Manage TB
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Lecture – 01
How is tuberculosis affecting public health globally and nationally?

Hello in this online course on tuberculosis for doctors, I am going to talk today about how is Tuberculosis affecting public health globally and also nationally.

The objective of this particular talk is to help you understand the global and national trends of tuberculosis, to understand the main challenges in tuberculosis prevention and control, to understand the impact the TB epidemic has caused in different parts of the world and then to understand the principles of a end tuberculosis strategy.

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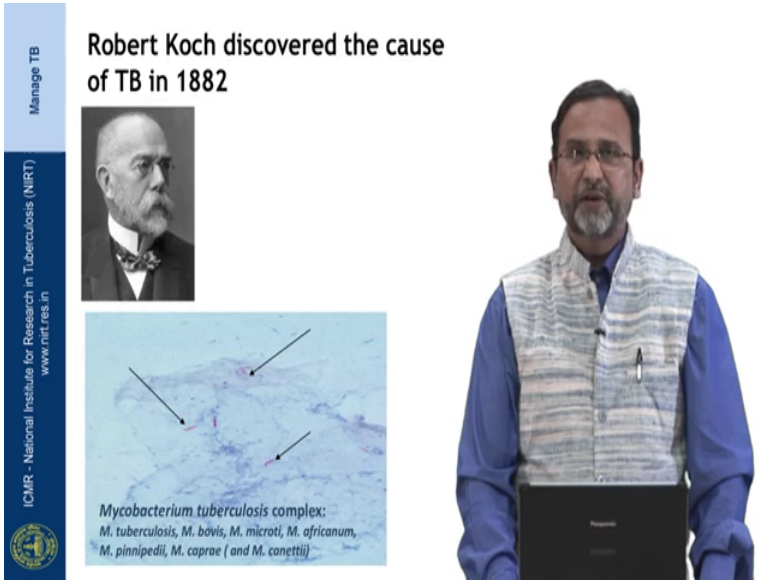

As you might be aware it was in the late 19th century in 1882 that Robert Koch discovered the cause of tuberculosis for the first time and eventually we know that this particular organism called Mycobacterium tuberculosis; we also understood that there are other types of mycobacteria as well that are responsible for causing various types of diseases.

But what is more important to understand that in spite of this knowledge, now that we have for more than 140 years we still are having lots of problems with prevention and control of this particular disease.

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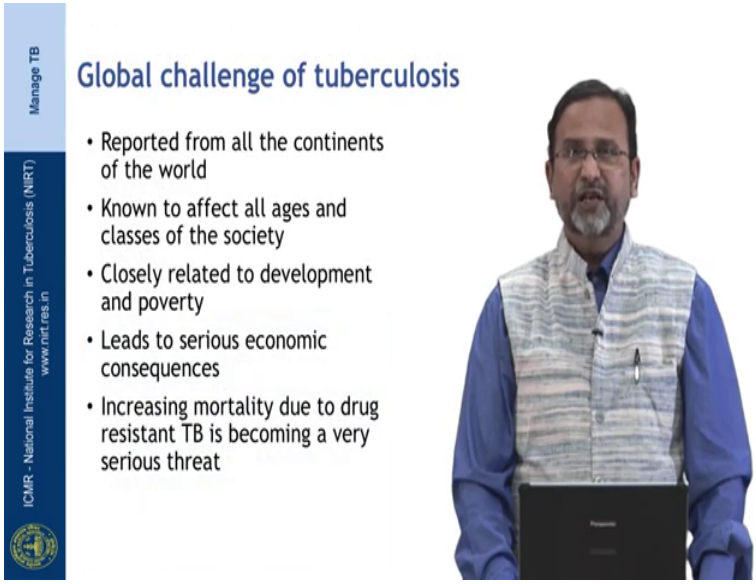

What is the type of challenge that we are facing all over the world with respect to tuberculosis? Primarily we have to understand that this disease is reported from all the continents of the world; it is known to effect all the ages and classes of the society, it is closely related primarily to the development and poverty.

So, it is more commonly observed among poor and under nourished people. It is known to result into serious economic consequences and a very lately we have also been noticing increased mortality because of this disease due to occurrence of drug resistant tuberculosis bacilli which is becoming an important public health threat for our country.

Which are the diseases we consider as of public health importance? Let us take an example of tuberculosis and understand this really well.

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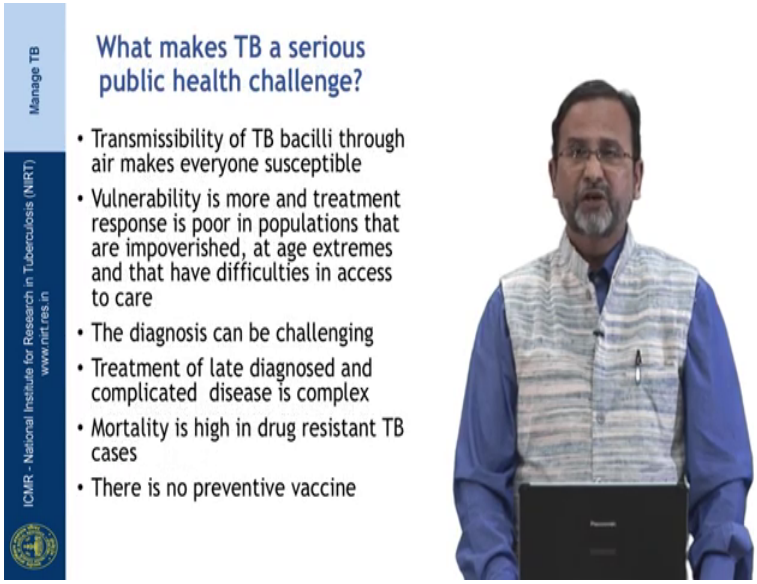

Well because tuberculosis gets a transmitted the bacilli gets transmitted through air practically every single human being is vulnerable or susceptible to develop the disease. This is vulnerability is found to be more in case of impoverished populations and also people who have problems with respect to nutrition, also who are at the age extremes.

So, these are the kind of vulnerable population for populations for tuberculosis. We do face sometimes challenges in the diagnosis of tuberculosis there is no quick diagnosis available for tuberculosis even today.

We now that treatment of the disease although have been prescribed by the national program very clearly it can become challenging in complicated cases particularly when the disease is outside the lungs; where it commonly effects the human body.

And as I mentioned earlier drug resistance which is immerging deaths associated with drug resistant tuberculosis cases is an alarming problem. More over if we just look at it many communicable diseases particularly viral diseases now have a vaccine to prevent the disease, but sadly we do not have a vaccine against tuberculosis today.

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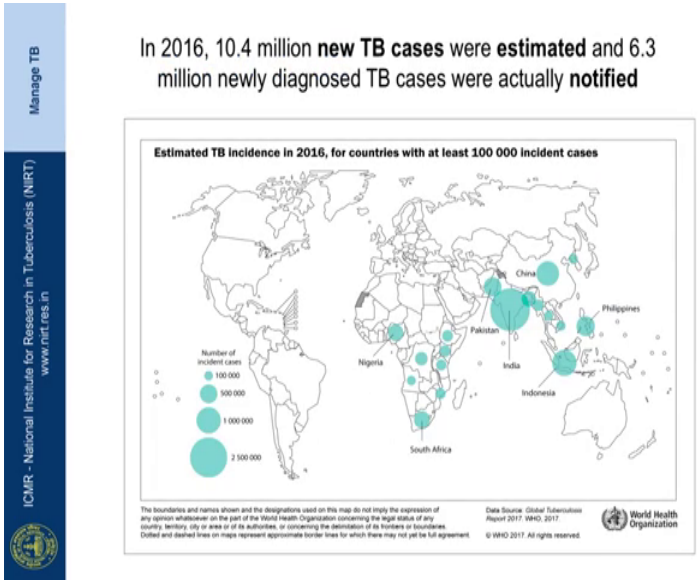

If we just look at this particular map; basically it talks about the fact that there are in the last year 2016 nearly 10.4 million new TB cases were estimated all over the world, but what is important to understand is of these 6.3 million cases were notified.

What it really means is there is a gap in what is estimated for a particular region and what gets notified and what you can understand is if you just look at the green areas on the graph; where the gap is more this particular problem is shown as a larger area.

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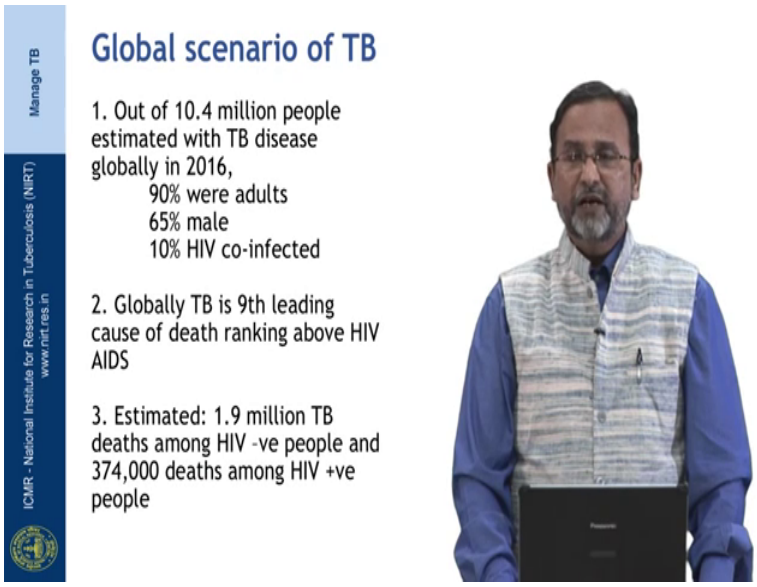

If you look at the global scenario of a tuberculosis as I mentioned to you there are estimated more than 10 million tuberculosis patients in as in 2016 more than 90 percent of these have been found to be or estimated to be adults, predominantly male 65 percent and of these nearly 10 percent are HIV co-infected. So, what is important to understand is this HIV tuberculosis co-infection is a major public health importance problem.

Globally TB is believed to be the 9th leading cause of death ranking about HIV aids and there are estimated 1.9 million TB deaths among HIV negative people of a and nearly 374000 deaths among HIV positive people. So, this two epidemics of HIV and tuberculosis are quite closely linked to each other.

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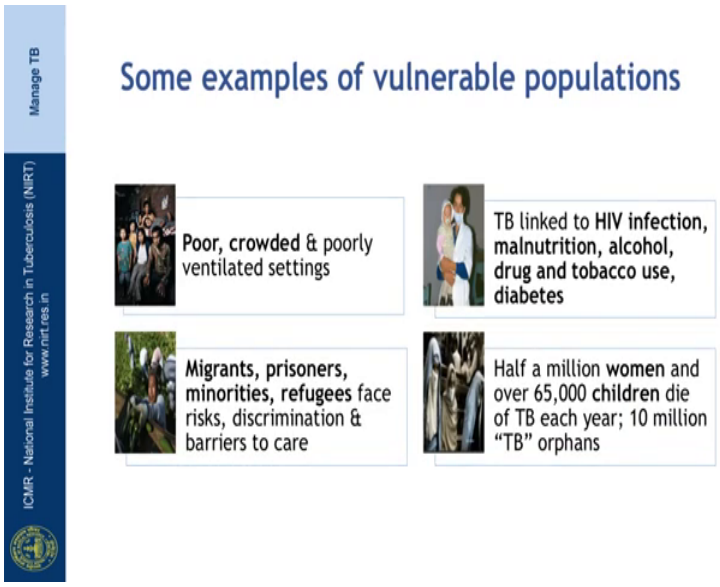

As I mentioned earlier that there are some types of vulnerable populations where in rates of tuberculosis or chances of tuberculosis are found to be more compared to the others.

For example poor, crowded, poor populations residing in crowded locations have a higher risk of acquiring tuberculosis, then HIV infected people those who are having malnutrition, those who use alcohol or drugs extensively and those who are diabetics also have a higher risk of a tuberculosis.

Women and children in particular are again more vulnerable to tuberculosis and unique situations where there are lot of migrant people, there are destabilized populations due to

wars and national natural disasters refugees etcetera they also face high risk of a acquiring tuberculosis.

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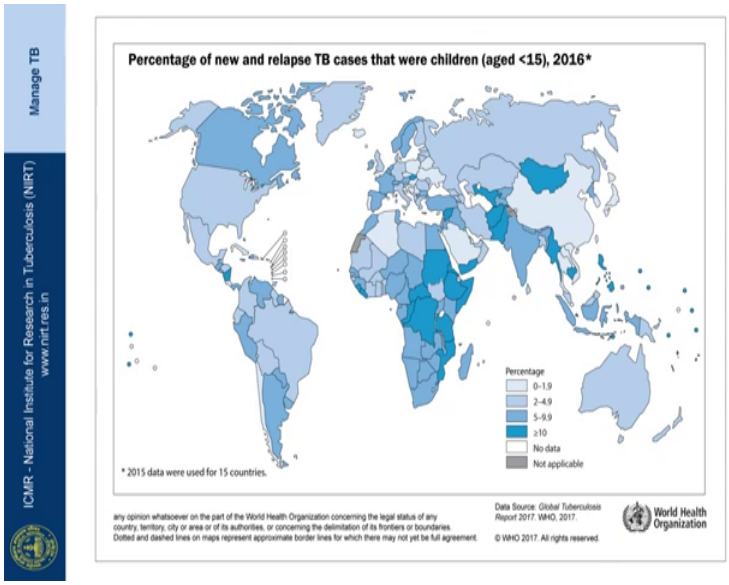

This particular graph I would like you to pay specific attention to the colors which are shown over here. What this shows basically is wherever there is lighter colors the number of children effected in those areas compared to the adults is small, but where you see darker areas the proportion of children to adults in among the TB affected is very dark is much more.

So, you can see in the regions of Africa in the regions of a southeast Asia we definitely have more and more children who are contributing to this big disease burden of tuberculosis.

Thereby meaning that it is not only the adults that we need to focus on for TB prevention strategies, but we need to also focus on children as well.

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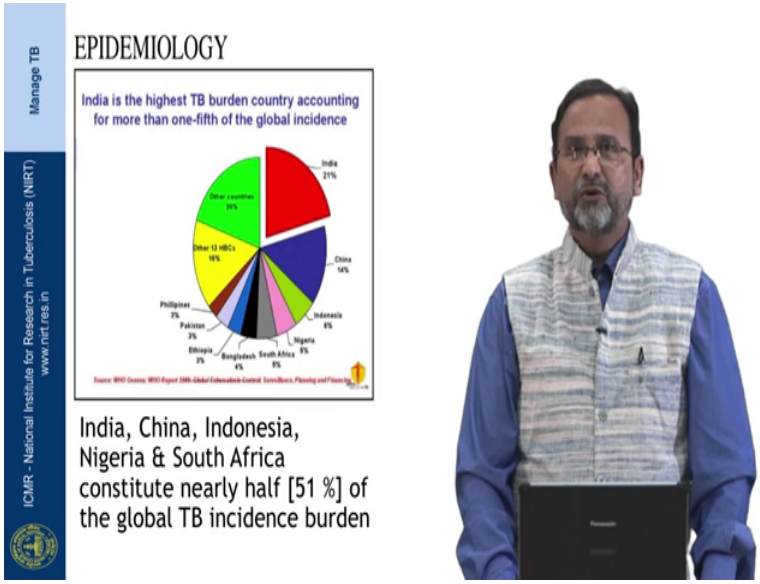

If you just look at the global burden; the red piece year or the red part of the pi that we see here is what India is contributing to the global disease burden and as you can see its nearly one-fifth of the total global burden followed by China, Indonesia, Nigeria and South Africa and together these 5 countries contribute to something like 51 percent of the total tuberculosis incidence disease burden.

I need to explain to you incidence means new cases of tuberculosis so these 5 countries are the most which are contributing to nearly half of the new cases that are happening or appearing all over the world.

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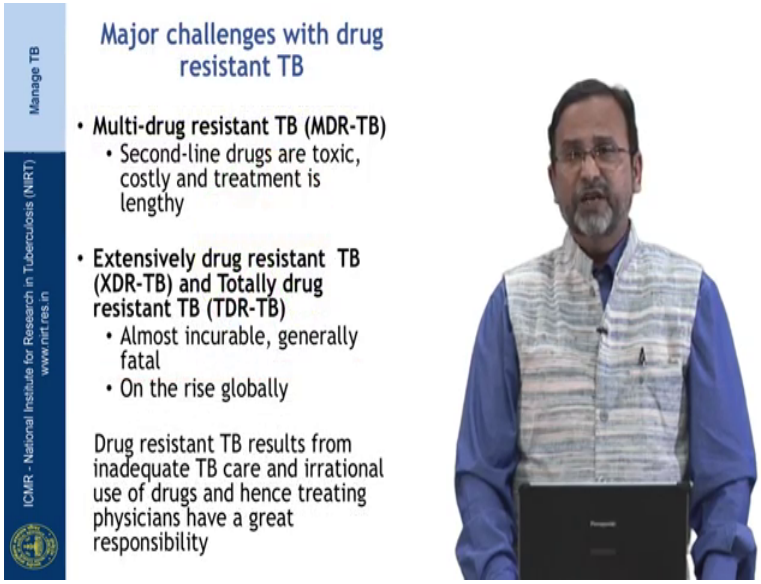

There is a challenge which is emerging because of this problem of drug resistance tuberculosis. Multidrug resistance of tuberculosis is the primary stage where the patients develop resistance to one or more drugs one or two primary line drugs which are used in the treatment of a tuberculosis.

Here the problem is the patients have to be shifted to the second line of treatment which the drugs are where the drugs are more toxic, they have more side effects, they are costly and treatment is much lengthier compared to the primary drug regimen.

So, that itself is the problem, but that gets further complicated in if patients develop Extensively drug resistance tuberculosis abbreviated as XDR and Total drug resistance tuberculosis as TDR as you can imagine they just take out take away all the weaponry that we have available to treat the tuberculosis and that is the reason why death rates following the development of XDR-TB or TDR-TB are quite huge and they are rising globally that is the point of great concern.

But what we have to understand that drug resistant tuberculosis mainly occurs as a result of inadequate TB care, inappropriate consumption of drugs and irrational use of drugs. So, some of these factors are related to the patients, some of these factors are related to the treating physician and hence we as treating physicians have a much greater responsibilities here.

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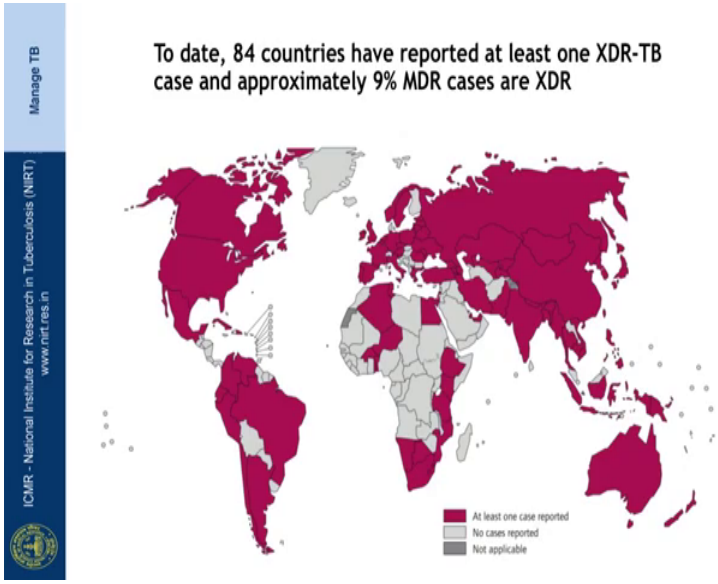

This slide is just to show you that the whole world if we just see today that there are 84 countries in the world that have reported at least one XDR-TB or extensively drug resistant case of tuberculosis and of these nine percent are MDR cases as well.

What is important to understand that all those areas that are non-red it is not necessary that they do not have cases of multi drug resistant tuberculosis; probably this is where they are not looking for cases of multi drug resistant tuberculosis at this point of time and no or no reliable data is available from this country. The take home message is multidrug resistance and extensively extensive drug resistance both are common and they have now appearing all around us.

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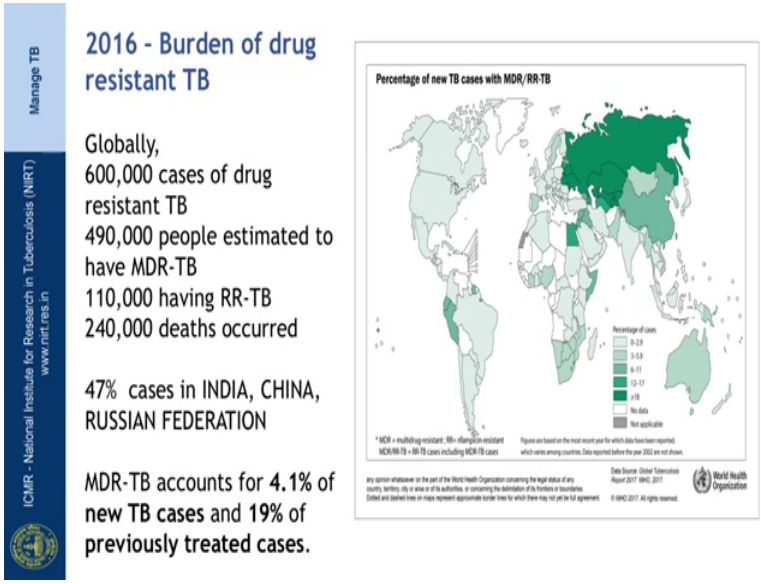

If you just look at this burden here; globally it has been estimated that there would be nearly 600000 drug resistance cases of these nearly 500000 could be due to MDR-TB or multi drug resistant tuberculosis nearly 110000 of these have Rifampicin resistance tuberculosis this is of point of great concern again, because rifampicin is the most important drug in the treatment of tuberculosis today and nearly 240000 deaths occur in this particular population.

What is again most important to see here in this map on the right side of the screen is you look at the portions of China look at the portions of Federation of Russia and India they constitute to something like 47 percent of the total cases of drug resistance reported from different parts of the country.

So, that something which we have to clearly understand the problem is very much there and we have to face it head on.

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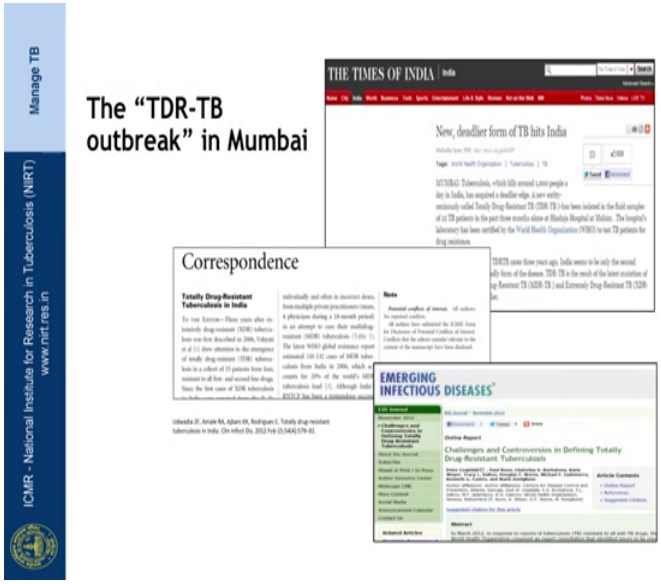

If you just look at what is happening in our own country this particular this sum of this reports which are flashing on the screen just talk about the fact how people have noticed in Mumbai large number of cases of even total drug resistance against tuberculosis.

People are worried; we the people in public health people as program managers and policy makers are very worried because these are the cases we probably are never going to cure. So, it really is important for us that we do not let people go to this particular stage and we do not allow MDR, XDR or TDR to develop at all.

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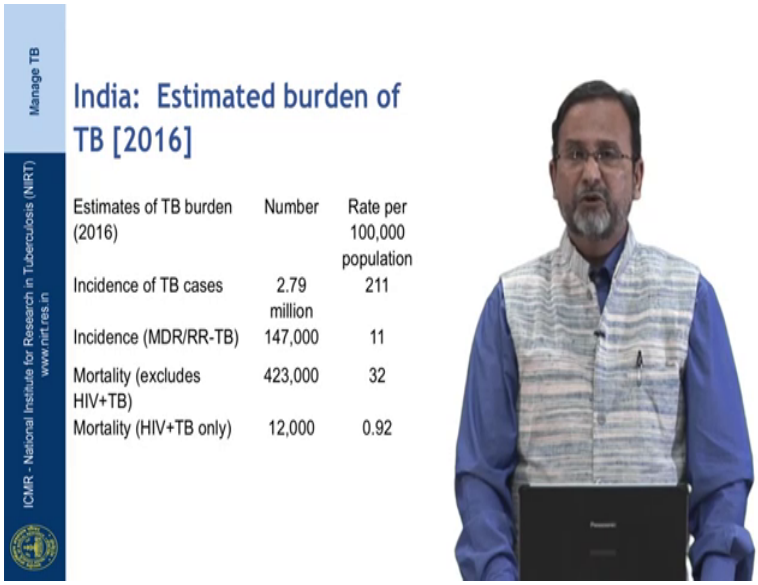

If we just look at the burden of a tuberculosis in our own country as it is seen in the year of 2016 nearly 2.7, 2.8 million TB infected people are estimated to be there in India with the rate of nearly 211 per 100000 population and among those if we just look at the resistance rifampicin resistant TB cases the amount to 11 per 100000 the death rates or which include HIV plus or TB infections is closed to 32 per 100000 and mortality due to HIV and TB together is 0.92 per 100000

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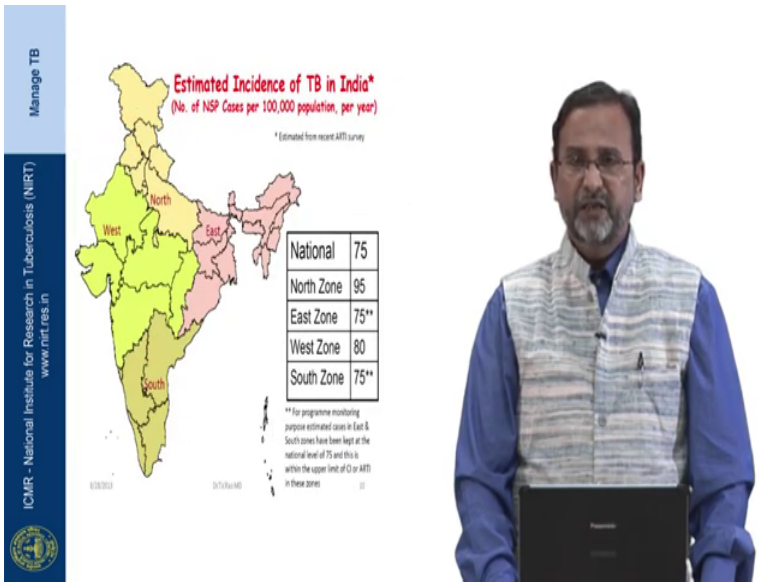

So, basically all these figures to indicate very clearly that this is a very very serious problem in our country. If you just look at the India map here and if you also look at the table on the right side simultaneously; what it primarily brings out is the fact that the north India and western India where the rates per 100000 population per year it is the occurrence of new TB cases.

In northern India and in western India the rates are high and in eastern zone and southern zone they are also high, but not as high as the northern and western regions, but the gap seems to be very narrow and we have to therefore, cant very clearly distinguish between the different regions of India as far as tuberculosis is concerned and we have to consider the overall heavy epidemic going on in different parts of the country.

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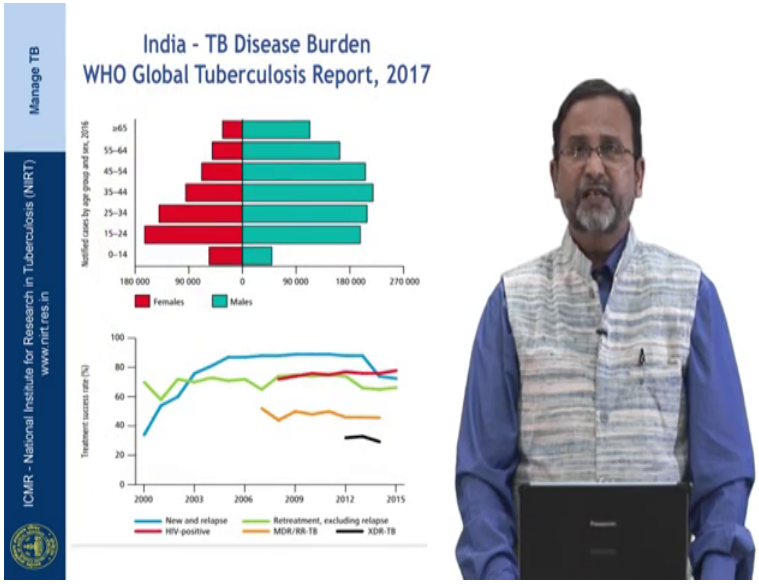

As far as the sex ratio is concerned; the males are more commonly diagnosed with tuberculosis than females, but we have to understand that access to care for women in our country is a huge problem and that may be one reason why we are seeing less number of cases diagnosed in women.

Regarding the various trends that we see this is the graph on the lower side shows various trends over a period of time; the new cases which are getting diagnosed steadily increasing for the last 15 years or so. The drug resistance slightly going down in the recent times this is what we observed, but we have this data which is available only in scanty populations not a full countrywide data.

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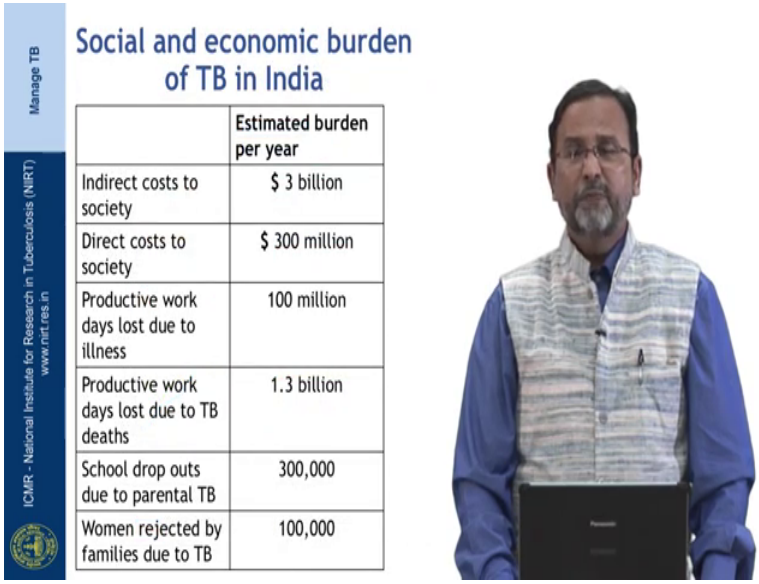

Talking about the burden of the disease; if we just look at the economic burden and a social burden that this disease causes on as it causes tremendous indirect and direct cause to the society. The indirect cause are believed to be 3 billion, but the direct cause are 100 times that of the indirect cause which is close to 300 million US dollars it is so very difficult to calculate how that will get converted into Indian rupees.

Just a phenomenal money which is being spent by people who are affected with tuberculosis and that is one of the reasons for that is the lack of productivity which you can see here; actually many people because of the illness are not able to work and earn money and that is the reason why there is a lot of out of pocket expense also happening as a part of the disease, generally poverty sets in.

If this happens in children you can also see that there are school dropouts, which are and that are they are not necessarily due to tuberculosis in children role, but may be due to parental TB also and that contributes a lot. Also sometimes women face rejection from their own families after they suffer from tuberculosis and these instances are also pretty high. So, in general there is there seems to be a lot of stigma attached to this particular thing, there is a huge economic burden which is which is caused because of that and huge amount of out of pocket expenses.

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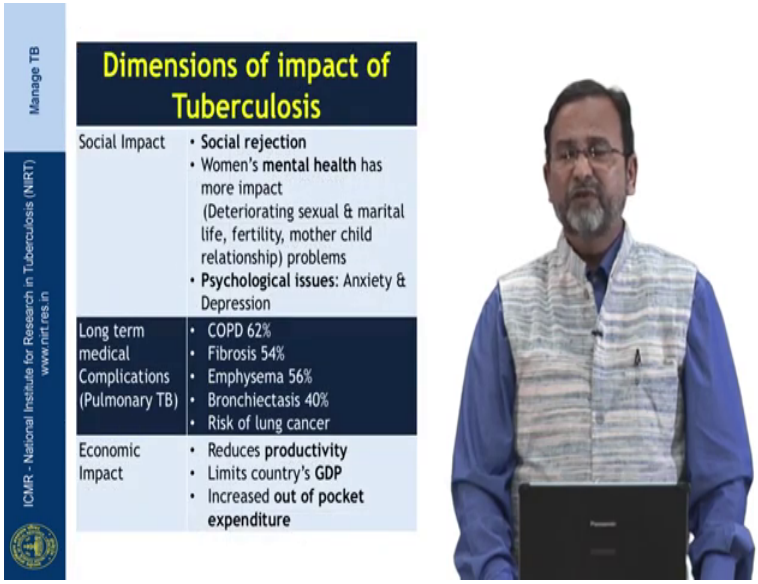

If we look at various dimensions of this particular impact the diseases causing on human beings; if we talk about the social impact I already talked about this social rejection part of it.

How mental health of people who are suffering from tuberculosis gets affected, sometimes the treatment can be very challenging, drug side effects become unmanageable and that is when frustration sets in and people start getting mentally affected here. Particularly when they do not get required family support and that is why even sometimes psychological issues like anxiety and depression also set in.

This highlights; the need for a woman tremendous family support as well as additional counseling support from professional agencies. Not only the social impact, but TB also has a huge medical impact as well; this people do suffer from chronic obstructive pulmonary disease in early 62 percent of the patients, lung fibrosis and 54 percent of the patients, emphysema in 56 percent, bronchiectasis 40 percent; all these are difficult chronic diseases very hard to control very hard to treat also there is a risk of lung cancer.

So, together in addition to social and long term medical complication there is a economic impact as well due to loss of productivity and this in some countries with very high TB burden the even the gross domestic product of those countries has gone down. The I did mention that out of pocket expenditure also is an important reason why there are why it leads to poverty.

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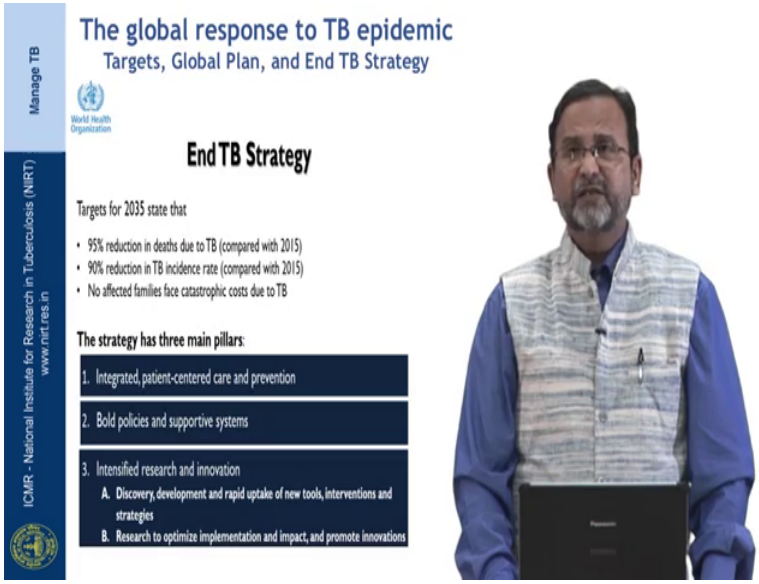

With all this at global level some thinking happened when people started acting or deciding to act very rigorously and that is how this end tuberculosis strategy got developed.

So, this is a strategy where the targets that have been decided for the year 2035 they include 95 percent reduction in deaths due to tuberculosis a 90 percent reduction in TB incidence that is a new cases occurring due to tuberculosis and no families to suffer from catastrophic expenses these are difficult targets, extremely difficult targets particularly from the growing for the growing economies or middle income countries, lower income countries.

And the strategies that basically form the core to achieve this include an integrated approach for care and prevention, it also talk think or suggest that some bold policies and decisions need to be taken, systemic improvement is really required. In addition to that a research and innovation should focus on bringing in new tools which are diagnostic tools, treatment options also prevention options like vaccines.

In addition to that various strategies that are available with us they need to be also advanced in a systematic way. Directly observed therapy supervised is the mainstay of TB treatment as all of us are aware that needs to be expanded, then we have to address the problem of a tuberculosis and HIV co-infection as well as MDR, XDR and separately and more aggressively. We have to strengthen our health systems to diagnose the cases as

early as possible, minimize the delays in putting people on treatment, ensuring that the people adhere to the treatment and not lost the treatment and get the referral care as and when necessary. So, it will be important to engage all kinds of care providers including the private sector. And we have to also empower people with tuberculosis and communities.

Generally to make an enabling environment which will promote research on tuberculosis which will bring in new tools and treatment options.

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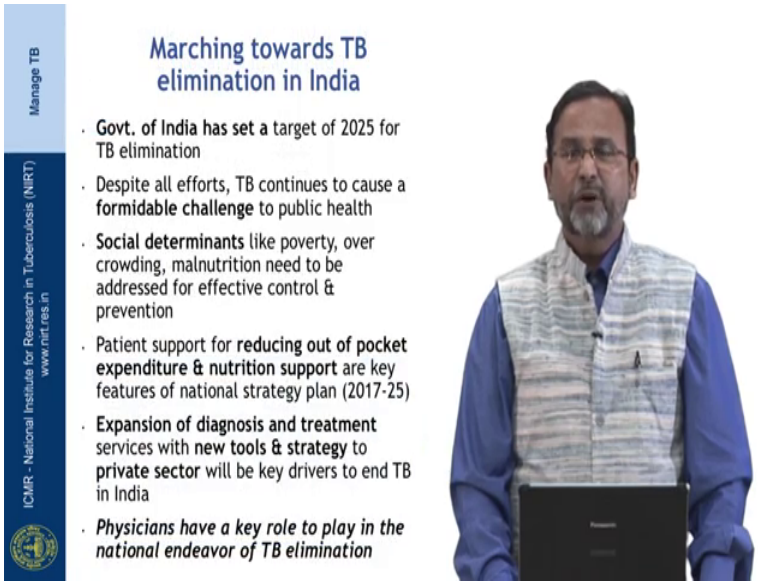

So, talking about India we have set a target of a TB elimination by 2025 we know that despite of despite all our efforts that we have been doing TB continues to pose a very formidable challenge for all of us and to the whole public health systems in general. Large number of social determinants which drive this particular epidemic in India including poverty, overcrowding, lack of adequate housing, malnutrition etcetera and they have to be addressed for effective control and prevention as well.

The patients support needs strengthening as well; basically the out of pocket expenses which families have to spend these are both for the drugs, for the loss of income as well as the nutritional aspect some provisions need to be made to support these families and we need to also expand our diagnosis and treatment network with services being made available with newer tools and strategies. Needless to say we as physicians have to make

ourselves very well aware of this particular challenge of tuberculosis and we have to play the key role as much in this whole national endower of TB elimination.

Thank you very much for your attention.