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 **The Indian EXPRESS**

Study identifies need to improve patient retention in the National TB Elimination Programme, highlights patients' trust relationship with private providers

Researchers found long delays in care access, with patients shuttling back and forth between providers and health sectors (private vs. public) before they are eventually enrolled on effective treatment.

Written by [Anuradha Mascarenhas](#) | Pune |
October 31, 2021 12:44:12 pm

Given the complexity of Multi Drug Resistance – Tuberculosis MDR-TB diagnosis and care, a new study sought to address key knowledge gaps in MDR risk factors, care delays, and drivers of delay to help guide disease control.

Researchers found long delays in care access, with patients shuttling back and forth between providers and health sectors (private vs. public) before they are eventually enrolled on effective treatment.

Additional evidence for recent transmission of drug-resistant TB in crowded localities/slum areas was also found, researchers said in their study "Tuberculosis Pathways to Care and Transmission of Multidrug-Resistance in India" published in a top ranked – American Journal of Respiratory and Critical Care Medicine on October 27 this year.

The research team, including Dr. Sachin Atre of Pune based D. Y. Patil Medical College and the Johns Hopkins Center for Clinical Global Health Education and Dr. Maha Reda Farhat,

Global TB Report App (WHO)



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assistant Professor of Biomedical Informatics at Harvard Medical School, Boston, USA.

"We believe these findings are of current interest to the Indian public given that [Covid-19](#) has further limited testing and diagnosis capacity for TB in India over the last 18 months," Dr Atre said.

Researchers conducted interviews with adults registered with the National TB Elimination Program (NTEP) for MDR (n=128) and non-MDR-TB (n=269) treatment to quantitatively and qualitatively study care pathways. The study conducted in 2018-19 was funded by Harvard-Dubai Centre for Global Health Delivery and it was done among patients who are registered with the National TB Elimination Control Program (NTEP) in Maharashtra.

They collected treatment records and GeneXpert-TB/RIF diagnostic reports. MDR-TB was associated with young age, and crowded residence. GeneXpert rifampicin resistance diversity was measured at 72.5%. Delay decreased with wider access to GeneXpert testing. Pathways to care were complex with a median of 4 providers. Of MDR-TB patients, 68% had their first encounter in the private sector and this was associated with a larger number of subsequent healthcare encounters and huge expenditures.

The association of MDR with young age, crowded locality and low genotypic diversity (means many patients have the same resistant TB strain which may cause an epidemic situation) raise concerns of ongoing MDR-TB transmission which is fueled by long delays in care.

Delays are decreasing with GeneXpert use, suggesting the need for routine use in presumptive TB and provision for that. The study identified the need to improve patient retention in the NTEP and highlight patients' trust relationship with private providers.



Central team finds TB death rate higher than national average in Karnataka's Ballari

The team noted that the death rate in the district at 7.2 per cent this year, which was more than the national average of 5 per cent.

By: [Express News Service](#) | Bengaluru |
Updated: October 30, 2021 10:43:59 am

A team of health experts from the Union Ministry of Health and Family Welfare has directed the Ballari district administration to take suitable measures to enhance community involvement after it found the district to be recording a tuberculosis (TB) death rate higher than the national average.

The team noted that the death rate in the district at 7.2 per cent this year, which was more than the national average of 5 per cent.

According to a note shared by the Department of Health and Family Welfare, the team noted that 247 people had died due to TB in the last nine months in Ballari district. While 3,407 persons were infected, 1,170 had recovered while another 1,789 persons were under treatment in various health facilities across Ballari (including talukas now named under the new Vijayanagara district).

Officials attributed the lesser number of deaths in 2021 as compared to previous years to restrictions related to lockdowns and precautions like wearing masks and maintaining social distance taken during the period. The fatalities recorded in 2019 and 2020 were 451 and 372, respectively.

Meanwhile, State Joint Director (TB) Dr Ramesh Chandra Reddy told [The Indian Express](#) that officials found that most deaths took place as

patients avoided seeking treatment during the initial stages.

“While developing a cough, most patients chose not to report it at their nearest health facility fearing that they might be diagnosed with [Covid-19](#) and will be shifted to Covid Care Centres. To tackle this, we have enhanced asymptomatic screening as well with Information, Education and Communication (IEC) initiatives in place now even at the gram panchayat and village levels to create awareness on the need to seek medical treatment faster,” he explained.

The team headed by Dr Tarak Shah visited the District Hospital (including NCD Clinic and TCC), VIMS Bellary (Medical College including DRTB Center, ART center, Truenat Lab facility), Sub-divisional hospitals – Hospet & Sandur, CHC-Thekkalakotte & Tornagallu, Chappardalli UPHC, and Gadiganur -PHC & HWC in Ballari.

The team also comprising Dr Suresh Shastri, Dr Shazia Wafai, Dr Gulfam Ahmed Hashmi, Dr Nischit, and Dr Devigan visited private facilities, including Adarsh Hospital, Pawan Health Clinic, Sanjivani Hospital and in Siruguppa-Madushashtra Chikitsalaya, and Jindal Sanjeevani Hospital in the district.

On collecting information from hospital authorities, patients and their relatives, the team found that most fatalities were reported in Ballari taluk (93) followed by Siruguppa (34) and Hospet (33).

Further, in a revised strategy to be followed for TB treatment, officials in Ballari and across Karnataka have been directed to admit patients to their respective medical facilities. “We will now take all measures to stabilise each patient before leaving him or her back to the community with continued medication. Issues like alcoholism and malnutrition that lead to cases worsening will be addressed directly at the village level itself,” Dr Reddy highlighted.

The central team has noted that the pending approval for PPSAs (Patient Provider Support Agencies) in the selected 12 districts in the state, and shortage of CBNAAT Cartridges and other lab consumables among major issues to be tackled.



Active COVID-19 cases in India lowest in 248 days

The cumulative vaccine doses administered in the country so far under the nationwide COVID-19 vaccination drive has exceeded 106.31 crore.

By: [PTI](#) | New Delhi |
November 1, 2021 11:45:54 am

With 12,514 people testing positive for [coronavirus](#) in a day, India's total tally of [COVID-19](#) cases rose to 3,42,85,814, while the active cases declined to 1,58,817, the lowest in 248 days, according to the Union Health Ministry data updated on Monday.

The death toll climbed to 4,58,437 with 251 fresh fatalities, according to the data updated at 8 am.

The daily rise in new coronavirus infection has been below 20,000 for 24 straight days and less than 50,000 daily new cases have been reported for 127 consecutive days now.

The active cases comprise 0.46 per cent of the total infections, the lowest since March 2020, while the national COVID-19 recovery rate was recorded at 98.20 per cent, the ministry said.

A decline of 455 cases has been recorded in the active COVID-19 caseload in a span of 24 hours.

The cumulative doses administered in the country so far under the nationwide COVID-19 vaccination drive has exceeded 106.31 crore.

The number of people who have recuperated from the disease surged to 3,36,68,560, while the case fatality rate was recorded at 1.34 per cent.

As many as 8,81,379 tests were conducted on Sunday taking the total cumulative tests conducted so far for detection of COVID-19 in the country to 60,92,01,294.

The daily positivity rate was recorded at 1.42 per cent. It has been less than two per cent for last 28 days. The weekly positivity rate was also recorded at 1.17 per cent. It has been below two per cent for the last 38 days, according to the ministry.

The cumulative doses administered in the country so far under the nationwide COVID-19 vaccination drive has exceeded 106.31 crore.

India's COVID-19 tally had crossed the 20-lakh mark on August 7, 2020, 30 lakh on August 23, 40 lakh on September 5 and 50 lakh on September 16. It went past 60 lakh on September 28, 70 lakh on October 11, crossed 80 lakh on October 29, 90 lakh on November 20 and surpassed the one-crore mark on December 19.

India crossed the grim milestone of two crore on May 4 and three crore on June 23. The 251 new fatalities include 167 from Kerala and 20 from Maharashtra.

Kerala has been reconciling Covid deaths since the past few days.

A total of 4,58,437 deaths have been reported so far in the country including 1,40,216 from Maharashtra, 38,082 from Karnataka, 36,116 from Tamil Nadu, 31,681 from Kerala, 25,091 from Delhi, 22,900 from Uttar Pradesh and 19,141 from West Bengal.

The ministry stressed that more than 70 per cent of the deaths occurred due to comorbidities

"Our figures are being reconciled with the Indian Council of Medical Research," the ministry said on its website, adding that state-wise distribution of figures is subject to further verification and reconciliation.



Zyklus Cadila agrees to reduce its Covid vaccine price to Rs 265 a dose, final decision soon: Reports

Zyklus Cadila's ZyCov-D is the first vaccine cleared by India's drug regulator for inoculation of those aged 12 years and above.

By: [PTI](#) | New Delhi |
October 31, 2021 5:04:44 pm



The three doses are to be administered 28 days apart, with each dose comprising a shot in both arms | Representational image

Zyklus Cadila has agreed to bring down the price of its [Covid-19](#) vaccine to Rs 265 a dose following persistent negotiations by the government but a final deal is yet to be reached, reports said on Sunday.

Zyklus Cadila's ZyCoV-D is the first vaccine cleared by India's drug regulator for inoculation of those aged 12 years and above.

To administer the needle-free vaccine, a disposable painless jet applicator costing Rs 93 is required for each dose, which would take the price to Rs 358 per dose.

The Ahmedabad-based pharma company earlier had proposed a price of Rs 1,900 for its three-dose regimen, sources said.

"The company has brought down the price to Rs 358 for each dose which includes Rs 93, the cost of a disposable jet applicator, following repeated negotiations by the government.... A final decision in the matter is likely to be taken this week," a source in the know of developments told PTI.

The three doses are to be administered 28 days apart, with each dose comprising a shot in both arms.

The indigenously developed world's first DNA-based needle-free Covid-19 vaccine ZyCoV-D received emergency use authorisation from the drug regulator on August 20.

Meanwhile, the government is still waiting for the recommendations from the National Technical Advisory Group on Immunisation (NTAGI) for introducing ZyCoV-D in the inoculation drive for adults and children with co-morbidities.

NTAGI will provide the protocol and framework for the introduction of this vaccine in the Covid-19 immunisation drive.

Official sources earlier had said that the pricing of ZyCoV-D would be different from that of [Covaxin](#) and Covishield as apart from being a three-dose vaccine, it requires a special pharma jet injector that has to be used for administering the vaccine.

That pharma jet injector can be used for administering around 20,000 doses.

"The jet applicator helps the vaccine fluid to penetrate the skin to enter cells of the recipient," the source said.

Zyklus Cadila can provide around two crore doses in November, a source had said.

The government is currently procuring two other vaccines — Covishield at Rs 205 per dose and Covaxin at Rs 215 per dose — for the national Covid-19 immunisation programme.

Covishield, Covaxin and Sputnik V are being given to only those above 18 years of age and unlike ZyCoV-D, these are two-dose regimens.



We trust Indian industry, Bharat Biotech has been submitting data regularly, very quickly: WHO official on Covaxin EUL

A technical advisory group of the UN health agency which met on Tuesday has sought "additional clarifications" from Bharat Biotech for Covaxin to conduct a final risk-benefit assessment for Emergency Use Listing of the vaccine.

By: [PTI](#) |

Updated: October 29, 2021 9:54:12 am

India's Bharat Biotech has been submitting data on the EUL of [Covaxin](#) regularly and very quickly to a technical committee which hopes to have a final recommendation to the WHO next week, a top official of the global health agency said on Thursday, stressing that the UN body "trusts" the Indian industry that manufactures high-quality

vaccines. Hyderabad-based Bharat Biotech, which has developed Covaxin, had submitted EOI (Expression of Interest) to the World Health Organisation on April 19 for the vaccine's Emergency Use Listing (EUL).



Covaxin displayed an efficacy of nearly 78 per cent in clinical trials. (File)

A technical advisory group of the UN health agency which met on Tuesday has [sought “additional clarifications”](#) from Bharat Biotech for Covaxin to conduct a final risk-benefit assessment [for Emergency Use Listing of the vaccine.](#)

“Let me say that Bharat has been submitting data regularly and very quickly, but they submitted the last batch of data on the 18th of October, Dr Mariangela Simao, Assistant Director-General, Access to Medicines and Health Products at WHO, said at a press briefing in Geneva. She was responding to a question on the delay in granting the Emergency Use Listing to Covaxin while Chinese vaccines Sinopharm and Sinovac were given approval even with lack of data. Simao said that when the technical advisory group met on October 26 to discuss the EUL for Covaxin, they asked Bharat Biotech for additional clarifications. The technical advisory group will reconvene on November 2 for the final risk-benefit assessment of Covaxin EUL.

She said WHO is in touch with Bharat Biotech and has “daily conversations and calls and meetings clarifying what additional data needs” to be submitted to the technical expert group. “Let me

just clarify and without wanting to mention any specific manufacturer but saying that we have assessed an Indian manufacturer earlier in the year and it took 30 days, she said, a reference to the Serum Institute of India which manufactures the AstraZeneca Covishield vaccine.

“So this is not about moving quicker with one or another vaccine. We really trust the Indian industry. India produces the different majority of vaccines in the world, high-quality vaccines. We are right now at the last stage of the assessment by this external advisory group and we hope to have a final recommendation to the WHO next week. I hope that’s well understood. She said that it is important to highlight that the process that WHO uses for issuing the Emergency Use Listing is a very transparent process and there are no secrets involved except for any confidential information.

“Everything else, the procedures that WHO uses, are independent of which country is manufacturing the vaccine, she said, adding that the process is based on the best international standards available. Simao also noted that sometimes WHO needs to inspect the manufacturer, if it hasn’t done an inspection in the recent term. “It wasn’t the case of Bharat. We did not need to inspect Bharat, she said, adding that once the manufacturer has completed submitting all the data to WHO, it is put through for assessment by an external Technical Advisory Group, which comprises experts from six different nationalities and they look at all the data that has been collected by WHO, provided by the manufacturer in recommending the Emergency Use Listing.

She noted that in the case of the two Chinese vaccines also, the group had asked for additional clarifications and the entire process was followed to assess the Chinese vaccines. One of the Chinese vaccines was issued Emergency Use Listing one month after the first technical advisory group meeting, while the

second vaccine was given EUL after six weeks, she said. Simao noted that at the moment, including Bharat Biotech's Covaxin, WHO is assessing eight vaccine candidates. She said Bharat Biotech started the rolling submission on July 6. We are treating this as a very urgent matter and we have teams working seven by seven on the topic.

Responding to the Covaxin question, Dr Bruce Aylward, Senior Advisor to WHO Director-General Dr Tedros Adhanom Ghebreyesus, said that in the stressful situation we are all working under in this pandemic, it is so important that we're accurate in the information that we use and that we share. And we just want to highlight, be on the record, that there were a number of inaccuracies in the way the issue was presented. He added that the actual information about the EUL dates, the process is all available transparently on the WHO website.

We're committed at the organisation from the very top under the Director-General to move these processes as rapidly as possible. But let's be very clear, the timeline for EULing a vaccine depends 99% on manufacturers, the speed, the completeness with which they can get data to the independent groups that assess for WHO. We just want to be very, very clear on that point. Aylward added that WHO's job is to save as many lives as possible and as fast as possible. This includes ensuring no product lies unused.

While the organisation does everything, he said, we need manufacturers, the regulator agencies, others we work with to make sure they have the information they need to make those determinations. We need to make sure the products are safe and effective and produced to the right quality. And that takes a little bit of time, but it's in the interest of global safety. WHO Chief Scientist Soumya Swaminathan said that one of the reasons for the high amount of stress that people who've received vaccines that are not yet approved, either by WHO or by any of

the other main stringent regulatory agencies, is because of restrictions in travel that have been imposed.

She reiterated that the emergency committee that reviews the International Health Regulations met again last week and underlined their previous recommendations that countries should not use vaccination status or selective vaccination status as the sole criteria for entry for travel. Bharat Biotech's Covaxin and AstraZeneca and Oxford University's Covishield are the two widely used vaccines in India. The WHO has so far approved Covid-19 vaccines of Pfizer-BioNTech, AstraZeneca-SK Bio/Serum Institute of India, Johnson & Johnson-Janssen, Moderna, and Sinopharm for emergency use.



Fully vaccinated people as likely to spread Delta variant as unvaccinated: Study

According to a UK study published on Thursday in the Lancet infectious diseases journal, people who have received two doses of a Covid-19 vaccine have a lower, but still appreciable, risk of becoming infected with the delta variant when compared to the unvaccinated.

By: [Express News Service](#) | Pune |
Updated: October 29, 2021 12:04:30 pm

People inoculated against [Covid-19](#) are just as likely to spread the [delta variant](#) of the virus to contacts in their household as those who haven't taken their shots, a new research has revealed.

According to a UK study published on Thursday in the Lancet infectious diseases journal, people who have received two doses of a Covid-19

vaccine have a lower, but still appreciable, risk of becoming infected with the delta variant when compared to the unvaccinated. Vaccinated people clear the infection more quickly but the peak viral load among them is similar to people who haven't got their jabs.



Vaccines remain highly effective at preventing severe disease and deaths from Covid-19, but some studies suggest they may be less effective against the delta variant. (File Photo)

Vaccines remain highly effective at preventing severe disease and deaths from Covid-19, but some studies suggest they may be less effective against the delta variant — the current dominant strain worldwide — though the reason for this has not been established yet. Most Covid-19 transmission is known to occur in households, yet there is limited data on the risk of transmission of the delta variant from vaccinated people with asymptomatic or mild infections in the community.

Professor Ajit Lalvani of Imperial College London, UK, who co-led the study, said: "Vaccines are critical in controlling the pandemic as we know they are very effective at preventing serious illness and death. However, our findings show that vaccination alone is not enough to prevent people from being infected with the delta variant and spreading it in the household settings. The ongoing transmission we are seeing between vaccinated people makes it essential for unvaccinated people to get vaccinated to protect themselves from acquiring infection and severe Covid-19, especially as more people will

be spending time inside in close proximity during the winter months. We found that susceptibility to infection increased already within a few months after the second vaccine dose. So, those eligible for a Covid-19 booster shot should get them promptly."

The new study included 621 participants, identified by the UK contact tracing system, and was carried out between September 2020 and September 2021. All participants had mild Covid-19 illness or were asymptomatic. Demographic and vaccination status information were collected on enrolment, and participants had daily RT-PCR tests to detect infection, regardless of whether or not they had symptoms. This is one of the few studies that have been carried out using such detailed data from real households, offering key insights into how vaccinated people can still be infected with the delta variant and pass it on to others.

In this study, participants were defined as unvaccinated if they had not received a single Covid-19 vaccine dose at least seven days before enrolment, partially vaccinated if they received one dose more than seven days before enrolment, and fully vaccinated if they received two doses more than seven days before taking part in the study.

Risk of transmission based on vaccination status was analysed for household contacts exposed to delta variant index cases (the first detected case in a household). By performing tests on swab samples provided daily by each participant for 14–20 days, changes over time in viral load — the amount of virus in a person's nose and throat — were estimated by modelling PCR data, enabling comparisons between fully vaccinated cases of delta infection, and unvaccinated cases of delta, alpha, and pre-alpha infection.

A total of 205 household contacts of delta variant index cases were identified, of whom 53

tested positive for Covid-19. Of the 205 contacts, 126 (62%) were fully vaccinated, 39 (19%) had received one dose, and 40 (19%) were not vaccinated. Among household contacts who had received two doses, 25% (31/126 contacts) became infected with the delta variant compared with 38% (15/40) of unvaccinated household contacts.

Among vaccinated contacts infected with the delta variant, the median length of time since vaccination was 101 days, compared to 64 days for uninfected contacts. This suggests that the risk of infection increased within three months of receiving a second vaccine dose, likely due to waning of the protective immunity.

133 participants had their daily viral load trajectories analysed, of whom 49 had pre-alpha and were unvaccinated, 39 had alpha and were unvaccinated, 29 had delta and were fully vaccinated, and 16 had delta and were unvaccinated. Viral load declined more rapidly among the vaccinated people infected with the delta variant (0.95 log₁₀ virus copies/mL/day) compared with unvaccinated people with delta (0.79), alpha (0.82), or pre-alpha (0.69). However, the authors noted that vaccinated people did not record a lower peak viral load than unvaccinated people, which may explain why the delta variant can still spread despite vaccination as people are most infectious during the peak viral load phase.

Dr Anika Singanayagam, the co-lead author of the study, said, "Understanding the extent to which vaccinated people can pass on the delta variant to others is a public health priority. By carrying out repeated and frequent sampling from contacts of Covid-19 cases, we found that vaccinated people can contract and pass on the infection within households, including to vaccinated household members. Our findings provide important insights into the effect of vaccination in the face of new variants, and specifically, why the delta variant is continuing

to cause high Covid-19 case numbers around the world, even in countries with high vaccination rates. Continued public health and social measures to curb transmission – such as masking, wearing, [social distancing](#), and testing – thus remain important, even in vaccinated individuals."



Centre allotted 1.40 crore vaccines to Tamil Nadu for November: Minister

The increase in the monthly allotment by the Centre follows the performance of the department in vaccination over the last few months, the Minister for Medical and Family Welfare said here.

By: [PTI](#) | Chennai |
October 31, 2021 1:01:20 pm



Beneficiaries get a blood pressure check before being administered the COVID-19 vaccine at the Government Omandurar Medical College Hospital, in Chennai. (PTI)

Tamil Nadu Minister Ma Subramanian on Saturday said the Centre has allotted 1.40 crore [Covid-19](#) vaccines to the State for November and appealed to members of the public to take part in the vaccination camps being conducted by the Health Department.

Tamil Nadu inoculates 17.14 lakh in 7th mega Covid vaccination drive

A total of 6,26,955 people received the first shot while 10,87,156 people received the second, a press release said.

By: [PTI](#) | Chennai |

Updated: October 31, 2021 12:55:47 pm

Tamil Nadu inoculated 17,14,111 people against [Covid-19](#) in the seventh mega vaccination drive conducted across the state on Saturday, the health department said.

A total of 6,26,955 people received the first shot while 10,87,156 people received the second, a press release said.

The earlier camps were held on September 12, 19, 26 and on October 3, 10, and 23.

Minister for Medical and Family Welfare Ma Subramanian inspected the vaccination drive that was conducted in over 32,205 camps between 7am and 7pm in places like primary health centres, government hospitals and schools.

Among districts, Chennai topped the list by vaccinating 1,52,849 people followed by Villupuram 1,05,694 and Cuddalore 98,619 while Mayiladuthurai recorded the least with 10,872.

In view of the vaccination today, there would not be any special camp on October 31, the release said.

The increase in the monthly allotment by the Centre follows the performance of the department in vaccination over the last few months, the Minister for Medical and Family Welfare said here.

Stating that the Centre has been sending sufficient vaccines to the State, Subramanian said there was demand for vaccines in May, June and July.

“Following the Tamil Nadu government's performance and based on the request by Chief Minister (M K Stalin), the Union government enhanced the allotment of vaccines for September, October and November,” he said.

In September, over and above the monthly allotment of 1.04 crore doses, an additional 43 lakh vaccines were released by the Union government and the doses were increased by three lakh to the allotted 1.22 crore for October, he said.

“For November, based on the request by the Chief Minister, 1.40 crore doses have been allotted,” he told reporters.

The Minister requested the people to extend their cooperation towards ensuring Tamil Nadu as the first State to vaccinate 100 per cent of its population with the first dose and 50 per cent with the second dose by November-end.

Stating that the third wave of Covid-19 was posing a threat to countries like the United States, China, Russia and Singapore, Subramanian appealed to everyone to come forward to get inoculated since vaccination camps have been set up closer to the residential areas for the convenience of the public.

Till date 5.73 crore people in the State have been inoculated. Of this, 70 per cent have received the first dose while 29 per cent of them the second dose, he said.

Explained: Should I mix or match my Covid-19 booster shot?

Here's a look at the science behind mix-and-match boosters and some advice from the experts to help you decide.

By: [New York Times](#) |
October 30, 2021 1:58:11 pm

Written by **Tara Parker-Pope**

Deciding which booster shot to get can feel a lot like a choose-your-own-adventure book — you've got three options, but don't have a clue which one leads to the best outcome.

The Food and Drug Administration recently authorized a mix-and-match booster shot strategy that now allows eligible adults to pick a booster from one of three [Covid-19](#) vaccines — Pfizer-BioNTech, Moderna or Johnson & Johnson — even if it's different from the one they initially received.



A medical worker prepares a shot of the Moderna vaccine during a vaccination campaign at Saint Damien Hospital in Port-au-Prince, Haiti. (AP Photo/Joseph Odelyn, file)

But many people are confused about whether they should switch vaccines for the booster dose or stick with the one they know. And if they do

decide to mix and match, which one should they choose?

Public health officials have declined to recommend a specific shot, leaving it up to individuals to decide. So what should you do? Here's a look at the science behind mix-and-match boosters and some advice from the experts to help you decide.

Why did experts approve mixing and matching of booster shots?

One reason is convenience. Since the goal is to get as many people vaccinated as possible and help vulnerable people get boosters quickly, the expert committees authorized the mix-and-match strategy. This means if you've had Johnson & Johnson or Moderna, but the local pharmacy is only offering Pfizer, you can get whatever shot is available without delay.

But the committee was also following the science. Early studies have shown the mix-and-match strategy not only is safe and effective, but that mixing vaccines also can sometimes create a broader, more potent response than getting multiple doses of a single vaccine.

Why isn't a specific booster shot recommended?

The scientific studies didn't show a clear winner, but did show that all the booster shots offered strong antibody response no matter what the combination.

"Part of the beauty of the mix and match is it enables people no matter where they are — rural or in the city — to have a choice," said Dr. Kirsten E. Lyke, a professor at the University of Maryland School of Medicine who presented early results of a booster shot trial to the F.D.A. vaccine panel. "They're all safe, they're all going to give you a boost, and they're all going to protect you against severe disease and death."

So what did the studies show?

It depends on which set of studies you consider. In June, the National Institutes of Health began its own study looking at what happens when people fully vaccinated with Pfizer, Moderna or Johnson & Johnson get a booster of the same vaccine or switch to a new one. The study looked at nine different combinations of vaccines and boosters, with 50 volunteers in each group.

Early results looked at neutralizing antibodies, which are the specific antibodies that stop the virus and protect you from getting sick. All the booster shots stimulated a neutralizing antibody response, but there were differences. Those who received the Moderna vaccine for their first two doses and Moderna as a booster had the highest antibody levels. Second place went to people who got two doses of Pfizer, followed by Moderna.

But it's important to note that the small study groups weren't designed to compare which shot was best, and the first studies used a full dose (100 micrograms) of Moderna, and not the half dose that has been approved. It's possible that differences in the study subjects led to the difference in results. And while the difference in antibody levels sounds impressive, it's probably not all that meaningful in terms of protecting you in the real world.

The biggest differences in antibody levels were seen in the Johnson & Johnson recipients, who showed a fourfold rise in neutralizing antibodies after the J.&J. booster, but had a 76-fold rise after the Moderna booster and a 35-fold increase after a Pfizer booster.

Does that mean if I had Johnson & Johnson, I should definitely switch to Moderna or Pfizer?

Not necessarily. For J.&J. recipients, who initially would have received a single dose, there's another study to consider. This one included

30,000 people and looked at overall protection from the [coronavirus](#). That study found that a second dose of J.&J., at least two months after the first, resulted in 94 percent protection against mild to severe cases of Covid-19.

What's intriguing about the Johnson & Johnson vaccine is that it appears to trigger a different part of the immune system, stimulating not just neutralizing antibodies but also T cells, possibly resulting in more durable protection. The N.I.H. study will eventually look at T-cell response following the various booster shot combinations, but the data aren't available yet.

So how should I decide which one to pick?

All the booster shots stimulate the immune system, so the answer about which shot to get depends on your priorities and personal risk. Here are some examples to help you decide.

Talk to your doctor: Depending on your personal health circumstances — whether you have underlying health problems, or are prone to blood clots or heart problems, or have been undergoing [cancer](#) treatment — your physician might have an opinion about which shot is best for you. Different vaccines, for example, have different possible side effects.

Convenience: If you just want convenience, pick the shot that's easiest to get. My 80-year-old mother-in-law, who lives in New Mexico, originally got the Johnson & Johnson shot because that's what was offered in the small village where she lives. Her plan is to get whatever is offered by her local provider because finding a different shot would require a long drive. My advice to her is to get whatever shot she can as soon as she can. It's probably going to be a Johnson & Johnson booster, which I know will give her more protection than she has now.

Concerns about risk: People who are particularly anxious about Covid-19 may decide to base

decisions about booster shots on preliminary research and pick Moderna, because of the early research showing it stimulates a higher level of neutralizing antibodies.

Familiarity: Some people may make decisions based on the experience they had with their first shot. They already know their body handled the first dose with no complications, so they may be inclined to pick the same vaccine for the booster shot.

Dr. Asaf Bitton, executive director of Ariadne Labs at Brigham and Women's Hospital and the Harvard T.H. Chan School of Public Health, said he's received a number of questions from patients about which shot to get. For patients who received Johnson & Johnson, he advises them to mix and match with Moderna or Pfizer, based on the preliminary study data showing a higher antibody response. But for patients who have received Moderna or Pfizer, which are mRNA vaccines, he suggests sticking with what you know if you didn't have any complications with the first two doses.

"The pragmatic side of me says if you got Pfizer and you did fine with that, then getting a booster of the same one makes sense," said Dr. Bitton. "To track down that pharmacy that has Moderna instead of Pfizer — is it worth it? I'm not convinced yet with the data we have that it is. Unless you find yourself only able to get one particular kind, I'd say stick with what you've got in the mRNA family."

Does it matter that the Moderna booster is only half a dose?

The N.I.H. study of booster shots is looking at whether there's a difference in response between those who received 100 microgram boosters of Moderna and those who received a 50 microgram dose. Those results aren't available yet, but it seems unlikely there will be much of a difference, if any, say experts.

How long does the booster last? Will I need another one soon?

There's not an answer to that question yet, but we'll find out in the coming months as scientists continue to study large groups of people who have been vaccinated and received boosters.

What is I'm not eligible for a booster yet?

Depending on how the current guidelines for boosters are interpreted, roughly 85 percent of the adult population already may be eligible. But while the evidence is clear that people who are older or immune-compromised can benefit from additional shots, the original vaccine doses are still doing a good job protecting people from serious illness and hospitalization. And it's important to remember that booster shots alone will not end the pandemic.

"The question is to what extent will this whole booster mania really affect this pandemic," said Dr. Paul A. Offit, the director of the Vaccine Education Center at Children's Hospital of Philadelphia. "Probably not much. If you're hospitalized with this virus it's not because you haven't gotten a third dose; it's because you haven't gotten any dose."



Active Covid-19 cases in India increase to 1,61,555; over 14k test positive in a day

By: [PTI](#) | New Delhi |
October 30, 2021 10:41:43 am

The daily rise in new coronavirus infections in India has been below 30,000 for 36 straight days

and less than 50,000 daily new cases have been reported for 125 consecutive days now.



A health worker collects swab sample of a resident for Covid-19 test, at Sion in Mumbai. (PTI/File Photo)

With 14,313 people testing positive for [coronavirus](#) in a day, India's total tally of [Covid-19](#) cases rose to 3,42,60,470, while the active cases were recorded at 1,61,555, according to the Union health ministry data updated on Saturday.

The death toll climbed to 4,57,740 with 549 more fatalities, according to the data updated at 8 am.

The daily rise in new coronavirus infections has been below 30,000 for 36 straight days and less than 50,000 daily new cases have been reported for 125 consecutive days now.

The active cases comprise 0.47 per cent of the total infections, the lowest since March 2020, while the national Covid-19 recovery rate was recorded at 98.19 per cent, the ministry said.

An increase of 221 cases has been recorded in the active Covid-19 caseload in a span of 24 hours. The number of people who have recuperated from the disease surged to 3,36,41,175, while the case fatality rate has increased to 1.34 per cent.

The daily positivity rate was recorded at 1.22 per cent. It has been less than 2 per cent for the last 26 days. The weekly positivity rate was recorded

at 1.18 per cent. It has been below 2 per cent for the last 36 days, according to the health ministry.

The cumulative doses administered in the country so far under the nationwide Covid-19 vaccination drive has exceeded 105.43 crore.

India's Covid-19 tally had crossed the 20-lakh mark on August 7, 2020, 30 lakh on August 23, 40 lakh on September 5 and 50 lakh on September 16.

It went past 60 lakh on September 28, 70 lakh on October 11, crossed 80 lakh on October 29, 90 lakh on November 20 and surpassed the one-crore mark on December 19.

India crossed the grim milestone of two crore on May 4 and three crore on June 23.

The 549 new fatalities include 471 from Kerala and 36 from Maharashtra.

Kerala has been reconciling Covid deaths since the last few days, hence the death tally of the state is high. Of the 471 deaths, 86 were reported in the last few days, 276 were those which were not confirmed until June 18 last year due to lack of adequate documentation and 109 were designated as Covid deaths after receiving appeals based on the new guidelines of the Centre and Supreme Court directions, a state government release said on Friday.

A total of 4,57,740 deaths have been reported so far in the country, including 1,40,170 from Maharashtra, 38,061 from Karnataka, 36,083 from Tamil Nadu, 31,156 from Kerala, 25,091 from Delhi, 22,900 from Uttar Pradesh and 19,113 from West Bengal.

The health ministry stressed that more than 70 per cent of the deaths occurred due to comorbidities.

"Our figures are being reconciled with the Indian Council of Medical Research," the ministry said

on its website, adding that the state-wise distribution of figures is subject to further verification and reconciliation.



How to create a truly digital public

Varad Pande, Sarayu Natarajan write: Technology must be designed with the people in mind.



Recognising the power of technology to drive inclusion at a massive scale, the state is doubling down on technology to reach more citizens and serve them better.

Written by [Varad Pande](#) , [Saray Natarajan](#) | Updated: October 31, 2021 7:49:05 am

Deepak, a plumber, lives on the outskirts of Lucknow and doesn't have a smartphone. A friend offered to help him register for a [Covid-19](#) vaccine on the CoWin portal. He refused, saying, "I am waiting for the panchayat to organise this; our leader wants us to take it from there..."

THE TIMES OF INDIA

Rare procedure saves TB patient with spine trouble

TNN | Nov 1, 2021, 03.35 AM IST

Bengaluru: A rare procedure involving two surgeries by Bengaluru doctors has helped save the spine of a 36-year-old tuberculosis patient, which was on the verge of collapsing.

Pushpa (name changed), a tuberculosis patient began experiencing severe back pain a year ago and was bedridden. She suffered weakness in lower limbs for the past few months despite being on anti-tubercular therapy and pain killers.



Picture used for representational purpose only

Pushpa was suffering from a condition called Pott's spine or Tuberculosis Spine where the doctors noticed vertebral (spine) body destruction in the mid spine area, marginal sclerosis and significant discitis (inflammation between intervertebral discs of the spine). There was also pus around the spine.

Two expert surgeons, Dr Shashikiran (minimal access thoracic, gastrointestinal and general surgeon) and Dr Sanjeev MN, (orthopaedic surgeon), with help from consultant neurosurgeon from Ace Suhas Multispecialty Hospital, Jigani, Bengaluru, performed two surgeries — spine

stabilisation and video-assisted thoracoscopic surgery (VATS) —on Pushpa.

Dr Jagadish Hiremath, medical director of Ace Suhas Multispecialty Hospital and chairman at Aasra, said it is rare that both spine stabilisation and VATS are done on a single sitting as a therapeutic surgery. "Both are done independently but in this case, we needed both on a single sitting without which the condition would have aggravated, leading to spine collapse," he said.

Dr Hiremath said Pushpa's condition was one of the oldest diseases known to mankind and has been found in Egyptian mummies dating back to 3400 BC. In cases where the patient suffers from Pott's spine, the tuberculosis virus eats the bone in the spine which makes the spine weak and eventually collapse. The patient then develops Paraplegia, a condition where he/she loses sensation in the areas below the point at which the spine collapses, he said.

After the surgeries that lasted for 11 hours, Pushpa will now be able to live a normal life. "It was a challenge for me to take care of my personal hygiene earlier. Now I can sit, stand and walk," she said.

THE TIMES OF INDIA

IIIT-Bhagalpur's software for Covid test gets ICMR nod

TNN | Oct 27, 2021, 04.00 AM IST

BHAGALPUR: The Indian Council of Medical Research (ICMR) has approved the Artificial Intelligence (AI) based software technology 'COVZN', developed by the IIIT-Bhagalpur for

detection of Covid-19, tuberculosis and other severe chest infections at low cost and in less time. The ICMR has given its nod to use it at hospitals and laboratories across the country.



Picture used for representational purpose only

The researchers at IIIT-Bhagalpur had started working on the project after the surge of Covid-19 patients and delay in Covid testing since March, 2020.

The IIIT-Bhagalpur director, Prof Arvind Choubey, headed the research team. He told this newspaper that the 'COVZN software technology' is able to read the scanned chest x-ray film or plate as well as High Resolution Computed Tomography (HRCT)/computerized tomography (CT) scan uploaded to the computer in less than one second through the software programme.

"The cost of diagnosis of Covid-19 infection would be less than Rs100 through this software technology, compared to the conventional microbiological swab tests at present. It will also save two-three days or even more in getting the test results. The COVZN is able to detect tuberculosis and other complicated chest diseases too."

Choubey, along with fellow assistant professor Sandip Raj, claimed that the ICMR and union ministry of health made elaborate test run before validating the innovative technology, through which precious lives, time and money of patients in diagnosing Covid-19 infection will be saved.

Coimbatore hospital saves life of man by removing mucormycosis-infected part of lung

TNN | Oct 26, 2021, 06.56 PM IST

COIMBATORE: A team of doctors in the cardiothoracic department of Coimbatore Medical College Hospital (CMCH) treated a 37-year-old man by removing a part of his left lung infected with mucormycosis. The lower lobe, which is about 40% of the left lung, was removed in a surgical procedure thereby preventing the infection from spreading to other parts.

“While lobectomy (surgical removal of a lobe of an organ) was performed for patients with tuberculosis and fibrosis in the cardiothoracic surgery department, this is the first time that it is performed for mucormycosis in CMCH,” said CMCH dean A Nirmala.

She said mucormycosis has a systematic spread. If it goes into the blood vessel through the lung, the chance of infection spreading to other nearby organs is very high. A lobectomy procedure was essential to prevent such a condition.



The patient and CMCH doctors who treated him



A team of five doctors led by Dr E Seerinivasan, head of cardiothoracic surgery department, carried out the surgery on September 30.

The patient -- L Govindharajan of Mettur in Salem district -- was admitted to a private hospital in Coimbatore for Covid-19 treatment in April. He had a very high level of pulmonary involvement of Covid-19. He was treated and discharged. He was admitted to a private hospital in Salem a few days ago following complaints of hemoptysis (coughing up of blood). The patient was found to have his left lung's lower lobe infected with mucormycosis.

The patient was referred to CMCH. Doctors in the cardiothoracic surgery department found that mucormycosis had completely damaged the lower part of the lung.

The patient is doing well after the surgery which was done under the chief minister comprehensive health insurance scheme. The surgery would cost around Rs 3-5 lakh in a private facility, said the dean.

New fungal infection found in post-Covid patients

TNN | Oct 26, 2021, 04.48 AM IST

NAGPUR: While the country is witnessing decline in number of Covid-19 cases, several under-diagnosed post-Covid complications are now coming to fore. After black fungus in lungs, and yellow fungus in eyes, a difficult to diagnose complication of the dreaded virus which causes bone damage to the spinal-disc spaces has been reported in Nagpur.

The symptoms of this infection include fever and chills, shortness of breath, coughing with blood, skin lesions, an joint pain.

This infection is called aspergillus osteomyelitis. Internal medicine and critical care consultant Dr Vaibhav Agrawal informed that the cases of this infection are on a gradual increase. "We have started getting some patients in hospitals. Especially, Covid-19 recovered patients complaining of mild fever and back pain are suffering from this fungal infection," said Dr Agrawal.

"This infection has led to severe bone damage to the spinal-disc spaces of a patient," he added. This invasive fungal infection is extremely difficult to diagnose as it mimics spinal tuberculosis (TB).

Dr Agrawal said aspergillosis is an infection caused by a type of mold or fungus called aspergillus. This fungus is commonly found in the environment but does not lead to any kind of infection in a healthy individual. However, when a person with compromised immunity or lung infection breathes in the spores, they may develop allergic reactions and lung infections due to it.

"In severe cases, it can even spread to blood vessels and beyond. The symptoms of this new fungal infection depend on the type of aspergillosis a person is infected with," he added.

Infectious disease specialist Dr Ashwini Tayade said aspergillosis is a well-established infection and cases were seen along with the mucormycosis outbreak post second wave of the pandemic. "Covid-19 associated pulmonary aspergillosis

(CAPA) is known to doctors. Such fungal infection has been detected in mouth cavities of Covid-recovered patients, and, in rare cases, in lungs," she said. Infectious disease specialist Dr Nitin Shinde claimed that half the post-Covid mucormycosis cases were actually aspergillosis. "However, the worst is now over. Those who had severe Covid and had steroids should not neglect some common symptoms of this infection," he said. Doctors said that patients who have recovered from Covid recently, and have a persisting backache, should contact the doctor immediately and get an MRI scan done. If detected and treated early, patient might be spared the most agonising complications. The symptoms of this infection include fever and chills, shortness of breath, coughing with blood, skin lesions, and joint pain.

nature

EDITORIAL

27 October 2021

The COVID pandemic must lead to tuberculosis vaccines

The coronavirus crisis has halted decades of progress on TB. But the speed of COVID vaccines shows there can still be hope for advances against neglected diseases.

A tuberculosis patient consults with their doctor in Indonesia. Diagnosis and treatment of the disease has been severely affected by the COVID-19 pandemic. Credit: Jefri Tarigan/Anadolu Agency/Getty

Researchers and clinicians are upset and frustrated that decades of work in diagnosing, treating and researching tuberculosis (TB) have massively stalled. The slowdown means the world

is losing ground against a disease that kills 1.5 million people every year.

As the International Union Against Tuberculosis and Lung Disease held its annual conference online last week, Guy Marks, the union's president, spoke for many when, comparing efforts against COVID-19, he said: "Many of us who work in the [TB] field feel robbed that equivalent efforts to develop a TB vaccine have never been as well committed or funded."

Marks added: "The failure to deliver COVID-19 vaccines to low- and middle-income countries and end tuberculosis are two sides of the same coin — a devaluation of human life in poor countries." He has a point. But it doesn't need to be this way.

Researchers are again urging decision-makers to revive diagnosis, treatment and research programmes for TB and other infectious diseases, such as malaria. And they are saying that much can be learnt from how the creation of COVID-19 vaccines was fast-tracked.

Researchers have been warning that even more people will die from TB and other infectious diseases, such as malaria and HIV, if health systems continue to neglect these infections because of the continuing focus on coronavirus (see [Nature 597, 314; 2021](#)). And they are pleading with funders and governments not to drop the ball on TB work.

But their warnings are not being heeded. Not only are more people dying of the disease, but a target to reduce deaths by 90% from 2015 levels by 2030 — part of the United Nations Sustainable Development Goals — is now in peril. According to research published this month, this failure will also lead to profound economic and health losses in the trillions of dollars — with the greatest impact in sub-Saharan Africa ([S. Silva et al. Lancet Glob. Health 9, E1372–E1379; 2021](#)).

A crucial problem is that fewer medical professionals have been available to diagnose and treat TB. As a result, the number of people diagnosed with the disease fell from 7.1 million in 2019 to 5.8 million in 2020. India, Indonesia and the Philippines are the most affected countries, according to the World Health Organization's (WHO's) latest TB report, published this month (see go.nature.com/3re4n6j).

At the same time, funding has also shrunk. Global spending on TB diagnostic, treatment and prevention services dropped from US\$5.8 billion to \$5.3 billion in 2020. Moreover, this overall spending is less than half of the WHO's global target of \$13 billion annually by 2022. TB research funding is also half of what it needs to be. The WHO set a separate target for this of \$2 billion annually for 2018–22. In 2019, funding for TB research totalled only \$901 million. By contrast, the US National Institutes of Health alone has set aside \$4.9 billion for research on COVID-19. Published research in TB seems to be holding up for now, according to an analysis published this week in Nature Index (see [Nature 598, S10–S13; 2021](#)).

Some conference delegates spoke of lowering the targets for diagnosing and treating TB (and for other infectious diseases) to account for these and other ground realities. But that would be inadvisable. Although the COVID-19 pandemic is the highest priority for political leaders, wealthier nations and philanthropic donors, the pandemic has also shown how it is possible to boost both research into an infectious disease and treatment — and to do so at speed, which has led to COVID-19 vaccines in record time.

Lessons from COVID-19 must be applied to the fight against TB and other infectious diseases — from extraordinary resource mobilization to the use of emerging technologies, such as messenger RNA and other platforms to create vaccines. Advances in rapid and reliable

diagnostics, advanced computation, sequencing and clinical-trial capacity for new vaccines and treatments can all be harnessed for TB and other infectious diseases.

The TB vaccine in use today is essentially the same as the Bacillus Calmette–Guérin (BCG) vaccine introduced in July 1921. The COVID-19 pandemic has shown that it's possible to produce new vaccines in one year, not 100 — provided that there is funding and political will.

Nature **598**, 540 (2021)

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Tuberculosis kills more than a million people every year: WHO

[Sneha Mordani](#)

New Delhi

October 26, 2021

UPDATED: October 26, 2021 19:39 IST

Despite being a preventable and treatable disease, tuberculosis kills more than a million people every year, World Health Organisation (WHO) Director-General Dr Tedros Adhanom said.

"Despite being a preventable and treatable, TB kills more than a million people every year, almost half of them in the WHO South East-Asia Region. We must intensify effort towards ending TB," Dr Tedros Adhanom said while addressing a high-level meeting on tuberculosis.

The Ministers of Health of countries in WHO South-East Asia Region on Tuesday committed to renew and accelerate efforts to end tuberculosis

in view of the pandemic disrupting services and leading to increase in TB cases in the already high-burden region. The meeting was organised by ministries of health of India, Indonesia, and Nepal and WHO South-East Asia Regional Office.

Dr Poonam Khetrapal Singh, Regional Director, WHO South-East Asia Region, said, "Immediate steps are needed to scale-up preventive, diagnostic and treatment services for TB, and significantly bolster social protection measures while specifically addressing undernutrition among the vulnerable populations."

At the day-long meeting held virtually, the ministers signed on a 'Ministerial Statement of Commitment' unanimously committing to actualise and intensify essential interventions.

The ministers committed to multi-sectoral and whole of society approach to end TB with national programs led by the highest possible political level, and closely monitored for targets.

They agreed to increase budgetary and human resource allocations including upfront investments required to catch-up on lost ground during the Covid-19 pandemic. It is estimated that US\$ 3 billion may be needed annually to implement comprehensive set of interventions required to end TB in the Region.

A joint statement by the ministers called for ensuring the highest attainable standards of rights-based, stigma-free, quality-assured and people-centric services. It emphasised that preventive, diagnostic, treatment, rehabilitative and palliative care, should be accessible to all including migrants, prisoners, children, the aged and other high-risk populations such as people with TB/HIV co-infections.

The statement called for increasing outreach of care by strengthening services at all possible health centers and use of innovative care and delivery approaches such as digital health and

efficient use of technology to reach the unreached.

The Ministers of Health committed to mainstream social and financial protection along with TB care services. Poverty and undernutrition are among the biggest contributor to TB disease. Systematic provision of socioeconomic support, adapted to country context, to the patient and family are essential and more relevant in the Covid-19 era, the statement said.

It called for social support to TB patients and their families from the time of development of symptoms, to diagnosis till the successful treatment completion and in some case beyond treatment to address the sequelae, to achieve the goal of eliminating catastrophic financial losses.

The Ministerial statement emphasised on empowerment and engagement of community and civil society representatives in planning, monitoring, organizing and providing for such support to ensure a people-centered response.

The Regional Director said, "While we continue to work together to mobilize political and financial commitment, we will also continue to provide rapid and relevant guidance and technical assistance to all countries in the Region."

"Together, let us renew and reinvigorate our commitment to End TB, for a fairer, healthier, more health-secure and sustainable Region and world for all," Dr Khetrpal Singh said.



The Next Big One: Drug-Resistant Airborne Tuberculosis

Oct 28, 2021, 11:56am EDT | 919 views

[William A. Haseltine](#) Contributor

Even prior to the Covid-19 pandemic, there has been much discussion of what will be the next big pandemic and how do we prepare for it. [New research](#) has found that tuberculosis bacteria can spread via airborne and asymptomatic transmission similarly to SARS-CoV-2. This finding upends the conventional wisdom that coughing was the main route of transmission. It is these two characteristics that make SARS-CoV-2 so dangerous. Therefore I believe the next big pandemic might well be drug-resistant tuberculosis.

The [pre-print study](#) from South Africa has found that greater than 90 percent of tuberculosis bacteria released from an infected person may be carried in aerosols that are expelled when a person breathes out. Aerosols released from normal breathing will also linger in the air for longer than droplets released from coughs. Study co-author Ryan Dinkale told the [New York Times](#) "if an infected person breathes 22,000 times per day while coughing up to 500 times, then coughing accounts for as little as 7 percent of the total bacteria emitted by an infected patient".

Tuberculosis is caused by a bacterium called *Mycobacterium tuberculosis*, which usually attacks the lungs. The researchers were concerned about how diagnosis and treatment of tuberculosis had changed very little over the decades and sought a better understanding of how *Mycobacterium tuberculosis* aerosolizes and transmits. With South Africa (a high burden tuberculosis country) reporting that nearly 60% of individuals with bacteriologically confirmed pulmonary tuberculosis were asymptomatic. The researchers were particularly intrigued by how transmission occurs in these asymptomatic cases that were cough-independent.

The researchers developed a platform combining non-invasive bioaerosol capture

technology and fluorescence microscopy to accurately measure the viable Mycobacterium tuberculosis released by confirmed tuberculosis patients. They created three separate respiratory scenarios for comparison, including Tidal Breathing, otherwise known as restful breathing, Forced Vital Capacity, in which the person takes the maximum inhale and exhale they can and Cough. Viable Mycobacterium tuberculosis bacilli were detected in 66%, 70%, and 65% of Tidal breathing, Forced Vital Capacity, and Cough samples respectively. While coughing increases particle aerosolization compared to Tidal breathing, this was not associated with increased Mycobacterium tuberculosis aerosolization. Instead, Tidal breathing produces more Mycobacterium tuberculosis per particle than coughing. If we assume the number of viable Mycobacterium tuberculosis organisms detected provides an accurate measure of patient infectiousness, Tidal breathing could be considered the main route of tuberculosis transmission.

These results should have a significant impact on the public health, diagnostic and medical guidelines for tuberculosis. We should be implementing some of the methods used to limit Covid transmission such as high-quality masks and ventilation and encouraging outdoor gatherings and events to limit tuberculosis transmission in countries with a high volume of cases.

The results also cause concern for transmission of tuberculosis during air travel and the continual seeding of cases globally. While this is presently not reported as a common occurrence it is possible. [From 1992 to 1994](#), the CDC worked with state and local health departments, conducted contact investigations for seven index cases of infectious tuberculosis.

When investigating close contacts they found evidence of transmission of tuberculosis infection during a flight in two of the seven index cases. In

one event, transmission from a cabin flight attendant was detected in 2 of 212 crew members who had worked in close proximity with the index case during a 6-month period. Both of those infected were exposed to the infectious source for at least 12 hours. In the other event, there was a probable transmission from an infectious case to 4 passengers (seated in close proximity to the index case in the same cabin section), out of a total of 257 passengers tested on a flight longer than 8 hours. Specifically, multidrug-resistant tuberculosis remains a public health crisis and a health security threat. Only about one in three people with drug-resistant tuberculosis accessed treatment in 2020 and from 2018 to 2019, the rate of drug-resistant tuberculosis infections increased by approximately 10%.

We need to seriously reevaluate the way we diagnose and screen for tuberculosis. The Covid pandemic disrupted access to health care and supply chains around the globe. Lockdowns often prevented people from accessing care and in many countries, human, financial, and other resources were diverted from tuberculosis to the Covid-19 response. As a result, 5.8 million people were diagnosed with tuberculosis in 2020, yet a WHO report [estimates that about 10 million people were infected](#) and more than [1.5 million died](#) from tuberculosis, the first increase in a decade.

With the increase in asymptomatic cases, many may be unwittingly infecting others. Instead of waiting for patients with symptoms to seek out care, we should be screening entire populations as some countries have successfully done with Covid. As the pandemic continues to rage, we must not continue to delay or ignore public health screenings. A recent [Lancet](#) study reports nearly half (47%) of the global population has limited or no access to key tests and services that are essential for diagnosing common diseases, such as diabetes, hypertension, HIV, and

tuberculosis, or basic tests for pregnant women such as hepatitis B and syphilis.

[Egypt's 100 Million Healthy Lives initiative](#) provides an example of how we could screen entire populations. Egypt previously had the highest rate of Hepatitis C in the world. In 2018, Egypt launched the 100 Million Healthy Lives program. The goal was to screen all Egyptians over the age of 12 for active hepatitis C virus replication along with other chronic conditions such as hypertension, diabetes, and obesity. Treatment was offered for free in government clinics for those who tested positive for hepatitis C, hypertension, and diabetes; free counseling was available for those considered obese.

Approximately 4 million people with active hepatitis C were identified and treated with the antiviral medication Sovaldi (sofosbuvir), a nucleotide analogue that inhibits the polymerase enzyme of hepatitis C and blocks its replication, effectively eliminating hepatitis C from Egypt. Once initiated, the program was completed in 18 months. The cost to the Egyptian government was about \$45 per 3-month treatment. Patients electing to receive treatment at a private clinic paid \$75. The program was primarily funded by a World Bank loan of \$530 million. About half of the loan was to expand screening and treatment and the remainder was for health system strengthening.

A similar program could be put in place to control tuberculosis in almost any country. Countries that can not presently afford the cost, can seek out similar loans or grants. Implementing these screening and treatment programs could save millions of lives in the immediate future and avoid the global disruption Covid has caused. As we have learnt from Covid, no one is safe from infection and disease until we are all safe

MEDICINE

Tuberculosis

[Scott Pallett](#) and [Angela Houston](#)

Available online 27 October 2021

Abstract

Tuberculosis (TB) is a communicable, [airborne infectious disease](#) caused by the bacterium *Mycobacterium tuberculosis* (MTB). A quarter of the world's population is infected with TB, affecting all age groups. Infection with MTB results in latent or active disease. Latent infection is associated with a 10% lifetime risk of developing active disease, but this is much higher in those with concurrent [immunosuppression](#). Despite being both preventable and curable, TB remains the leading cause of global death from a single infectious agent. Active disease most commonly affects the lungs but can spread to cause extrapulmonary disease anywhere in the body. Over half of individuals in the UK now present with features of [extrapulmonary TB](#), those with HIV being at particular risk. In all cases, obtaining samples for TB culture is absolutely vital. Standard treatment is with quadruple therapy for 6 months, extended in TB meningitis and often TB bone infection. Adjunctive corticosteroids have proven benefit in TB meningitis and TB [pericarditis](#), and can be considered in other circumstances, such as paradoxical reactions to starting treatment in [miliary TB](#). Despite recent gains in diagnosing and treating TB cases worldwide, the global COVID-19 pandemic is likely to have significantly affected recent progress.

So: <https://doi.org/10.1016/j.mpmed.2021.09.005>

Now Is the Time: Let's End TB in Ukraine

Viktoriia Gultai | Mariia Dolynska | Dr. Kartlos Kankadze

March 24, 2016 | 3 Minute ReadHealth | Tuberculosis | Health Systems

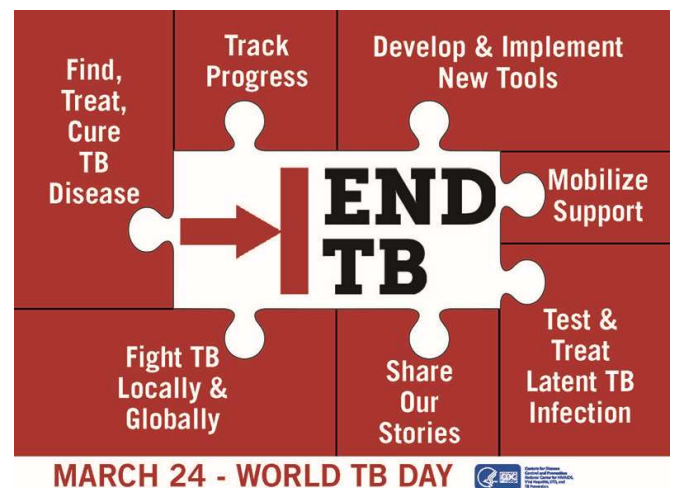
Experts in Ukraine weigh in on how to achieve the End TB goals in one of Europe's most populous countries, where TB remains a persistent and life-threatening public health issue.

The theme of World TB Day this year, "Unite to End TB," reflects the World Health Organization's (WHO's) End TB Strategy, which recently replaced the Stop TB Strategy and corresponds to the UN Sustainable Development Goals (SDGs). End TB sets an ambitious agenda between now and 2035, targeting a 95 percent reduction in number of TB-related deaths, 90 percent reduction in TB incidence rate, and zero families facing catastrophic costs due to TB. Here in Ukraine, our USAID Strengthening Tuberculosis Control in Ukraine (STbCU) project team wonders: What will it take to achieve these ambitious goals in one of Europe's most populous countries, where TB has been a persistent public health concern for many years?

Is End TB possible in Ukraine?

Recently, Ukraine has made some critical advancements on the path to ending TB. For example, with WHO, USAID, and other donors, Ukraine's National TB Control Program has updated its clinical protocols on TB and TB/HIV, institutionalized primary health care involvement in TB case detection and treatment, and revised national and regional policies. TB laboratories implementing WHO-recommended external quality assurance have proliferated and are now

contributing to more effective TB treatment in many areas. Ukraine has also taken a major step forward in continual medical education by building its first distance learning platform for TB-related issues. Our STbCU team, along with local NGOs under grants, have contributed to all these improvements, and we continue to push for positive change.



Yet the TB-related Millennium Development Goals were not achieved in Ukraine. Today, the TB-related death rate is almost six times higher than the target (at 12.2 cases per 100,000 people), the TB incidence rate is 1.5 times higher (58.8 cases per 100,000 people), and the TB prevalence rate is nearly three times higher (at 90.2 cases per 100,000 people). We strongly believe that Ukraine can achieve the Stop TB goals despite the challenges. Countries like Latvia have already made great progress. To do so, it needs to follow such countries and continue to move beyond Soviet-era attitudes and practices related to TB while adopting new technologies. More specifically, we consider these to be the most important actions Ukraine and donors can take to end TB:

1. Shift to a new paradigm of TB treatment based on WHO standards

Soviet-era approaches are no longer adequate to address the challenges Ukraine faces like multi-drug-resistant TB, TB/HIV co-infections,

outdated health infrastructure, and a lack of trained staff, equipment, motivation, and monitoring. Evidence-based, WHO-recommended practices should be introduced and scaled. For this to happen, it is important to address the habit of relying on personal experience or conventional wisdom rather than on data that prove the effectiveness of new approaches.

2. Push for reform in key aspects of treatment

The Ministry of Health should involve other government stakeholders to push together in these principle directions:

Prioritize of outpatient treatment. The excessive duration of inpatient treatment (3-6 months) for TB is part of the Soviet legacy. Outpatient treatment is cheaper and more convenient for patients. The outpatient treatment is vital for Ukraine also due to poor condition of the most TB hospitals, which leads to TB transmission inside.

Involve primary health care institutions in TB detection and treatment. Until recently, only special TB facilities dealt with TB. This approach is changing to make TB services closer to patients and should continue to change.

Fund socio-psychological support for TB patients. Such support is especially important for patients who are in difficult life circumstances, whose low adherence to treatment jeopardizes their health.

3. Encourage community involvement in supporting TB victims

Community involvement by activists and TB survivors is important at all levels: from advocating patients' rights, to reducing stigma and discrimination, to providing socio-psychological support.

4. Target technical assistance at the most vulnerable points

Sharing international experience, scaling up world's best practices, introducing new technologies, and supporting structural reforms – in all of these areas there is a huge need for continued technical support and expertise from the global development community.

Encouraging Results in Latvia

Latvia is a good example for Ukraine. It had the same heavy heritage from the Soviet Union, the same approaches to TB treatment, and a similar hospital infrastructure that did not comply with infection control rules.

However, due to strong political will and a flexible system of reasonable planning, Latvia managed to reform its health practices to involve primary health care in TB case management, introduce outpatient TB treatment, create a sustainable state system of social support for TB patients, and update TB hospital infrastructure in accordance to modern infection control requirements.

As result, Latvia cut its multi-drug-resistant TB level nearly in half, from about 15 percent among new TB cases in 2002 to 8.2 percent in 2014.

Will Ukraine be able to end TB? We believe with all our hearts that it can if it mobilizes its political will and learns from the experience of the international community.

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