Health Economics

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Week – 01

Lecture 05- Arrow's Perspective of Healthcare

Welcome friends once again to our NPTEL MOOC module on Health Economics. This is indeed our introductory week. We have already started discussing some of the lectures on the economics of health and healthcare, why health is an important economic good, and how it differs from other goods. However, this is our last lecture in the introduction section. Here, we are trying our best to give you a perspective on healthcare by understanding Arrow's conceptions. Therefore, our lecture is entitled 'Arrow's perspective on healthcare'.

Here, we will clarify how healthcare is a special economic good. What really makes healthcare a special economic good?

And this can be better understood if we cite the works of Arrow. He is considered the pioneer in the social choice field, especially when referring to the context of healthcare. We will also be referring all those details in our slides as we will discuss.

Beginning with what we did in the previous lectures, especially in the previous two lectures, we clarified health as an economic good, why it is called economic good, and what its differences are from non-economic good. We also differentiated the economics of health and the economics of healthcare. Usually, the basic understanding is on healthcare, but that does not necessarily complete the entire discussion.

Health is not always a subset of healthcare. It might be addressing different aspects and perspectives. Sometimes, it addresses health in the aggregate sense; sometimes, we aim to clarify the specific programs that are indeed focused enough, and that is part of the economics of health. We have clarified that and learned that health economics is more complex than it seems since it has various dimensions. And there are risk components attached to the healthcare as it has deep-rooted dimensions.

This lecture will focus on what makes health and healthcare different from other economic goods. What is it that makes healthcare special? As I already mentioned, we will look to understand Arrow's perspective on the healthcare industry to answer the question. In our first lecture, I mentioned that Arrow is a pioneer economist. He is a top-most economist who also paid great importance to healthcare. His contribution is focusing on the healthcare industry compared to other economic industries. The lecture will act as a base for our further lectures, which we have covered in different sections in other units and weeks of our module. If you have started exploring some of the concepts of Arrow or Debreu's theory,

you may not just understand everything now. You may have to read our other specific lectures, like the one on insurance. Further, I will also try to relate behavioural economics, where you will clarify things better.

So, who is Arrow? We are referring to his entire period from 1921 to 2017 and his famous pioneering work due to his PhD thesis. At around 30 years of age, he submitted the PhD thesis, and I will also clarify what that is all about.

So, Arrow was a theoretical economist with extremely broad and diverse interests. His contributions range beyond the boundaries of economics and include mathematical programming; its simplified versions are also presented in different books. His interests do not just cover economic issues; they also include political and social philosophy. Apart from being one of the pioneers of health economics, his two major contributions include the impossibility theorem (first work). This impossibility theorem was understood and became popular after his thesis was presented and submitted. It is referred to as the year 1951.

His second famous work is the mathematical proof of the existence of general equilibrium. Along with Arrow, Debreu is also attributed to it. It was published in the year 1954. We usually study general equilibrium analysis in the later part of the advanced sections of our microeconomics. So, these two are considered his best contributions, i.e., the existence of general equilibrium and impossibility theorem. We will clarify all such details in other chapters of our module. We have different chapters in every section, as I probably told you when we discussed everything during our introduction lecture, including which section comes at what time and at which unit.

For example, we will discuss 'equity and health' in one of the units, unit number 4. So, unit number 4 has the title, 'Defining equity and equity in health'. Even somewhere, we will discuss Behavioural health economics. We will also emphasise some extended versions of those theories in terms of demand and supply perspective, especially on demand issues. And we also evaluate those aspects. I think you will learn more in later lectures. You might have understood from our introductory lecture.

So, what is Arrow's perspective on health economics? It is similar to other major contributions, but in this case, like the other two major contributions that we have just discussed, the lack of a complete market has also been a central theme in healthcare economics. Whenever we refer to market conditions, do you think it is often the case that some market features are imperfect? These incomplete market features lead to some kind of complexity in the evaluation of healthcare, or that is, in the discourses of the economics of healthcare.

Arrow's 1963 paper, titled 'Uncertainty and welfare economics of medical care', is a foundational work in health economics. He has also explored how healthcare differs from typical goods and services. Based on his research, he concluded that healthcare's unique traits hold a special position in economic analysis.

Now we will discuss 'The problems in the healthcare industry as a differentia from welfare economics'. How far is this different from that of the welfare economics? Arrow broadly highlights three healthcare industry-specific problems that are clarifying these two discussions. Arrow highlights that these three healthcare industry-specific problems are leading to market failure. Here, the simple meaning of market failure is that, given the market context, different market features lead to some form of injustice or bias towards some of the stakeholders. We will clarify this in our respective sections. At this moment, I am just trying my best to give you directions related to the healthcare industry as opposed to welfare economic differences and problems.

So, the three problems are- information gap, moral hazard and adverse election. So, here is Arrow's perspective on the first problem, i.e., the information gap. Here, the problem lies with how information works and how it is not clearly reaching the stakeholders. With reference to Arrow's work, the problem of the information gap is due to the fact that information possessed by the physician is necessarily much greater than that of the patient or at least so both parties believe it. Further, both parties are aware of this informational inequality, which colours their relationship.

So, as a result of this problem of the information gap, which we have started discussing, individuals do not know the quality of care they will receive from the doctors, especially when specialists are involved. It is important to find good doctors since incompetent doctors can cost you your life. However, finding good doctors is time-consuming and difficult for consumers. So, in one way, it is expensive. It may create huge disturbances in another way, where through information, when you find good doctors, that is creating indirect cost in terms of time consumption, and it's also indirectly expensive.

So, Arrow suggests a solution to this problem of the information gap. Arrow perceives the entry barrier as the sole method to mitigate uncertainty. In this case, the entry barrier really matters. One of the arguments that Arrow proposed (as we mentioned) is that the licensing prerequisite ensures that physicians have received medical training and possess medical competence. So, suppose licensing is guaranteed, made as a prerequisite, or mandatory. In that case, the patients will have a strong confidence in the medical system, and hence, a regulator can do it better. If you just leave it to the market, the market may not be actually guaranteeing this perfection as in the licensing prerequisites. So, it is again linked to the market. The market is not necessarily 100 percent ensuring the best licensing structure. So, Arrow mentioned very clearly that licensing prerequisites are necessary to lessen the information gap, especially at the entry level.

Unlike Milton Friedman (we are also referring to the works of Friedman on licensing requirements), who regarded this as a means to establish a government-sanctioned monopoly leading to reduced supply and higher prices. So, yes! When we guarantee the licensing mechanism, it is considered valid in the international context that the government eventually becomes the monopolist. And when that is somewhere guaranteed, yes, that

might compromise the supply and also eventually raise the price level of the consultations or care.

Further, Friedman believed that market competition itself would eliminate incompetent doctors. So, in contrast to Arrow's work (that we just mentioned), Friedman argued that if we leave it to the government in terms of licensing, that might be monopolised and have negative implications. However, leaving just to the market may guarantee the elimination of incompetent doctors if patients are not visiting those doctors. So, in that case, the market may correct on its own. But it depends upon which kind of consumers or patients you have, how the income flows, and what the market is all about. If the market started with a stable situation, then Friedman's ideas of eliminating the erratic component in the healthcare system are fine. But Arrow specifically mentioned and considered the unregulated medical market akin to the risky game of some examples we cite- Russian Roulette (highlighted in the picture), that does not serve society's interest. As I mentioned, society's interests are multi-leveled and very complex, so the starting assumption is important.

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In reality, the assumptions are not necessarily present. Hence, the unregulated medical market may be very risky, similar to the famous game of Russian Roulette. If you search on YouTube, you will find several videos on this Russian Roulette game. Here, there is only one bullet in the revolver, and it is not guaranteed that in which shot the specific bullet will affect another person. Therefore, the expectations of managing that risk are very high. Explaining through the example, Arrow highlighted that in a societal context, a market-based approach may not be right. So, licensing requirements are considered to be good.

The second problem listed among the three healthcare industry-specific problems Arrow mentioned is the moral hazard problem. Here, the behavioural aspect is largely emphasised. The morality of the person is emphasised. It might be the case that the person considered for insurance may interpret differently when the person is in a very safe zone. This used to be the case in the healthcare market, especially in the insurance market. In the lecture about insurance, we will also explain in detail, with its detailed diagram, how the demand curve is shifting, and the final contracts in the society or to the buyers are considered to be very less paying, or the net loss is considered very high. We will discuss this in our respective chapter, unit number 5.

So, Arrow's 1970 work introduced the concept of moral hazard in the healthcare market. Moral hazard suggests that insurance alters individual behaviour by reducing concerns about the consequences of their actions. Here we have cited another example: when

somebody is insured, like you have been given a free health checkup certificate, maybe through the Ayushman Bharat scheme. If that card is with you. Even if it is a minor disease or minor ailment, you will still feel that you must have a test since there is no specific burden. Or, at the point of disease treatment, you are not supposed to pay as you already have a payment structure with a pretty low pretty premium, which is borne largely by the government. In this case, there might be overburden and overuse of these resources. That is only due to morality or moral conditions, and that could have been corrected at home only. A person's morality may lead to over-dependence on the hospitals, leading to supply-side constraints. Even if supply-side constraints are not there, overdependence on healthcare is still an issue raised through moral hazards.

Another recent example we will be happy to highlight is called the subprime crisis issue. Suppose we have insured deposits at the bank. However, we never care that the banks may not utilise the funds in the best way or that the market may not guarantee the best return based on where the bank utilises funds. However, insured money increases the likelihood of banks engaging in risk lending. In other words, the bank might utilise all our funds, and we are less concerned about the bank's utilisation of our funds. This might eventually end with risky lending issues, resulting in economic challenges. Recent evidence can be the subprime crisis, which lasted from 2007 to 2010. The most tremor was felt in 2008-09.

If you remember, the prime value of the assets has decreased significantly in US markets, especially in real estate. Real estate, considered the best-invested sector, is where over-loans are issued. So, overloans were issued by the banks, utilising the insured deposits submitted by the individuals and considered insured. It was because of the banks' over-guaranteeing with the assumption that the bank was ensuring everything. This leads to the loan seekers' misuse of funds. So, that has led to some forms of collapse, as evidenced.

However, the most important example we used to give is moral hazard in the healthcare sector. Even Arrow's work also emphasised the behavioural perspective related to health care. So, Arrow asserted that in the case of health care, moral hazard can be such that individuals with insurance may engage in riskier behaviours since they expect their medical expenses to be covered, which I already mentioned. As a result of this moral hazard problem in health care, a phenomenon would be created that would lead to an increased demand for health services and higher health care spending. So, moral hazard leads to what? Spending increases, and there are indirect costs as well. Though insurance premiums cover some costs, large demand can not be accommodated.

Arrow suggested a solution to deal with the moral hazard in health care. When we say a fully insured individual, we mean they pay very minimum or negligible payment as a premium or one-time payment is given. In that case, co-insurance can be a solution to avoid moral hazard, as proposed by Arrow. Co-insurance means an individual pays a significant portion of their health care cost and might even be charged in different phases. Co-insurance encourages less risky behaviour, resulting in fewer but real compensation demands for health issues and decreasing national healthcare expenditures. Many research

papers and authors have already evaluated the moral hazard problem as a cause for higher expenditure. For Co-payment, you can also take a research problem in your work: how far co-payment or co-insurance is correcting moral hazard problems.

We have discussed the information gap and moral hazard. Now, the third one here is called the adverse selection issue. These three issues are all connected. Adverse selection usually results in market failure, as explained in different microeconomics books. In particular, I will refer to Hall-Varian's introductory microeconomics and advanced microeconomics book (called microeconomics analysis). You may read the chapter on adverse selection from these books. Adverse selection is a result of the information gap, and it is also a result of moral hazard issues, leading to market failure problems. This arises because of the information gap between the demander and supplier, as individuals or patients possess more information about their health than insurers. So, what is the context here? When the individual patient possesses more information than the insurer, insurers usually set a premium based on the average calculation or evaluation method. The resulting amount is imposed as an amount for premium.

However, in reality, individuals are not the same. Some very clever individuals can easily divert the insurer's attention. Basically, I am referring to the high-risk individuals who are motivated to conceal health problems to avoid increased premiums. If insurers try to acquire information or capture it from all the individuals, it will be very expensive for the insurer. Therefore, insurers follow an average method. And usually, average risk is considered the method for calculating premiums.

High-risk individuals who are about to consult the doctors will prefer to take insurance premium, but they conceal information when buying the scheme. So, the premium they are paying is relatively lesser. In a society like India or even in the Indian context, the low-risk individuals are more in percentages, and they hardly opt for purchasing insurance policies. So, what really happens? In that case, the payment they make (the low-risk individuals) or the number of insurance they are opting for are much less. So, what does that mean?

In this case, the number of selling as an insurance scheme or the insurer cannot be able to market hugely. Especially suppose premiums are set based on average risk (which I already mentioned). In that case, high-risk groups buy more insurance, and low-risk groups buy little or no insurance, leading to losses for the insurers. So, this is what we wanted to mention, and this is largely due to the information gaps with the insurer. To overcome this kind of loss, the company will raise rates (rates of the premium), again resulting in more low-risk individuals avoiding insurance. If they simply increase the rates, they will compromise the number of subscribers.

So, Arrow suggested a solution to this problem of adverse selection. He proposed that a single-pair system can resolve the adverse selection problem. So, what is a single-pair? Is it the individual? Or is it the regulator? In a single-pair system, everyone is covered by one health insurance plan (all are covered), and nobody is going to be differentiated from

treatment or treated differently. Hence, there is no advantage to hiding information by the individual while purchasing insurance policies. So this eliminates concerns about low-risk individuals leaving the system and the escalating cost of insuring people. So, this problem can be easily addressed by a single-pair system.

Such examples have also been mentioned. The UK especially has the National Health Service (NHS) scheme. For Australia and Canada, it is Medicare and for Taiwan, it is National Health Insurance. So, these are single-pair solution-based models, and Arrow already proposed them long ago. As I already mentioned, each of these problems will be discussed in our specific unit.

Regarding the special characteristics of the healthcare market, Arrow argued that the fundamental feature of medical or healthcare is uncertainty, which has led to information gaps, moral hazards, and even the problems of adverse selection.

He stated that distinct economic challenges in healthcare are a response to dealing with this uncertainty. Some of Mushkin's works are very relevant. Even Arrow follows the works of Mushkin. Arrow highlights how uncertainty shapes the special characteristics of the healthcare market into five parts. Emphasising the 'nature of demand', 'expected behaviour of physicians', then 'product uncertainty', 'supply conditions' and 'pricing practices'. So, in these five directions, Arrow highlights how uncertainty shapes the special characteristics of the healthcare market.

Why does healthcare need special attention? So, this is largely explained by these five important aspects. So, we are now unfolding the discussion of these five aspects. I am not discussing between the lines. I may leave you to read some of the points. The first difference in the nature of demand is that while health is considered an economic good, it is considered special. Healthcare and health specifically are irregular and unpredictable in themselves. Health demand is not like other economic goods.

And demand for medical services often involves a significant risk to proportional integrity. Similarly, the risk includes the possibility of death and substantial impairment of normal functioning. One prominent concern is the potential for a significant loss or decrease in earning capacity. Once that is damaged, it has a perennial impact that leads to a generational loss, possibly leading to a loss of earning capacity. While risks are not exclusive to medical care, however necessities like food can be ensured by adequate income, unlike the guarantee against illness. Illness represents not just a risk but also carries inherent costs aside from medical care expenses.

Another aspect we need to mention at this moment is called 'expected behaviour of physician'. So, that really matters. The expected behaviour of medical care providers greatly differs from that of typical businessman. Physicians are subject to strict ethical restrictions and also go by the priority. So, medical professionals are expected to prioritise customer welfare over self-interest. This is really different from the normal products sold in the

market by the salesman. And they used to provide continuous advice and treatment. And physicians are supposed to be very active in providing continuous advice and should be free from self-interest. Another aspect of these physicians' behaviour is that they should be committed enough to convey the best and right information to individuals or patients.

Again, a key distinction is attached here: especially in health, the behaviour includes the absence of advertising and price competition among physicians. But nowadays, products are rolled, and even healthcare products are rolled for advertising and price competition. But here, we are not referring to healthcare but health and how it differentiates from other products. Providing non-profit hospitals over for-profit ones suggests a preference against profit motives in healthcare supply.

So, relating to physicians' behaviour, Arrow advocated certain research gaps that are to be quoted here. A needed piece of research can be a study of the exact nature of the variations of medical care received and medical care paid for as income rises. This research might still have potential benefits in understanding physician behaviour. I think you can easily understand another feature- 'product uncertainty'- and realise that health is a special economic good. Uncertainty about the quality of medical care is exceptionally high compared to other commodities. Predicting recovery from disease is as uncertain as predicting disease occurrence. So, unlike most commodities that allow learning from experience, several illness cases do not offer luxury due to inexperience. The level of uncertainty in terms of utility variation is much greater in several medical cases than in infrequent expenses like housing and cars. This uncertainty in medical care indeed exhibits a unique characteristic. It significantly differs between patients and physicians. The physicians have really complex information, which is usually absent in the normal commodities and treatment, especially complications related to treatment consequences than the patients and both parties are aware of this information gap.

So other aspects I think I will suggest you to read. Another point is called 'supply conditions.' The supply of a commodity depends on the net return. Competitive theory typically dictates that supply depends on the net returns compared to alternative resource allocation. However, this competitive market deviates significantly in the context of medical care. Specifically, we are referring to licensing restrictions that exist in the medical profession, limiting entry and increasing healthcare costs, unlike typical competitive markets. The restrictions on entry through licensing are not unique to medicines and extend to various other professions.

Another noteworthy aspect is the high cost of medical education today, which in many places are primarily subsidised and do not proportionally burden students. Especially in the Indian case, it is AIIMS. AIIMS is highly subsidised and does not create a burden since it is not rolled in as per the market structure. Social non-market forces are also important. Whether those non-market forces are public or private, they strongly influence both the quality and quantity of healthcare supply. Quality control measures such as licensing laws and medical school standards constrain this diversity of medical care offerings etc.

Physicians maintain a central role in the healthcare segment despite the potential for substitutions.

The last one discusses pricing conditions. The medical profession is known for its unique pricing practices. Extensive income-based price discrimination is one type. Another type is the historical preference for free service. When we say extensive income-based price discrimination, it includes providing free or reduced-cost services for indigent patients, whereas the historical preference for fee service is one where patients are billed for each specific service provided to them by the healthcare providers. This approach opposes other alternatives, like prepayments such as health insurance plans. These attitudes distinguish the medical profession from business practices. The differences in pricing practices have implications for competition and price flexibility. While price competition is often discouraged among physicians, the apparent rigidity of prices in healthcare may not fully represent the flexibility that exists, even though ethical considerations impact price adjustment.

So, we have discussed all sorts of directions to clarify errors, implications, and perspectives on healthcare. Most healthcare systems are complex, as we know, and the consumers' and healthcare providers' behaviour is very different from the competitive market structure for any other commodity. This has two implications that we have discussed already.

But in conclusion, we are discussing these two implications again. One is on economic analysis; another is on reliance on unregulated private markets. When we discuss on the economic analysis, we have already emphasised the errors of perspective. This requires a complete thorough theoretical knowledge. Secondly, the implications of the healthcare providers, whether by government or competitive forces, are that reliance on unregulated markets for medical care is unlikely to produce socially optimal outcomes, and Arrow clearly defined and mentioned it. So, government intervention or involvement in finance and healthcare provision is common. The important reason for this intervention is the inherent uncertainty surrounding health and healthcare.

So, in short, Arrow noted specific or few characteristics of consumers and the provider's behaviour. For consumers, he pointed out that patients do not behave in the same way as consumers. They cannot test the product before consuming it. Similarly, consumers or patients know considerably less than sellers and place trust in the care provider. So, in that context, we have already discussed three important problems which led to market failure. We discussed about the information gap, moral hazard issues and also we discussed adverse selection. In a more general sense, interdependency extends to people caring about health of others and also solves many problems. So, I think we have already discussed the consumer side.

For the providers' side, Arrow pointed out that doctors do not behave in the same way as firms. We have also differentiated how other products differ from healthcare as an economic product or good. Especially, their entry into the industry is restricted by medical licensing regulations.

Another point we discussed about advertising related issue is how advertising is not promoted, advice is so relevant, ethical aspects are very important, and self-interest is not suggested or attached in this context. Treatment is or at least is claimed to be dictated by clinical need, not by the financial interests of the providers. Social and ethical factors, which I already mentioned, are very important in this context. Doctors sometimes charge different fees to differentiate people based on high fees to high-income people and low fees to low-income people with low-income category, and sometimes even no charge at all to the very few people, which is unlike at all in normal market conditions.

So, these are all we have summarised. We have also concluded some of the views from the Arrow. I think these are very relevant for questions and answers.

What is there in the next lecture? In the next lecture, we will be discussing utility and health. Through the introductory week lectures, I hope you understand the logic of health as an economic good or health economics in particular. So, in the following lecture, we will be discussing largely on how utility or the state of health is defined or health state dependence, etc., in detail. So, looking forward to your presence. You can easily apply these topics for your research as well. With this, I think we can stop here. In between, you can go through the readings. We have highlighted (in bold) two references we have referred to most. Others are also relevant for your thorough reading.
Even these books are going to be useful in a next lecture. So, I think I should stop here. Thank you.