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Conceptual Paper

Estimation of the Economic Burden of Tuberculosis in India

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Tuberculosis is a disease of global concern. The WHO declared it as a "Global Emergency" back in 1993 [1] and it still is so. Being in a government hospital setup for more than 5 years now and after seeing hundreds of patients suffering from this deadly illness, I feel that although a lot of research are going on and national programs are being launched, the economic burden that is developing because of T.B. is a big threat to our economy, both at the national and personal levels.

Going by the traditional stratification of the costs involved, the various divisions can be such as Direct medical cost, Direct non-medical cost and Indirect Cost which encompasses parameters like Income loss, taking loans and selling properties to afford the cost of the treatment. But there is another aspect of social stigma which in my opinion hampers the ultimate outcome of the treatment and the mental status of the patient more than anything else. As per the Endowment Effect theory [2], we attach more value to things which are or people who are very close to us. But often I see that the family members abandon the patient totally and relocate to some other location, fearing that their children or any other member might have to suffer from the same. While this might be true, but the period post Directly Observed Treatment Short course (DOTS) where the patient is not actively supervised by the health workers, is the most important phase of the treatment. In most of the relapsed cases of T.B, the patient gives a past history of discontinuity of the medications associated with complete negligence by the family members. This gives rise to Antimicrobial Resistant varieties of the disease, the MDR-TB and XDR-TB, leading to the usage of costlier drugs. Also, the patient becomes a source for the other people to get infected too. The externalities hence increase, contributing to the already high financial burden of the pre- treatment and treatment phase. The central tendencies of all the parameters show that we need to actively sort out a way to limit the ever increasing economic burden of this disease.

When I tried to think of the situation from the point of view of an economist, I came up with a few co-relations. The Laffer Curve as developed by Arthur Laffer [3] denotes that the more the tax of an activity/production is, the less it is done/produced. Similarly, if the financial burden of T.B. is high, people would get discouraged to approach the health services and doctors just by fearing that their entire monetary savings might be spent on the treatment of the disease (Figure 1).

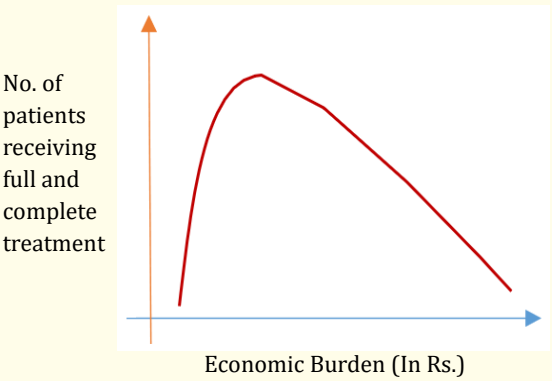

Figure 1

The above graph is a modification of the Laffer Curve showing the relation between the treatment of the patients and the Economic Burden associated with it. While this graph is based on the original concept as developed by Arthur Laffer and still shows some signs of improvement of the scenario in spite of the increase in the financial costs up to a certain limit, in my opinion the actual graph should be something like this (Figure 2).

The slope of the graph never becomes positive, giving us much negative thoughts about the future of this pathology. This explains the global concern of the economic burden of Tuberculosis and its impact on the disease load in turn.

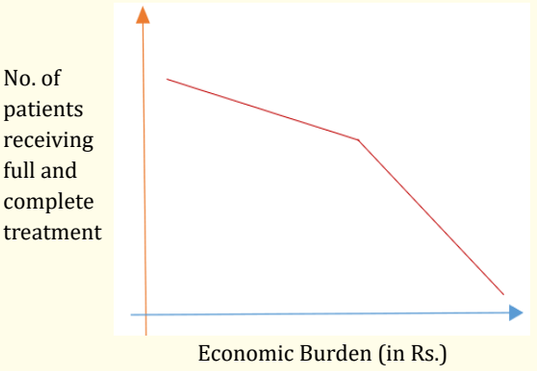

Figure 2

Another co-relation that I can draw from the world of economics is that the situation is not like the Ricardian Equivalence Proposition [4] where the people will start saving anticipating a future expenditure. In most cases the detection is sudden, leaving no time or scope to save any money. Also, the patient won't be able join his/her work for quite some time while the expenditure goes on increasing especially in case of an MDR-TB or XDR-TB. Sadly enough, it is often seen that the family members also stop spending on the drugs and treatment procedures after a while.

The economic burden of the disease hence can be viewed in light of the above-mentioned perspectives.

On the National scale, the economic burden on the Government and its policies to eliminate the disease is immense. Maintenance of the peripheral T.B. laboratories, RNTCP centres, making sure that the drugs are available even in the remotest areas and involvement of the community workers are some of the many responsibilities of the Government of India.

While many steps and actions are being taken to reduce the prevalence and incidence of the disease, I feel that there is a need of some economic indices which will denote the outcome of the measures taken by the Government.

Just like Disability Adjusted Life Years (DALY) [5] which denotes the average years of life lost due to a particular disease or disability, we can introduce Disability Adjusted Economic Burden (DAEB) for Tuberculosis based on the total cost incurred due to the illness. By using standardized instruments such as EQ-5D [6], we can perform cost-utility analysis of our national programmes like the RNTCP. We can introduce measurement index such as Physical Quality of Life Index Post T.B. Treatment (PQLI-Post Treatment) in order to justify the term "burden". If the outcome shows glimpses of positivity, I think we should look over the fact that the cost is high and replace it with terms such as "effect"- Economic Effect of T.B.

So, we can find a new index to analyze the scenario. It might be called the Tuberculosis Economic Burden Index (TEBI) which includes (Figure 3).

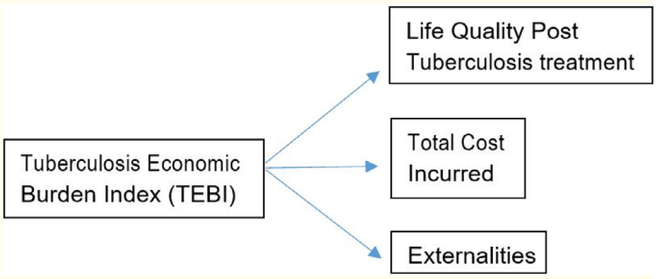

Figure 3

We have to assign specific scores to different ranges of the components. I have not included many parameters so as to reduce the constraints and variability, thus applying the Lean Six Sigma principle to find an elegant index. The lower this index would be, the higher would be our success to control the disease effectively.

The R.O.I on control and elimination of Tuberculosis is massive, so much so that the economists have put this under the "No-brainer" category. We have to keep our faith on the Economics of Optimism [7] and put our best foot forward to join hands together and make elimination of Tuberculosis as one of the prime Sustainable Development Goals of this century.

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