TB in Children & Malnutrition: A Complex Interrelationship

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1 (cover photo) Parvati (in the center) from panna district (MP) – Who is suffering from tb and malnutrition both
2 Prashant Kumar dubey is a REACH fellow. During the fellowship they start to write a paper on the basis of the field experience.
Introduction

Every day 4000 people develop Tuberculosis (TB) in India and 1000 people die from the disease. It means that in India, three deaths occur every two minutes due to TB despite the fact that TB is preventable and curable. India accounts for one-fifth of the global TB cases. On an average, TB leads to loss of annual family income by as much as 20 per cent. It has a direct and indirect cost to the country in the region of 23.7 billion USD. About 300,000 people died from TB in India in year 2012. Men, women and children— all were those amongst these deaths. Across the world, every year 1 million children are detected with TB which accounts for 10-15% of total TB cases.

It accounts for 10 high probability causes of child mortality.

According to the estimates of the World Health Organisation, this year 10 to 15% of the 9 million TB patients will belong to the age of 14 years and below who will need the TB treatment. This data is apprehended to rise should we fail to check the infection amongst the children. Since TB in children is largely owed to the TB of adults, it is very important that...

What is TB (Tuberculosis?)

TB is an infectious disease caused by the bacillus Mycobacterium tuberculosis. It is a rod-shaped bacteria. It typically affects the lungs (pulmonary TB) but can also affect other sites (bones and joints, kidneys, genitourinary tract, spine, lymph gland etc.). When TB affects organs other than the lungs, it is referred as extra pulmonary TB.

This disease is spread in the air when people who are sick with pulmonary TB expel bacteria by coughing or sneezing. When the healthy people are exposed to this bacteria, they too get infected with this disease without being aware of it. It is important to recognise here that whilst one may inhale the bacteria by being in the proximity to the exposure, s/he has been infected by TB bacteria but is not (yet) ill with the disease. However, it is crucial to detect and mobilise symptomatic cases earlier so as to reduce transmission.

Source: Booklet on Tuberculosis in India, Global Health Strategies, May 2013

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3 This document has been produced by Prashant Kumar Dubey for Vikas Samvad.
4 RNTCP TBC India, http://www.tbcindia.nic.in/rntcp.html
5 Tuberculosis Fact Sheet No. 104, WHO. http://who.int/mediacentre/factsheets/fs104/en
7 Annual Status Report, 2012, Revised National Tuberculosis Control Programme, P 51
8 Global Tuberculosis Report, 2011, World Health Organisation
9 Global Tuberculosis Report, 2011, World Health Organisation
family members and care givers are educated about safeguarding the children through prevention of TB infection.

According to “TB in India” national report, as many as 81482 cases of children TB were detected in year 2012 which accounts for 7 per cent of all TB cases in the country. These days Madhya Pradesh is witnessing such 4000 new cases every quarter which point primary symptoms of TB. Thus, 16000 new cases of children’s TB are surfacing in the State every year. However, these figures pertain to those children who are reaching the hospitals and are thus amenable to detection of TB. There could, however, be lakhs of children who have not been examined at all.

Therefore, the detected cases are only the tip of the iceberg. Also, the issue of children’s TB assumes significance in view of high prevalence of child malnutrition in India. Report for year 2012 of the Government of India’s Ministry of Statistics and Programme Implementation informs that about half (48%) of India’s children are malnourished.

### Burden of TB in India

- According to World Health Organisation, 86 lakh people developed TB in year 2012. Of these, about 22 lakh, i.e. 26% TB cases were from India.\(^\text{10}\)

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\(^\text{10}\) TB India 2013, Revised National TB Control Programme (RNTCP), Annual Status Report, Government
On an average, TB is responsible for 1000 deaths per day in India\textsuperscript{11}. It thus causes about 300,000 deaths every year.

About 70\% of TB patients in India are in the age of 15-54 years and that they are the bread winners for their families.

TB results in erosion of family income by 20-30\% every year. Direct and indirect cost of TB to India sums up to Rs. 23.7 billion which has a significantly adverse effect on country’s economy\textsuperscript{12}.

Source: Countdown to 2015, Global Tuberculosis Report 2013 Supplement

\textsuperscript{11} TBC India, Directorate General of Health Services, Ministry of Health and Family Welfare, http://www.tbcindia.nic.in/faq.html

Situation of Madhya Pradesh

Situation of TB in Madhya Pradesh is more pronounced because the State is at the peak of malnutrition. Every second child in the State is malnourished. About 5.2 million\textsuperscript{13} children are malnourished in the country and 880,000 of these children suffer from acute malnutrition. The State is worst performing in terms of Infant Mortality Rate (IMR). At an IMR of 56\textsuperscript{14} per live births, as many as 112,000 infants died in the year 2012 in the State, assuming a total number of live births at 20 lakhs in the year. A large proportion of these infant deaths are due to TB as well. Another ground level truth about Madhya Pradesh is that children below 6 years are receiving food with an energy of only 758 calories whereas they require an energy intake of 1200 to 1700 calories. In a sense, it could be surmised that the children in the state are actually receiving meals only once a day\textsuperscript{15}.

Interrelationship between Nutrition - Malnutrition and TB

Children suffering from TB are generally found to be malnourished and anemic. Malnutrition and TB are deeply intertwined. Malnutrition primarily affects the Cell Medicated Immunity\textsuperscript{16} (CMI) and it is the CMI which plays an important role in preventing TB. Risk becomes multifold for the malnourished children who are suffering from TB\textsuperscript{17}. Being able to combat TB, one needs to have diet rich in fats, Vitamins, minerals and proteins. And it is difficult for the poor families to be able to mobilise such a diet. Hence, TB is also referred as the illness of the poor. TB, in tandem with malnutrition reinforces the vicious cycle poor health and poverty. However, what people generally do not know is that TB by itself is a major risk factor and that it can be one of the potential causes of malnutrition\textsuperscript{18}.

\textsuperscript{13} National Nutrition Institute (NIN) Hyderabad Survey, 2010  
\textsuperscript{14} SRS, September 2013 for year 2012  
\textsuperscript{15} Death due to Malnutrition and Some Logical Aspects-2, Sachin Kumar Jain,  
http://sachinwriteson.blogspot.in/2008/12/1.html  
\textsuperscript{16} Malnutrition and childhood tuberculosis,NIN,Indian council of medical research jamai osmania,India,  
Dr P. bhaskaram  
\textsuperscript{17} Sharma, Pratul: "Malnutrition is Hindering the Growth of Indian Children - A Report is available at  
\textsuperscript{18} Review of Literature on Nutrition & TB, TB Control Programmes, USAID, April 2008,  
In patients with tuberculosis, malnutrition leads to reduction in appetite, nutrient malabsorption, micronutrient malabsorption, and altered metabolism leading to wasting, muscles become atrophic and the patient becomes revulsive towards food and shows signs of general weakness\(^\text{19}\). Alongside, the TB patient has to expend more energy in coping with the infection leading to higher requirements for energy and nutritional intake\(^\text{20}\). In children, these requirements are further pronounced because of their growth as well.

Nutrition and TB have a very complex association with each other and it keeps up the vicious cycle of malnutrition, poverty and disease. We all are aware that malnutrition harboring determinant of TB. We also know it well that inadequacy of nutrition delays in restoration of health because it affects the efficacy of antibiotic medicines used for the treatment of TB\(^\text{21}\). Malnutrition is a significant risk factor in transforming the latent TB in to active TB, particularly in children and HIV-affected persons because their immune system is already weak. Status of malnutrition in India is worse than that in many other poor countries\(^\text{22}\). Our country is amongst those where the number of malnourished children is the highest. Here, more than 40% children under 5 years are malnourished. The adults are a little better off in this regard. According to the NFHS-3 Survey in 2005-06, 36% women and 34% men in the age-group of 15-49 years were malnourished.

The World Health Organisation, UNICEF and World Food Programme stated in a joint statement on Severe Acute Malnutrition in year 2007 that “Severe Acute Malnutrition can be a direct cause of child death and mortality rates of children suffering from severe acute malnutrition reflect a 5–20 times higher risk of death compared to well-nourished children. In this reference, ‘The Lancet’, the world-famed UK’s research journal published a series of six research papers in January 2008. It reports that if the probability of death due to diarrhoea for a well-nourished child is 5%, it becomes 16.5 times for a child suffering from Severe Acute Malnutrition.

\(^{19}\) K B Gupta and others in “Tuberculosis & Nutrition”, Lung India, 2009 Jan-march; 26(1): 9-16

\(^{20}\) ....Nutritional factors that increase your risk of Tuberculosis, NICUS, University of Stellenbosch: http://sun025.sun.ac.za/portal/page/portal/Health_Sciences/English/Centres%20and%20Institutions/Nicus/Nutrition_Facts_sheets/TB%20and%20Nutrition.pdf

\(^{21}\) Nutrition in India, National Family Health Survey (NFHS-3), India: http://www.rchiips.org/NFHS/nutrition_report_for_website_18sep09.pdf

Further, the probability of death for a severely acute malnourished child suffering from pneumonia becomes 10-fold as compared to the well-nourished child. In the same vein, it is apprehended that such children suffering from various kinds of infections and diseases have an 18 times risk of death\textsuperscript{23}. Let it be known that TB is a contagious disease\textsuperscript{24}.

As we are aware, effect of TB becomes more pronounced in case of severe acute malnutrition as compared with other concomitant serious diseases. Many studies provide an evidence that those who suffered with TB had their nutritional status more adversely affected. Even leprosy does not have so much of impact. Another study in India reveals that the TB patients were found to be 7 to 11 times weaker as

\textsuperscript{23} Death due to Malnutrition and Some Logical Aspects-2, Sachin Kumar Jain, \url{http://sachinwriteson.blogspot.in/2008/12/1.html}

\textsuperscript{24} Source- Booklet on Tuberculosis in India, Global Health Strategies, May 2013
compared to those whose BMI was more than 18.5 whilst the MUAC measure was in excess of 24.5 cm. A number of studies within India and elsewhere in the world endorse this finding. A research has been published in a health journal, PLoS in its issue of October 2013.

The research pertains to association between the nutritional status of patients suffering from pulmonary TB and death. This research carried out by Mr. Anurag Bhargava, Associate Professor of Himalaya Institute of Medical Science, Dehradun and Mr. Madhukar Pai, Assistant Professor, McGill University, Montreal showed that there is a positive association between the TB patients and drop in their nutritional status. Likewise, Jan Swasthya Sahyog found in its study done 1695 TB patients that 85% of them were suffering from malnutrition. Mr. Yogesh Jain, the co-author of the research calls upon the Revised National TB Control Programme (RNTCP) to take due cognizance of the research. He laments that the RNTCP does not even refer to the issue of malnutrition. Mr. Bhargava informs that the 56 countries where maximum cases of TB with malnutrition have been identified have sought to incorporate the component of malnutrition within the ambit of TB control programmes whereas the RNTCP in India appears to ignore the crucial association between the TB and malnutrition.

Dr. Payan, Dr. Kadam and Dr. Kotresh of Community Medicine Department, Baruweshwar Medical College and Chitradurga Hospital presented a paper in the 40th National Convention of IAPSM in January 2013. They presented an association between the TB and Severe Acute Malnutrition (SAM) amongst the 265 SAM children admitted in the Nutrition Rehabilitation Centre of Chitradurga hospital. Their study reveals that the probability of TB is very high in children suffering from Severe Acute Malnutrition.


26 www.plosmedicine.org

27 Malnutrition is rampant among rural TB patients. rema_nagarajan.tnn.oct.28.2013
Micronutrient supplementation in individuals with active tuberculosis

Undernutrition increases the risk of tuberculosis and vice-versa and, as a result, undernutrition is highly prevalent among people with tuberculosis. Young children and pregnant women are particularly vulnerable to the effects of undernutrition and TB. Women with TB may be at higher risk for pre-eclampsia and other complications during pregnancy. TB also increases the risk of premature birth, low birth weight and perinatal death.

Low circulating concentrations of micronutrients, such as vitamins A, E and D, and iron, zinc and selenium have been reported in some patients, though levels usually return to normal after 2 months of appropriate TB treatment.

WHO recommends that a daily multiple micronutrient supplement at 1× recommended nutrient intake should be provided in situations where fortified or supplementary foods should have been provided in accordance with standard management of moderate undernutrition (in accordance with the IAMI manual, Technical Notes etc.), but are unavailable.

The WHO recommends that all pregnant and lactating women with active TB should receive multiple micronutrient supplements that contain iron and folic acid and other vitamins and minerals, according to the United Nations Multiple Micronutrient Preparation (UNICEF, WHO, UNU joint report) to complement their maternal micronutrient needs.

It further recommends that for pregnant women with active TB in settings where calcium intake is low, calcium supplementation as part of antenatal care is recommended for the prevention of pre-eclampsia, particularly among those pregnant women at higher risk of developing hypertension.

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28 e-Library of Evidence for Nutrition Actions (eLENA), WHO
Role of Micronutrients

Because of diverse metabolic characteristics and functions, micronutrients have been accepted as essential for optimum human health. Micronutrients deficiency is considered to be the most frequent cause of secondary immunodeficiency and infection related morbidity including tuberculosis. TB affects different nutrients and can aggravate malnutrition in following manifestations:

- Vitamin D: Abnormalities are observed leading to lower serum or plasma calcium level.
- Vitamin A, C and E: TB lowers the concentration of antioxidant Vitamins A, C and E.
- The concentrations of iron, zinc, and selenium is dropped down in TB patients.
- Zinc: TB lowers zinc plasma causing reduced Vitamin A metabolism.
- Selenium: Decreases due to TB which is an important trace element in defining immune power.
- Iron: Concentration drops down leading to anemia.

Nutritional supplementation may represent a novel approach for fast recovery in tuberculosis patients. In addition, raising nutritional status of population may prove to be an effective measure to control tuberculosis in underdeveloped areas of world.

Policy Issues with regard to Children’s TB

Children’s TB has not only been neglected at the country level but also at the global level. A May 2009 paper of the Oslo University informs that the global measures to combat TB have rather neglected the attention to children’s TB. The paper states that “despite the importance of the disease with the public health, TB is rarely investigated in children, as the diagnosis is difficult in the young age groups and children are usually not infectious”. Lancet 2008 paper reiterates the situation that difficulty in investigation, unavailability of resources for TB control, lack of faith in immunisation like that in BCG and limitations in resources in developing countries like India and the prevalent belief that TB amongst the children is a rare

29 KB Gupta and others in “Tuberculosis and Nutrition”, Lung India, Vol. 26, Issue 1, Jan - Mar 2009
30 Quynh Nga DT, “Risk factors for tuberculosis infection among child contacts of pulmonary tuberculosis cases [dissertation] (Oslo), University of Oslo, May 2009
phenomenon and such other social beliefs act as deterrents to measures for TB contact tracing.

In our country as well as in the state of Madhya Pradesh, TB is investigated only in case of Severely Acute Malnourished children and that too for those children who are able to reach the Nutrition Rehabilitation Centres (NRCs). The government has no means to reach out the investigation service to those children who do not have access to the NRCs. Also, there is no programme in place for detecting TB amongst the school-going children of age 6 to 14 years. Investigation of TB has not yet become an essential component of the country’s School Health Programme.

A reference to the Annual Administrative Report for the year 2012-13 of Department of Public Health & Family Welfare, Government of Madhya Pradesh would show as to how serious we are with regard to children’s TB. The said report does not present any data pertaining to children’s TB. The report is silent with regard to detection of child TB, treatment given or the measures that the state Government has in place with regard to addressing the problem of children’s TB. The State does not have any information on this!

It needs to be noted that the only vaccination available for protecting children against TB is BCG. The performance on this count too has

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**Diagnosis of TB is mandatory in Nutrition Rehabilitation Centres in Madhya Pradesh**

It is mandatory that TB investigation is done for all Severely Acute Malnourished (SAM) children who are admitted in the Nutrition Rehabilitation Centres (NRCs). In addition, TB investigation has been made mandatory for child’s mother as well. If the child or the mother have any signs and symptoms of TB, their treatment has to be carried out in accordance with the treatment regimen provided under the RNTCP. This is an excellent provision and results are quite encouraging. In just one NRC of district Shivpuri, 47 children were detected to have TB over a period of 8 months. It means that on an average, one child is found to be suffering from TB every 6 days. It needs to be noted that 75% of these TB affected children belong to Scheduled Tribes.

Although there are 320 NRCs in the State, this TB investigation does not necessarily appear to be taking place for all admitted children. The NRC of District Panna is a case in point. Neither the District TB Officer nor the Dietician at the NRC could explain as why the TB investigation is not being pursued in the NRC. They say that they make a superficial checkup and if they feel the need for investigation, then only the same is conducted. Likewise, here the mothers’ TB investigation is also not being carried out.

Source: Directorate of Health Services, NRHM Office, MP/Child Health/RCH/2013/7085 dated 22nd April 2013.
been poor in the past 3 years. Whilst 84% children were administered with the BCG vaccination in year 2010-11, it has come down to 80% in year 2012-13.

Apparently, there has been limited progress with regard to generating awareness about TB in the State. Though a new case detection rate was targeted at 216 per one lakh cases in accordance with the Government of India norms, the State realised only 126 cases per lakh in year 2011 which dropped to 121 per lakh in year 2012. It goes to show that how badly we are lagging behind the national average.

We also know that malnutrition and TB are complementary to each other. Each could be predisposing to the other and/or be the consequence of each other. However, what is worrying is that there is no coordination amongst the departments of Public Health & Family Welfare, Women & Child Development and the School Education, in as much as the issue of children’s TB is concerned. In the first place, there is no inherent arrangement for TB investigation of children. What could be done is to provide supplementary nutritious food at the Anganwadi Centres for under 6 years children who have TB. Likewise, children of age 6 to 14 years who have TB should be given nutritious food under the Mid-Day Meal Scheme so as to help them recover from the disease.

Concomitantly, the significant aspect of tracing the children as well as the adults has failed to occur in the wake of non-availability of appropriate guidelines for the same with the result that the TB-affected patient spreads the bacteria across these institutions. One needs to acknowledge the perilous situation wherein an individual carrying with him/her the active bacteria goes around infecting 10-15 other persons in a year.\(^\text{31}\)

\(^{31}\) Tuberculosis Fact Sheet Number 104, WHO. http://who.int/mediacentre/factsheets/fs104/en/
Some More Practical and Policy Constraints

- **Lack of Full Immunisation**

So far, the only vaccine available for protecting children from TB is BCG (Bacille de Calmette et Guérin). It is believed that the vaccine has the potential to provide a safety net for the children up to 15 years. However, its impact seems to vary. Therefore, whilst the BCG has succeeded in preventing serious illnesses for the children, it needs to be kept in view that even with its vaccination, the probability of contracting TB cannot be ruled out. Further, we have not been able to secure mandatory universal vaccination of all children with BCG. It brings out that though we are seeking to control the TB post its occurrence, we have not been alert to the call for its prevention. In addition, we need to adopt other innovative modern preventive medical measures. Treatment of latent TB infection with a drug called Isoniazid is an inexpensive, effective prevention method used in the United States, Europe and elsewhere since the 1960s. Unfortunately, less than 0.1 percent of people with HIV who are eligible for Isoniazid Preventive Treatment (IPT) are receiving treatment.

- **Lack of Facilities for Appropriate Diagnostic Investigations**

Even at present, we are dependent upon old practices and approaches in investigating TB amongst the children. A diagnostic procedure known as GeneXpert is used in overseas. GeneXpert\(^\text{32}\), the state-of-the-art test machines for tuberculosis shortens the time to diagnose drug-resistant strains of TB from weeks to only a few hours. By allowing health workers to quickly diagnose drug resistant TB and put patients immediately on treatment, GeneXpert devices can help halt the spread of this deadly form of the airborne disease. However, this procedure is yet to be adopted in our country. We continue to pursue tests like the Mantoux test which cannot help diagnose active TB and only renders knowledge about the presence of germs. Some TB-infected people who have other health problems, especially diseases affecting the immune system, may have a negative result from this test. These cases are termed false negatives. False positive results are also possible

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and they become relatively more common when there is not much TB infection in a population.

- **Unavailability of Medicine for the Underweight Children**

  Children are given medicine in accordance with their weight. The TB medicine under the Revised National Tuberculosis Control Programme (RNTCP) has regimen for medicine only for children whose weight is in the range of 6-30 kg. Does it mean that children who weigh lesser than 6 Kg do not have TB medicine in place for them? It would thus either result in wrong medication being administered to such children or they would be left out. It is apprehended that children are being given medicines by cutting the adult dosage – typically an unscientific approach in medical treatment!

- **No Provision for Nutrition alongside Treatment of TB**

  We are well aware that malnutrition and TB have a complementary association. However, we find its reference absent from the protocols pertaining to our RNTCP. It thus brings out that the malnourished children and adults do not have programmatic support for meeting supplementary nutritious food. When questioned on this, the Department of Public Health & Family Welfare seek to wash off their hands on the plea that nutrition is not part of their domain of role and responsibility. Likewise, when confronted with the question of additional nutritional food for the children affected with TB, the Department of Women & Child Development dismiss the issue saying that TB is not their subject! The moot question is that when we all know it well that nutrition is critical for adults and children vis-à-vis TB, how is it that it does not form part of fuller circle in securing health that is free from TB?

- **Occasional Stock outs of Children’s TB Medicine**

  It is a well-known fact that in Madhya Pradesh, the TB medicine for children was out of stock for the first six months in year 2013. Though the TB medicine is part of the central supply, the situation of being incommunicative appears to be multiplying the problem. Subsequently, there have been another 2-3 instances of stock outs in the state.

33 [http://www.downtoearth.org.in/content/7500-child-tb-patients-go-untreated-madhya-pradesh?quicktabs_1=0](http://www.downtoearth.org.in/content/7500-child-tb-patients-go-untreated-madhya-pradesh?quicktabs_1=0)
• **No Protocol for Monitoring TB in Children**

No data is available with regard to children’s TB. The State does not have any information about detection of child TB, treatment given or the measures that the state Government has in place with regard to addressing the problem of children’s TB.

• **Lack of Interdepartmental Coordination**

It is vital that an organic inter-departmental coordination is maintained in order to address the intertwined issue of nutrition and TB. However, we witness that it is non-existent. Whilst the Departments of Public Health & Family Welfare and Women & Child Development ought to synergize, even the departments of Public Health Engineering and School Education also need to integrate themselves with this much-needed synergy.

At the same time, if we look at the perspective of adults suffering from TB, we need to recognise that work for them needs to be recast so that it is in sync with their (diminished) capacity as a consequence of coping with the illness of TB. However, no such initiative seems to have been taken up so far which can accord a more humane angle in looking for options of labour in addressing this social problem. There seems to be no provision for additional nutritious diet for adult TB patients. Recently introduced Food Security Act does give a ray of hope. However, it is for the state governments to decide whether they would choose to include the TB patients in the priority list or not.

• **Migration**

TB and migration are deeply inter-related. People resort to migration in search of work. However, when the migration is city-bound, the migrants have to live in slum areas which are hub of TB infection. Whether it is the complete family or it is the head of household, lack of awareness results in undignified living conditions for such migrants. According to an estimate, the urban population will rise to 55 Crores by 2021 and to 80 Crores by year 2041\(^{34}\). In addition, rate of discontinuation of medication midway is highest amongst these critical groups because they miss the

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\(^{34}\) Evaluation Framework for Self-reliant Cities: Technology Education Research Integrated Institution
dosages in their rush for work and problem gets multiplied over time\(^35\). A drug-resistant TB patient is required to take a regimen of medication for a period of 18-24 months and has also to take additional medication to safeguard against side effects. Possibly the patient, finding the regimen of medication tough over a prolonged period of time discontinues it midway. Therefore, the government needs to have a clear policy on migration which accords keen attention to the issue of TB medication. Also, the policy has to take in to account the concerns with regard to migrating children as well.

- **Inadequacy of Budget**

The budgetary allocation which was Rs. 400 Crores in year 2011-12 increased to Rs. 750 Crores in year 2012-13. Though this increase will strengthen the fight against the menace of TB, its adequacy needs to be looked in to. In any case, health is a state subject and that the State Government has committed to provide access to free and high quality TB detection and medication for all under the 12\(^{th}\) Five Year Plan.

- **Absence of Community Engagement**

At the present time, engagement with community in fight against TB has been virtually ignored. The one-way exercise needs to be transformed in to a multi-pronged approach so as to secure an active and sustainable community engagement.

- **Vacancies**

The department of Public Health & Family Welfare has a large number of posts lying vacant. Needless to state that it adversely affects the working of the department. Under the circumstances, attention to critical illnesses like TB gets compromised. There is need for adequate staff so as to be able to detect the cases and monitor their medication. Status of both the Human Resources for Health (HRH) and health infrastructure need rationalization and seamless enhancement so that the challenges facing the public health in the State are effectively met with.

Suggestions

Urgent Need for Taking up Convergent Medical Programme

The State Government needs to take deliberate steps with regard to addressing the issue of children’s TB. It becomes all the more crucial for the State like Madhya Pradesh which has the ignominy of highest rate of malnutrition and Infant Mortality Rate in the country. Accordingly, the state government needs to give due attention to secure governance with inter-departmental coordination aimed at malnutrition as well as TB together. The government may consider a call to action for a centralized and convergent Medical Programme in freeing the children and adults from the menace of TB.

Exploring the Potential of Community Intervention

Addressing the problem of child malnutrition can pave the way for significantly bringing down incidence of children’s TB. Engagement with the community in eradicating malnutrition can be extremely helpful. All approaches that strengthen the processes for active and sustainable community intervention and participation must be explored and pursued with diligence. One may find that combating the malnutrition has the potential of even halving the prevalence of TB!

In addition, the community may take on many roles in regard to TB. If we make a beginning based upon the signs and symptoms, the community can help in identifying persons who are suffering from cough for more than 2 weeks. Subsequently, the community can also support in encouraging the patients to go for investigation of sputum. The community can also act as the pressure group on the government for ensuring that facilities for investigations are maintained and serve as requisite precursor for treatment. The community also has a major role in demanding the medicines should be accessible to the community so that people do not face any hardship in getting the medicines.

Should the person be diagnosed to be suffering from TB, the community has a role in monitoring to ensure that s/he regularly follows the treatment regimen and that the patient does not discontinue the medication midway and is safeguarded against the risk of contracting Multi-Drug Resistant (MDR)-TB. According to World Health Organisation, every year 425,000 cases of MDR-TB surface in the world. Majority of
these cases come from India, China and erstwhile Soviet Union\textsuperscript{36}. Finally, the community needs to go about in keeping a tab on community health and various health programmes from time to time and see to it that the children receive the required vaccinations regularly. It can be possible only when the community engagement is informed and is maintained active. Presently, whilst the government has positioned the Directly Observed Treatment, Short-course (DOTS) under the Stop TB Strategy, they have not yet been integrated with the community. Therefore, the community and the department of health continue to be at away from each other across the continuum of public health.

It is unfortunate that there has hardly been any role of the society with regard to addressing the problem of TB. Accordingly, wrong (false) diagnosis, unregulated and negligent medication, all parts of a support system lacking in prevention/control have given rise to the risk of Multi-Drug Resistant TB\textsuperscript{37}. The civil society has a call to action in ensuring that patients follow the medication regimen in an uninterrupted manner with a heightened sense of morale and motivation. This role needs to be formalized on priority.

TB can also be called as a social disease as the patient suffering from it is looked down upon in the society. S/he breaks down on two counts, one because of the disease itself, and the other in terms of indifference by the society. Since it is a contagious disease, people rather feel unsecured and are repelled away.

We can easily combat the challenges posed by TB provided we can have the community assume the centre stage. It requires to become widely conscious of its role and engagements in this crucial task.

\textsuperscript{36} http://www.bbc.co.uk/hindi/science/story/2006/09/060906_tb_treatment.shtml

A manifestation of “Extreme Drug Resistant TB which is incurable.