Health Economics

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Week – 01

Lecture 02- Concepts and Terminologies in Health Economics

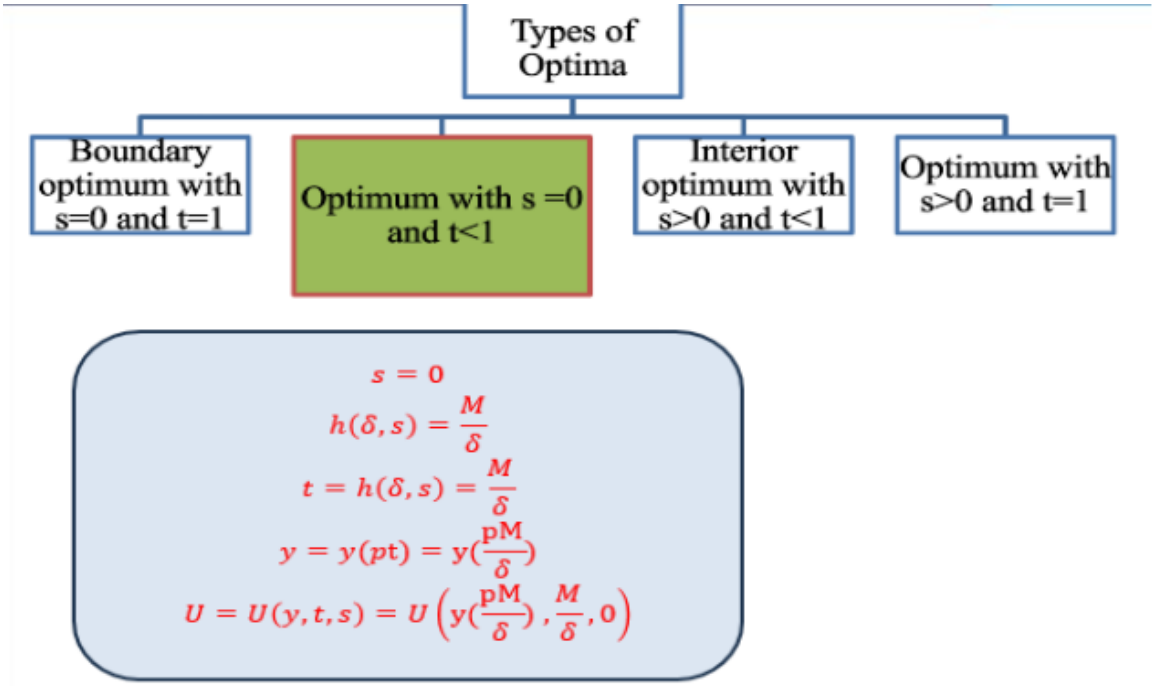
Welcome to our course on Health Economics as part of the NPTEL MOOC program, which is the most important program of the Ministry of Education through the NPTEL. So, in this lecture, we are clarifying the fundamental concepts or terminologies used in health economics. Hence, we will discuss what we did in our entire 12-week module. And I have already introduced you to the efficacy or the best benefits- for the professionals, for the students, for the healthcare professionals in particular and also those who are heading for a certificate and those who want to go for getting projects- sponsor projects, consultancy projects. The entire module is indeed going to be useful. Some of the weeks are very interesting and highly applied, like health efficiency and program evaluation or the health evaluation, not the program in particular. We did not take the name of program in our module but policies evaluation, and in particular we discuss as economic evaluation of the health policies. Those chapters are very essential.

Some other chapters also give you directions for understanding the datasets. Micro and macro and tools and techniques to deal with these data, to analyse or to get a research project that can be presented and derived as a policy paper. So, throughout the process, we have tried to focus on different health economics concepts and applications. Hence, in this particular lecture, I will give you the key health economics concepts. Health economics involves various stakeholders dealing with their actions; since they are conflicting, a solution is required.

So, although most of the concepts and terminologies used in the lecture are dealt in their respective unit in itself (there they are dealt in detail), but at this moment I will give you those in a nutshell, so that you might have interest to read further. And I am sure that from this you can also think of whether that particular lecture can be attended and rechecked again for your own learning. Like I am just giving you what we have done it. I am just showing it, I will explain you what I have done it here and I will come back again. So, in some lectures, we discuss the possible solutions to maximise the utility when a person is targeted with certain factors such as in their consumption model.

In our typical demand theory, we deal with consumer goods that are exposed to the consumer. But now the same person is not just a consumer; he is also carrying a certain

health state. Hence, the consumption basket depends on the level of health the person is carrying.



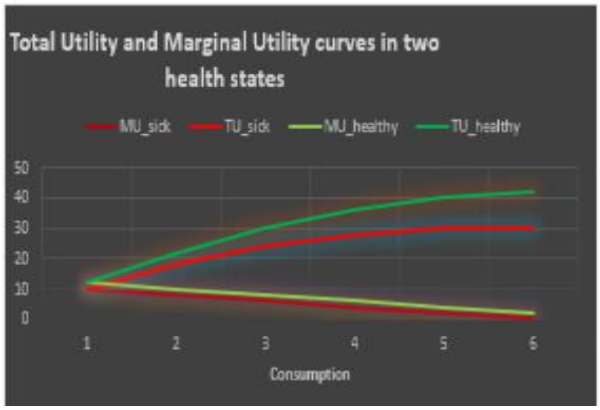
I am not going to clarify what is this optimum with $S = 0$ at this moment. I am clarifying it in their respective unit; you will find somewhere in our week. You will particularly find these things in our demand in healthcare and in supply in healthcare, especially in unit number 3, unit number 2 etcetera, you will find it in detail. So, I will suggest you to read and get the details. We have tried to derive each of these directions and explain them.

Just for your sake of interest, I am mentioning that- when a person is heading for a consumption basket, his portion is actually juxtaposed with the carrying capacity of resource allocation. So, what is that carrying capacity? Whether a person can be able to carry forward or not, it depends upon his health level. So, health level is another commodity that is part of the consumption basket. So, we try to optimise- at what level the consumer can optimise it. And again, in typical microeconomic theory, we use to explain the 'constant optimisation' through the constant linear optimisation or linear constant beta optimisation.

But at this moment, in this module, we have also tried to discuss non-constant optimisation as well. We also try to talk about when the constant function is not linear, where we are supposed to use the Kuhn-Tucker theorem. So, the Kuhn-Tucker theorem is also not just a Lagrangian multiplier, yes, we have also used initially then we extended to the Kuhn-Tucker applications as well. We discuss the boundary optimum and entry optimum, etc., at our best. I am sure that it will expand your thinking.

In addition to that, we initially started explaining what the health state is.

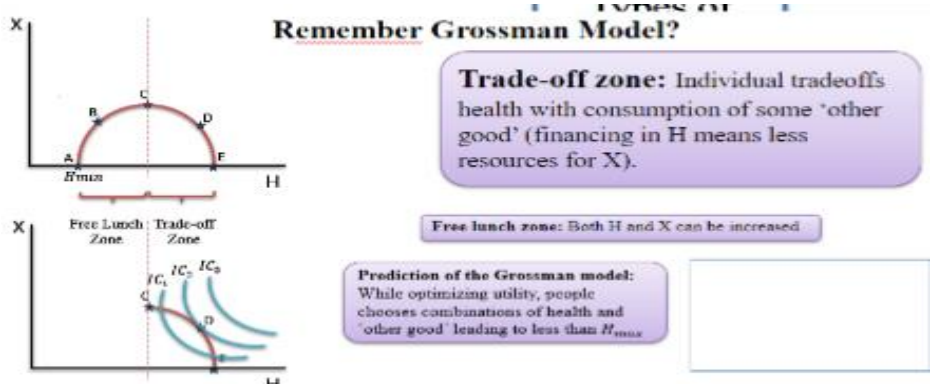
Negative health state dependence: An example



Unit	MU_sick	TU_sick	MU_healthy	TU_healthy
1	10	10	12	12
2	8	18	10	22
3	6	24	8	30
4	4	28	6	36
5	2	30	4	40
6	0	30	2	42

And it depends upon their marginal utility and total utility. But what we perceive? - the marginal utilities and the difference in the society are based on the health state and how the next level of demand is generated. That is why we try to emphasise the negative health state dependence somewhere. I am sure that these are going to be your doubts. So, hence, please go through that peek, we will clarify.

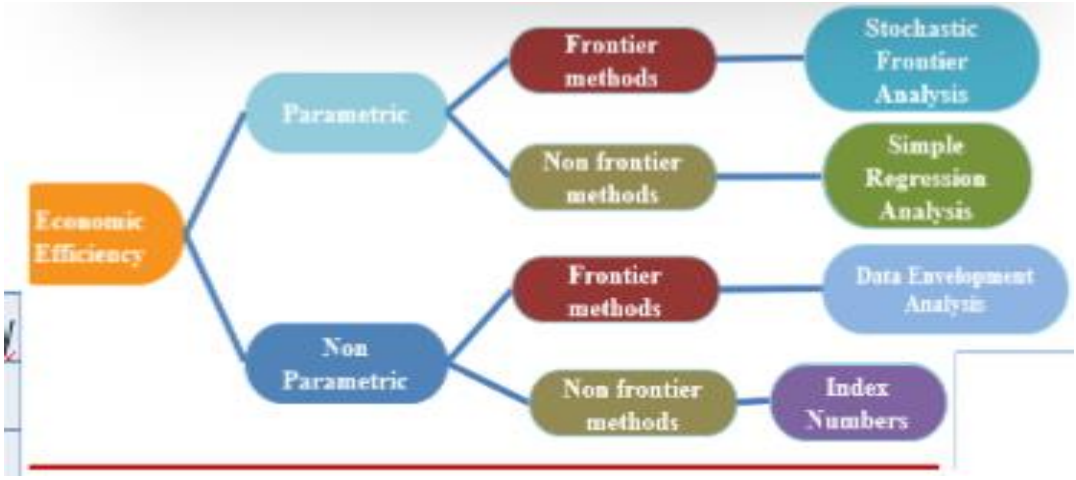
To explain you these things, we took the help of the Grossman model. That is why I have just taken a snapshot of my respective lecture graphs, where we are trying to discuss trade-offs between health and consumption.



We try to explain the idea of Grossman's on human capital formation through the health as an investment or human capital. And interestingly, the production possibility frontier we derive (in general) is not just a concave structure. It should not just start with an optimum point. It might start from its H-minimum (health minimum) level and, may end with a certain extreme point where the person is ending his/her life. And hence, this person which is highlighted is mentioned over here. And where we tried to, we have given our direction to explain you- the maximum possible solution for health economics. So, you will find in our respective chapter, I am sure it will be helpful.

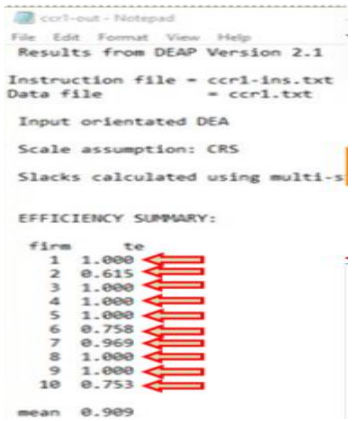
Similarly, we have taken a leaf further in understanding the health systems in detail. Health systems, including the marginal social welfare etc., how are the persons actually exceeding

their consumption or taking more such type of over consumption? How it is creating some forms of threat? Hence, a health system might not function well. So, however, a dedicated chapter is on health system. Economics of health system- we discuss about their tax and social health insurance mechanism. We discuss private financing mechanism and cited the examples of different health systems in the world. Therefore, we have explained and examined their efficiency, productivity, and efficiency parameters.

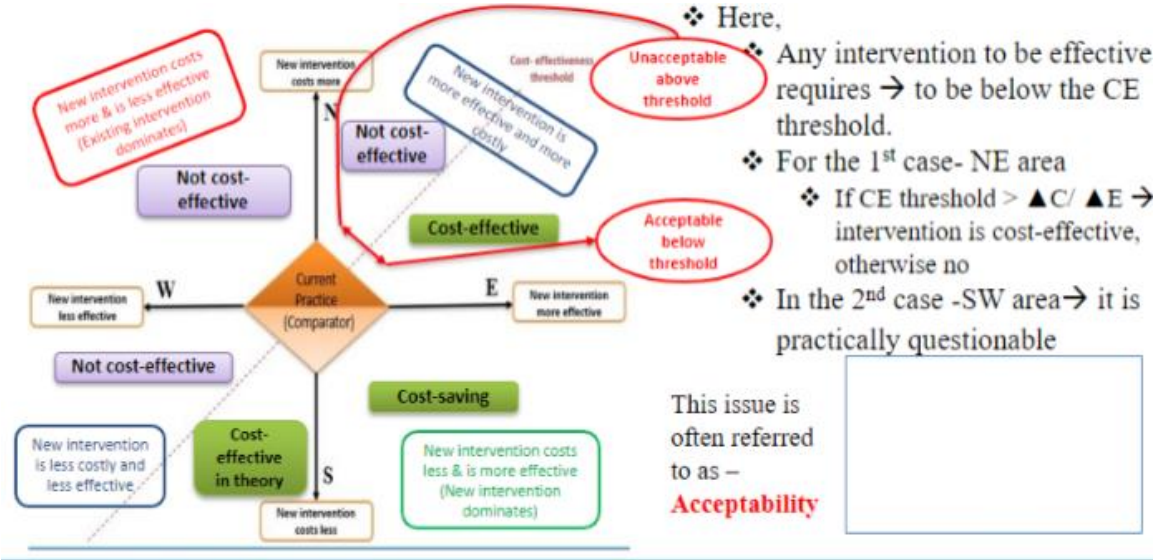


So, we have taken the help of parametric and non-parametric tools. We have emphasised the non-parametric tools in detail using the data envelopment analysis, we have also used the DEAP software. DEAP is a free software, we have guided in the respective chapter. If you remember, you might have read regression as well, if you have not read, or if you have not read even microeconomics, it is still fine. I think we have made this module available to every learner. And, especially in parametric, it takes the help of a distribution. We try to explain the regression tools, but not in detail, but we have emphasised in that chapter on data and envelopment analysis. We also guided you- how to reach to the level and how to reach to explain stochastic frontier analysis as well, though we have not discussed in detail.

And so far as health efficiency is concerned, as I told you, we got the help of the DEAP software, and this is how it looked-



And I am not clarifying everything; these are all explained in our later recordings where we discuss about the CRS based model, BCC input and output model. All possible starting explanations, including their slacks and targets, how to optimise, how to reach efficiency indicators and how to develop index based on the best indicators, are also discussed in other chapters. And so far as the economic evaluation is concerned, we have tried our best to make you understand the cost-saving techniques. We attempted to discuss the possible tools, cost benefit analysis, cost utility analysis and even various tools of economic evaluations are discussed in detail, especially in week number 8 and week number 9.



Like you can read through this diagram, there are situations which is clarifying- whether we should go for more cost effective one or less effective model? or we go for any new intervention or not? whether how far it is useful?

So, these are all the glimpse of our different chapters. However, we have only captured 4-5 important snapshots. There are so many, since we have around 60 lectures. So, let us explain some of the concept for your reading and for your understanding to start with and this will subsequently help you to take off our different slides correctly. We have used jargons and broadly let us divide them into basic economic jargon and health economics jargon.

Choices in basic- refers to "the decisions made by individuals, firms, government on what needs and what wants to satisfy and what products and services to produce or provide and choices are inevitable due to the scarcity of resources". So, again, scarcity is attached with the availability of limited resources and society's needs, wants, since are unlimited, hence the decision making is very important. And the role of market, where market is a physical or virtual space, where buyers and sellers transact their contracts and exchange the goods, services and assets to find out the best value. Regarding disposable income as a concept, we have also used to explain how far this is creating a threat to the individual as a burden or maybe creating some catastrophes on them and so far as resource allocation as per the

provider is concerned, how far they are actually allocating the best including the taxes and how far they are actually generating for the social welfare etcetera are also linked.

And so far as the basic economics jargon are concerned from the consumption side. Demand is presented. Demand, utility, utility functions, and just half a minute I am going to take it to explain all these things. We sometimes are confused with demand, wants, utility, and satisfaction. These are largely interchangeably used. However, when demand is concerned- it presents the quality of goods and services that consumers are willing to and able to purchase at various prices during specific period. And in economics, sometimes we use, or call quantity demanded when- quantity demanded when we are restricting to a particular commodity when we are restricting to X and its respective price of X.

So, we will find out such things in our module, but not in detail because they are very basics. And utility is basically a measure of satisfaction and the utility function we have presented is a function of combination of goods and services. Indifference curve- where in microeconomics, we use to explain a set of combination of commodities presented in a graphical space, where it derives in equal satisfaction to the consumer with different combination of two goods. And when the combinations derive equal satisfaction out of all those combinations which is indeed the best combination is, where it lies with the decision making. Hence, it is important, and we have tried to use, we have also used production possibility frontier to represent whether it should be convex, it should be concave or not and in which context it is useful, it is also useful in efficiency analysis, it is useful in our also supply-side analysis. And so, these all details. So far as production is concerned, we actually discussed this. I have just said, we have used isoquant and isocost. So, the clarity for this is that isoquants again likewise the indifference curve, it is a combination of inputs and which give same output level keeping other things constant. We have also referred its chapter number for your clarity if we are limited with our time, not to give more emphasis on it. So, we have actually emphasised its respective reading. I am sure with a little extra time allocation you can understand.

Iso-cost- it represents the combination of two inputs and their cost, the combination of their factors and that result in same total cost. And how these are useful in our work? So, we used cost and benefit analysis. Cost refers to the value of opportunity that has been forgone and is indeed considered to be the best measure of cost. And even if you might have heard about companies who are recruiting their persons, they are right these days giving CTC salary (cost to company salary), they include all possible costs.

And in marginal benefit- It is the additional satisfaction derived from consuming an additional unit of service or product. Marginal cost is the additional cost incurred by producing extra/ more unit of production service. So, the jargon used in health economics are epidemiology field- are like the frequency, especially in epidemiology field we use frequency and distribution and determinants of disease and we try to evaluate the clinical effectiveness of those different forms of care. We use indirect cost which refers to the losses incurred by society due to the impact of disease, illness and treatment. They include losses

incurred from an inability to engage in normal daily activities, work, domestic responsibilities, social and recreational activities, etc.

Direct costs are also explained. This uses resources for their direct treatment and healthcare process. Intangible benefits that relate to the issues such as improvements in health and well-being or quality of life. Intangible cost relates to issues such as anxieties and the impact on quality of life resulting from participation in various programs. They are generally difficult to measure and value and often not included in the construction of the cost profile of an economic evaluation. We have used also the concept called willingness to pay (WTP) as part of our economic evaluation principles of economic evaluation chapters.

WTP (willingness to pay), is the maximum amount of money an individual is willing to pay or give to benefit from a particular intervention. Suppose you want to evaluate a government program how far they are willing to pay for an intervention in a program. Similarly, willingness to accept is the minimum amount of money an individual is willing to accept to not benefit from an intervention. So, again what do you mean by intervention? It refers to a need treatment- maybe a drugs, device, therapy or policy that is used or attempts to improve health outcome.

Effectiveness refers to the extent to which a given intervention or service produces health outcomes, in individuals who are offered that intervention or service. So, basically, the effectiveness is specific to the health outcomes. Similarly, some concepts are used in different books, such as HTA (health technology assessment) that is precisely a systematic evaluation of properties, effects or other impacts of healthcare technology. It is designed to provide objective information to support healthcare decisions and policymaking. Some financial incentives are also as part of the discussion. This refers to potential to influence professional behaviour by affecting either their income or expenditure related to alternative decisions.

Efficacy is hugely used in our module that refers to the extent to which a given intervention or service produces a particular health outcome. In individuals who fully comply with recommended treatment under ideal clinical settings. This is, in contrast to effectiveness. Please note that we have said we are targeting a particular health outcome when efficacy is discussed. Economic evaluation, a term we have used largely, is on-economic appraisal, which refers to comparing alternative courses of action in terms of their cost and consequences to make a choice.

And more interestingly, we have used the quality of life indicator citing the health-related quality of life that is HRQL such as we have also taken the standard databases, and standard systems which are using different health-related quality of life indicators. And most importantly, we have discussed about QALY (quality-adjusted life years) and we will also refer in that respective chapter about what about UK, what about US, what about Finland and their model. We have also tried to give you, all possible health states in that chapter to measure the quality-adjusted life years. We also emphasise on DALY (disability-adjusted life

years), and even this is largely used in some context though there are some issues, as responses are not counted in DALY, but largely in QALY. You will get the details in the respective chapter, especially in week number 9. And this HRQL can be assessed using disease-specific, generic or preference-based measured tool.

Cohort models, they are some concepts, also used by healthcare economists or health economic chapters. These factors consider and characterise the average patient's experiences, but not the individual patient's experiences. Hence, it is called cohort from a population that shares the same characteristics. So, decision tree and markup models are the two most common cohort models. We are explaining of these in unit number 9. That is week number 9.

So, other interesting aspects are called sensitivity analysis, which is a technique used in economic evaluation or decision analysis to determine how or where plausible changes in uncertain clinical or costing variables affect the main results of the analysis. We have used efficiency as well, as a term this refers to optimal allocation and use of scarce resources. Two common and related types of efficiency are- technical and allocative efficiency.

Technical efficiency refers to the production of the maximum output level for a certain combination of input factors such as raw materials, working hours etc. Within healthcare, the term technical efficiency refers to choosing a program or an intervention to achieve a given set of objectives or a level of outcome with the fewest allocation of resources. Whereas allocative efficiency refers to the decisions about the distribution of resources across a range of interventions within a given system. Interventions compete with each other for their implementations. Within the healthcare system, allocative efficiency involves the distribution of healthcare resources across healthcare programs and interventions, that is, how much of these are allocated and whether to invest resources in a particular healthcare program or not.

These are some of the important concepts we have used, but they are just some of the information. There are so many concepts we have also used. I am not taking through all these at this moment because this is just the introduction as part of our module. I am suggesting that everyone please go through the reading. In our next lecture, we have started discussing about health as an economic good as part of the introduction week only. So, some of the important reading we have cited. Even we have also given their respective chapters with their reading in their respective lectures.

I am sure that the entire six lectures will be very helpful. And however, if you are still confused somewhere, we have live sessions for discussions. I am suggesting every one of you should raise some doubts, we will be happy to address it. With this, it is time to close here, and we are expecting your participation. Thank you.