General Economics of Health

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Since the Resource available to the health services are limited, and the potential needs of patients are unlimited, some allocation of resource is essential. This problem has now become widely recognized but the main perception realized it when the service was first introduced in the cost of Health (1952) Robert & Wrote : [1]

I can not share the facile optimizer which believe that the straits in which the Health service finds itself are only **'teething troubles'** *and that there are no difficulties which human ingenuity can not surmount. On the contrary I believe that the problem is by its very nature insoluble. From the practical point of view the task of the medical profession and the administration will be to determine how our limited resources can be put to the best use, free and comprehensive health service is a noble ideal, but one which the country cannot under existing conditions attain. This axiom holds good for India also.*

Decision Making:

It is clear that some choice in allocation has to be made and it should be as rational as possible. It is only comparatively recent that simple decision making has been analysed and though there were earlier writings, **Theory of Games and Economic Behavior**.(Von Neumann and Morgenstem, 1944) **2** marks the first extended attempt to encompass this subject. The inclusion of 'games' may come as a surprise but just as a two person game like chess can be though of as a sequence of alternative decision. So a doctor diagnosing his patient may be considered to be playing a game with nature. However, the analogy doesn't hold good. Since in game theory it is assumed that each opponent is playing optimal strategy, where as nature is under no obligation to do so and in general does not.

In Medicine we operate in a state of uncertainty in the sense that the outcome of a decision is not known with certainty but only with a certain probability. Probability theory teaches us the way in which a numerical measure can be attached to a chance or probability, and the laws governing the probabilities of more than one event occurring. A little reflection suggests that we shall also need some numerical measure for the value or worth of the outcome of a particular decision. It is usual to give the name utility to this numerical measure of value, so that the mathematics we shall need will be that of probability and decision theory. **3** Decision within the

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Health service occur at different levels of organization. There is therefore a hierarchy of decision making. At the lower level, the decision is made by an individual doctor about an individual patient. The decision might be, for example, choice between medical and surgical treatment of sciatica. Only one person is involved in the decision and only one patient. At the next level, there can be a decision on a choice of resources. Some money is available for the particular committee and choice exist for the particular resource to be purchased. The choice might lie between an extension to a department of radiology or a department of Physiotherapy. In this decision there is a choice of resources and this will affect different patients, one set will tend to gain and the other to lose, and the decision is taken not by an individual but by a group. At the next stage in hierarchy, perhaps a department of Health, the decision can be more extended involving larger sum of money, a decision, for example, whether to build a new hospital. The decision might also arise whether to employ some preventive measure since, if this is to be done, it has almost certainty to be done universally and if it is to be enforced, may require statutory action. At the highest level of hierarchy is the government, where decisions are taken which allocate resources between say, health & education.

Analysis of decision:

The formal analysis of decision is still undeveloped, but it is possible to make some progress with the analysing of decision taken at the lowest level **4** i.e. between doctor and patient. We have as yet no formal method analysis the decision of a group such as a committee. It is therefore seen wiser in this Paragraph to consider such analysis as is already possible between doctor and patient and the extent to which the conclusions reached may affect policy within the Health service.

Value of Life:

Life, it is often said is priceless, but this belief sprigs from a mis under standing and depends on who is making judgments. The monetary value of human life is therefore a notional one.

As in general Economics utility Theory has Impellent Utility this is so in Economics of Health. **5** The wagering Technique **6** has worked well is some particular situation as simulated situation of a given patient with a set of states of wealth represented by different level of visual activity.

Another Method to measure the utility is probability of an outcome which in medicine is usually called **Prognosis.**

The monetary cost of treatment is to be taken into amount but 'cost' is a complex concept and will have to include any pain or anxiety incurred by the patient.

Best treatment:

With these estimates of the variables in the treatment decision model, it becomes possible to calculate the best treatment i.e. the treatment that has the greatest expected value. Though we can see the possibility of the model, we can-

not do this complete calculation since estimates of utilities etc. have not yet been made.

This treatment decision is clearly at the terminal of the doctor's decision free and when the patient is first seen, treatment cannot usually be allocated immediately. Ideally we might like a function which allocated a treatment Tj on the basis of the patient state

$$Tj = f(x)$$

Where x is a vector representation the state of the patient so that, given this state, the treatment decision function would immediately, give us appropriate treatment. This is not in general possible, because of the enormous number of treatment and the size of the state vector representating the patient. It may be possible in a particular cases. We require some reduction of the problem and this is supplied by the concept of disease.

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