basically, it is the individual addition of all successive demanders and their demand or their marginal valuations that define social demand as being against private demand. It is similar to the context of the market demand curve, which is against the individual demand curve in economics. Social marginal value is also diminishing with the rise in access to any service or quantity except some particular services.



There are some exceptions we used to study in demand theory. Let us consider an example called vaccination in this case. Say vaccination may be for missiles, maybe for BCG, injection, etc. The individual's values of immunizations are likely to be quite low, and the private market demand curve is drawn as in PD. So, whereas society as a whole it is quite essential, for a society it is essential, it will be controlling. Whereas an individual might pursue that somebody has already taken vaccination, it is hardly impacting me. Likewise, in COVID, even if there were a number of restrictions, the lockdown was imposed. Still, people were still not able to follow them strictly. They value the instruction not so seriously. Even people did not consider the COVID-19 vaccines seriously. They had the perception that if somebody had taken it, then it would be highly affecting my body. So, individual valuation is considered to be less viable or less demanding. Hence, the willingness to pay for this product is much less. However, as a society, the planner's point of view or the planner is projecting this to be very good, and hence, society requires more

emphasis to be spent on this particular direction. That will eventually control all individual needs. In short, all individual perceptions are added, and in horizontal addition, we will get for each price contract, which will have higher demand. So, this demand every time is actually projected or estimated for the social demand functions.

Accordingly, when we say individual demand, we define it through the user's perspective as well, who is projecting or presenting the willingness to pay or their payment structure or their demand for different services. Especially when we are citing any service unit, it varies from better-educated persons to less educated persons, and it also varies from richer class to poorer classes because they may not be able to afford the poorer classes section, may not be able to afford the high-end services. Their willingness to pay would be considered to be less. Similarly, at the societal level, so far as ST is concerned or social marginal value is concerned, we usually define users as having the highest risk of contracting and passing on the disease. If it is that, then the valuation will be very high. If it is at the lowest risk, then the valuation will certainly be less.

So, once the vaccination is implied or already effective and some of them already taken, then there is a possibility of reduced risk of disease transmission, and another person will be taking it at a very lower value. Hence, its demand curve is drawn, which is estimated at a lower level than that of the social marginal value. Considering this, I think I have already mentioned that it is dependent on affordability, it is dependent upon education, and whereas in a social context, it depends on the extent it contracts, it depends on the rate at which it diffuses to other people, and also it depends on the risk. So, risk is one of the factors, and that is not the one that we find too relevant for individual valuation. So, I think based on the adjustments for social value from private values, which are likely to increase value, the social demand curve lies to the right of the private demand curve.

Then what do you mean by an adjustment, which I have already started discussing? So, what kind of adjustments are made? Adjustments like a full understanding of the benefits of immunization for the individual, like correcting for imperfect information, if any. If the benefits are fully observed and understood, in that case, adjustments are considered to be faster. The effect of immunization for others whose risks are affected, taking externalities as well and so adjustment for imperfections, adjustment for externalities, removing well-related weights, etc., will be countable enough for the adjustment to take place faster.

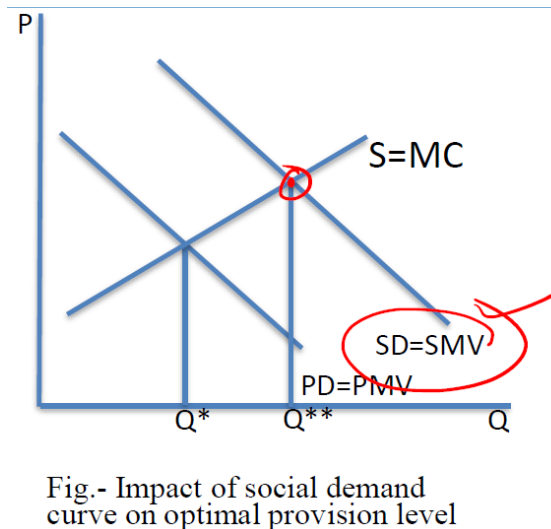
Immunizing individuals at the highest risk of contracting and passing disease will be given the highest value. When the herd attains immunity, the marginal benefit of immunizing the next person is 0. So, this is, in fact, happening in the post-covid period. Instead of being measurable things, social demand curves are usually conceptual-based. Social values cannot be observed and can only be closely related to concepts such as benefits, QALY (Quality-Adjusted Life Years), Disability-Adjusted Life Years, etc., or some of the databases available to get some perception-related measures for different services. Now,

we are going to clarify that for the system to work or function better, funding is required. The system without funding, who funds it, and where it is useful are not discussed at this moment, but funding is most important. It depends upon the marginal valuation and its marginal cost of funding, and hence, we will be emphasizing optimum funding and underfunding. So, funding, what do you mean by funding? It is basically simply the allocation and use of final resources in the health system.

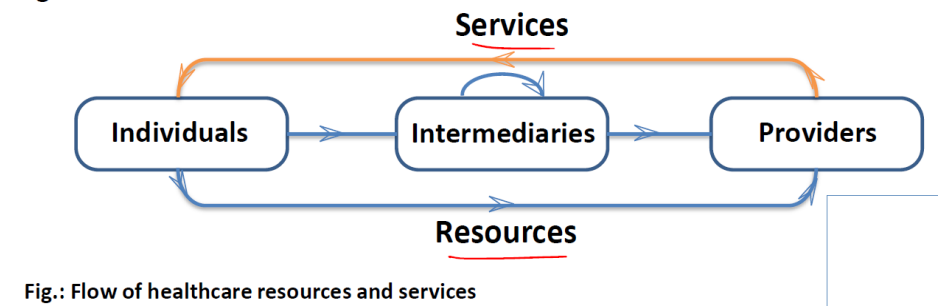
Optimum provision and funding is where the marginal social value of the application of a unit of resource equates with its marginal cost. Wherever they are equalized, we define this as optimum funding. In this figure, we find that in the social demand curve, basically, we have taken a parallel shift for simplicity. The social demand curve lies right to the private demand curve given the marginal cost valuation that is the supply curve; we have the social demand that resulted here is Q^{**} and as against Q^* . So, a higher level of funding must now be defined as optimum, and levels below that are defined as underfunding.

So, any level once we define and above this is called optimum. A higher level of funding: basically, once we have defined this, a higher level of funding must be defined as optimum, but the optimum must be clarified very clearly. So, once this MC and MV are equalized, we usually consider this to be the optimum. However, once it is below this, if it is not attainable, the social marginal value is not attainable. This is basically a demand of society, but your funding is coming short of it.

Therefore, the demand is not possible to be made in that case, which is called underfunding. Let us clarify further. We are differentiating that this health care system receives adequate financial resources to provide high-quality care, ensure access to all, and invest in necessary infrastructure and innovation, which is called optimum funding. However, the healthcare system does not receive sufficient financial resources to meet the growing demand and maintain the quality of care. So, in our typical demand and supply structure, once the equilibrium is not attained, we define it as underfunding. Otherwise, it is called optimum funding.



So, we are discussing the health system through institutional structure and its efficiency. A health system is defined by the relations between users, payers, providers, and regulators. And who are the entities? Largely, they are the individuals and the providers in between the flows of resources or the services that are actually cyclical in nature. The flows might be through resources or services.



The provider provides the services, and the individual provides the resources for which the services could be met. So, it is not just this is so simple. In fact, there are intermediaries and regulators, and there are implementations, but only those are different. Those intermediaries play an important role in the present system in dealing with both entities. So, those intermediaries may be regulators, government, social health insurance funds, regulatory bodies, and others.

There are alternative ways of organizing health systems that have implications for the ownership of health-providing and financing institutions. They are internal governance structures and the flows of resources within and between institutions. Within the system, incentives really work much so far as meeting the individual demand through the providers, or the providers may be defined to be efficient enough, and that efficiency could be through

allocative or technical. What do you mean by allocative efficiency? Basically, when the productive activity has been allocated to those products that consumers value in terms of access to their cost, productive activity has been allocated to those products that consumers value in access to their cost.

Technical efficiency concentrates on using resources efficiently to achieve a specific goal, but how well are resources actually used to produce a given level of output or achieve a specific objective? In the first case, we talked about how distribution matters and how we allocate this to the consumer, and in the second case, we emphasized its productive or efficient use through technical management or approaches. So, incentive really matters. Incentives to pursue efficiency strengthen as institutions become more private as of low-powered incentives or high-powered incentives. It depends on whether a high-powered incentive operates in markets and a low-powered incentive operates in hierarchical institutions like big businesses and government entities.

So, market-based operations are there; they are usually called high-powered incentives. In the government system, we used to have hierarchical systems, and the target of the government was not to distribute its profit because there was no profit, as a word in the government system. Usually, the purpose of the government is an allocative one that largely follows hierarchical incentive schemes. Whereas market-based might derive the best result, that is why it is called high-powered incentive structures. So, incentive within an institutional framework entails qualitative evaluation of the balance of incentives and degree of strength.

Some public sector organizations have well-tuned performance promotion systems with steeply graduated pay structures that attempt to reward achievement financially. These are also made as effective as profit-sharing schemes in private organizations. As I already mentioned, in public organizations, that is really due to some forms of incentive, promotion-based incentive whereas in profit sharing scheme in private organizations is usually followed. In teamwork, it is invariably challenging to align pay with performance. You might have seen some tasks are given to the team. So when the team has resulted in a bigger change, better output, in that case, distributing or giving incentives individually is very difficult.

It has to be treated on average or equally. Both public and private organizations have fixed salaries, poor career structures, and weak promotion incentives. As we all know, incentives lead to harder work, more focused efforts, and improved performance. So, a new way of designing an incentive case is very urgent to derive or define health systems to be efficiently functioning. However, incentives can also be perverse. Not necessarily all incentives are going to be effective.

So, different elements of the structure and design of the healthcare system may result in perverse incentives as well. Paying healthcare providers a fee for service may encourage them to prioritize quantity over quality of care. So, the strength and value of private sector incentives are high if the perfectly competitive model is followed, and so it is a market-based incentive. We have already defined a high-powered incentive structure. Profit-seeking implies a concern with cost minimization. In that case, it is called internal efficiency and seeks to meet consumers' demand where allocative efficiency is discussed. So largely, what is discussed is profit-seeking, if any is there that is largely due to internal efficiency-based structures where cost-minimizing steps are taken, and another efficiency is also made to derive more demand, that is, through allocative efficiency.

In our chapter on healthcare efficiency, you will understand the details of efficiency. And I think we have already covered this in our chapter. If you check our complete units, you will find in our chapter, unit number 10, a dedicated section called health efficiency, where we will be discussing the concept of efficiency, Data Envelopment Analysis, DEAP software, which is open source and with certain examples and we will also clarify technical efficiency, internal efficiency and other. So, more market exposure, as we already said, will be more rewarding in terms of better valuation or efficiency. So however, market imperfection leads to more complex situations as we know that if the competitive structure is there, it is always good to be efficient, whereas, in imperfection, the incentive structures are considered to be very complex.

A mix of incentives for various sorts of transactions in various sectors of the health system is advised and needs to be assessed in relation to the specific characteristics of those transactions. Another direction in terms of this is the adequacy of institutional arrangement, which is sometimes called transaction cost economics. This is in addition to the price of goods and services. Transaction costs also include searching for suppliers, negotiating contracts, keeping track of performance, and enforcing agreements like in Ayushman Bharat, in which stakeholders fix incentives and prices for various tests, medicines, and medical procedures.

That is very rigid. It is also helpful to apply the agency ideas to better understand the incentives in a given set of arrangements. This aims to gain insights by examining the interaction between the principal and the agent. who is considered to be the owner, whereas the agent or the manager we used to read the principal-agent problem and in the valuation of any services, but largely the owners has little idea about the functioning though most of the valuations are observed by agent. But so far as the sharing of the incentives is concerned, agents and the share are considered to be lesser, which is very negligible. Even in private healthcare structures as well, incentives are biased towards the operant of the functioning, especially the owner or they are the principals.

So, when the incentives are not clearly defined, the efficiency is considered to be questionable. So, actually, managers are compromised or sometimes at the prey of non-distribution of the incentives. So that is typically the problem of the principal-agent problem. So similarly, I think I have already discussed this largely, but in the public, which chooses policymakers especially, the public is the ultimate principle in the public sector. In applying a qualitative agency analysis, there are a number of questions that are helpful to ask in a given situation.

So, especially, the question is, where are the agency relationships in the system? There are multiple relationships that can be analyzed from different standpoints under insurance, we usually consider the agent to be the enrollee, and the insurance company wants the enrollee to avoid the risk on its behalf. Hence, however, there are others in which the insurance company is the agent of the enrollee and, most notably, in carrying risk. So agency relationships are often but not always reflected in financial flows to the extent where money is transferred, and there is an associated expectation that goods and services will be provided according to the direction of the payer. So, the payer is not incentivizing enough to the enrollee. Hence, the effective reach or the acceptability of the buyers for the scheme may not be perfect.

So money need not be involved. However, regulatory transactions also matter so far as incentive structures are concerned in that case. Another question is: what are the information asymmetries in the relationship, and where are the common uncertainties? The doctor-patient relationship is even, in this case, an agent-principal relationship; the principal is our patient, and the doctor is more knowledgeable than the patient regarding the best course of treatment for the patient's condition. However, there are common uncertainties about how well any course of treatment will work. Therefore, there will be huge doubts about the system because of uncertainties. So, it is not just the principal-agent problem; it is also coupled with information uncertainties.

Due to these, the patient is unable to determine if the doctor behaved in their best interest even after the fact. So we have discussed the incentive structure, we have discussed private and public licenses so far as the health system is concerned, and we have also discussed the evaluation of the health services through marginal social value, hence, we defined the concept called optimum funding level and underfunding level. So these are always essential, and to have a better efficient health system, we should have better incentive schemes that must address the optimum funding level as well as optimum social valuation for the demand, etc. In addition to that, incentive schemes are always catalysts for performance, and that is not just possible unless we do not define not segregate public versus private, and the principal-agent problem also has to be dealt with. To address these answers and to understand these questions or discussions, we will set some questions at the end, and I am sure you can answer these readings you can also follow further.

We have marked two important readings with page numbers and chapters written from the book. I think these are very essential, and in our next lecture, we will be discussing theory and evidence around options for financing a healthcare system. We will also discuss their strength and weaknesses, especially emphasizing financing the healthcare system through taxes or through social health insurance schemes. With this, it is time to close. Thank you.