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A new edge to the fight against tuberculosis

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Why in News: At the One World TB Summit in Varanasi, Uttar Pradesh in March, 2023, Prime Minister Narendra Modi instilled fresh energy to the global tuberculosis (TB) elimination response and reiterated India's commitment to spearhead this effort. He further emphasised the importance of innovation and the need to "find new ways and formulate new strategies" to achieve the desired outcomes. The Prime Minister's remarks are critical as we look to redefine India's and the world's TB elimination response — with innovation and research being central drivers of change.

India's TB Burden

The Ministry of Health and Family Welfare has taken note of the WHO Global TB Report 2022, released on October 27, 2022 and has clarified that India has, in fact, performed far better on major metrics as compared to other countries over time.

India's TB incidence for the year 2021 is 210 per 100,000 population – compared to the baseline year of 2015 (incidence was 256 per lakh of population in India); there has been an 18% decline which is 7 percentage points better than the global average of 11%.

These figures also place India at the 36th position in terms of incidence rates (from largest to smallest incidence numbers).

Over the last few years, India has made significant progress in its efforts to end TB. India's National TB Elimination Programme, or the NTEP (previously known as the Revised National Tuberculosis Control Programme, or RNTCP), has introduced several measures to find, notify and treat TB cases, with case notifications rising from 15.6 lakh in 2014 to over 24 lakh in 2022. This reflects the programme's expanded reach and improved detection measures.

Performance analysis of India's measures against TB

While the COVID-19 pandemic impacted TB Programmes across the world, India was able to successfully offset the disruptions caused, through the introduction of critical interventions in 2020 and 2021 – this led to the National TB Elimination Programme notifying over 21.4 lakh TB cases – 18% higher than 2020.

This success can be attributed to an array of forward-looking measures implemented by the Programme through the years, such as the mandatory notification policy to ensure all cases are reported to the government.

Further, intensified door-to-door Active Case Finding drives to screen patients and ensure no household is missed, has been a pillar of the Programme.

In 2021, over 22 crore people were screened for TB. The aim has been to find and detect more cases to arrest onwards transmission of the disease in the community which has contributed to the decline in incidence. For this purpose, India has also scaled up diagnostic capability to strengthen detection efforts.

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Indigenously-developed molecular diagnostics have helped expand the reach of diagnosis to every part of the country today. India has over 4,760 molecular diagnostic machines across the country, reaching every district.

Further, novel approaches including engagement with the private sector, launch of social support provisions and introduction of diagnostic tools and new drug regimens, have improved TB management.

However, while these efforts have been commendable, lack of widespread awareness about the disease and lack of access to quality care continue to be a challenge. The recent National TB Prevalence Survey (in India) found that 64% of people with infectious TB did not seek care.

As a result, national-level estimates suggest that for every person notified with TB, we miss detecting almost two more cases.

Need for new approach to fight against TB

To address this challenge and truly bring transformative change in our TB response efforts, we will need to introduce disruptive approaches and new tools to change the way we prevent, diagnose, and treat TB.

India has long recognised the importance of investing in health research and development, especially in recent years.

The Mission COVID Suraksha programme to develop vaccines was a good example of a public-private partnership, with clear goals and outcomes. The huge number of diagnostic tests developed and a variety of different vaccine platforms show that our manufacturing sector is robust and can scale rapidly.

It is also heartening to see the establishment of centres of excellence, which will facilitate collaboration between Indian Council of Medical Research laboratories and the private sector.

It is possible, therefore, to strengthen and expand research and development efforts for TB, to develop new tools that will help India (and other developing countries) meet the End TB targets.

Suggested measures

Prioritise TB vaccine trials

First, for any infectious disease, a vaccine is what makes elimination possible. We do have the Bacille Calmette-Guérin (BCG) vaccine for TB, but it does not adequately protect adolescents and adults who are at the highest risk for developing and spreading TB.

While COVID-19 vaccines were developed within a year, we must prioritise and pick up the pace to find an effective TB vaccine.

There are currently over 15 TB vaccine candidates in the pipeline; we must ensure that their clinical trials are prioritised to assess their efficacy in various community settings and for different target groups.

Affordable diagnosis and testing

Second, testing for, and diagnosing TB needs to become more accessible and affordable so much so that each person with suggestive symptoms or frontline worker can test and get results within minutes, at minimal costs.

Point-of-Care Tests (POCTs), such as home-based tests for COVID, allowed decentralised, rapid and low-cost diagnostics to provide results within minutes.

New innovations such as nasal and tongue swab-based tests for TB can be a game changer by reducing diagnostic delays.

Further, handheld digital x-ray machines (with artificial intelligence-based software) can now be taken to villages and urban settlements to screen large numbers of high risk individuals, safely and conveniently.

Innovation in Drugs discovery

Third, the development and introduction of new therapeutic molecules can play a crucial role in the long run.

While we continue to invest in drug discovery, we must also scale up newer and more effective regimens and also dip into our armoury to re-purpose existing drugs for TB.

Shorter, safer, and more effective regimens do exist and include the 1HP regimen for latent TB infections, the four-month regimen (HPZM) for drug-susceptible TB, and the six-month regimen (BPaL/M) for drug-resistant TB.

The evidence on these regimens is clear; timelines for scale-up, however, have been too long.

Appropriate policy frameworks

Finally, part of the process of strengthening the innovation ecosystem also involves creating regulatory and policy frameworks that smoothen the rollout of proven tools to reach people with as little delay as possible.

This requires greater collaboration: not just between policymakers, scientists, product developers and clinical researchers across the country and even across regions, but potentially even between governments.

Harmonisation of standards and regulatory processes between countries can enable mutual recognition of evidence-based standards and licences and save critical time towards rollout.

Conclusion

The COVID-19 pandemic proved India's apt title: pharmacy of the world. Our scientific ingenuity during the pandemic has cemented our position as pioneers in innovation in the life sciences. In this spirit, we must create a strong platform that channelizes investments in research to bring in a paradigm shift at every stage of the TB care cascade — prevention, testing, and treatment. TB should no longer be the leading infectious disease killer globally, in the 21st century, and India can lead the way.