



## DAILY NEWS BULLETIN

LEADING HEALTH, POPULATION AND FAMILY WELFARE STORIES OF THE DAY  
Tuesday 20191105

### प्रदूषण

**दिल्ली-NCR में कुछ कम हुआ प्रदूषण, 7-8 नवंबर को बारिश के आसार; मौसम भी दे रहा था (Dainik Jagran: 20191105)**

<https://www.jagran.com/delhi/new-delhi-city-delhi-pollution-2019-report-live-again-air-quality-index-in-severe-category-in-delhi-and-ncr-19727174.html>

उत्तर भारत की मौसम और वेस्टर्न डिस्टर्बेस के चलते दिल्ली-एनसीआर की हवा में सुधार हुआ है। मौसम विभाग की मानें तो अगले कुछ दिनों में और सुधार होगा।

नई दिल्ली, ऑनलाइन डेस्क/एएनआइ। Delhi Pollution 2019 Report LIVE: दिल्ली-एनसीआर को अगले कुछ दिनों के दौरान प्रदूषण से राहत मिलने की उम्मीद जताई जा रही है। दरअसल, भारतीय मौसम विज्ञान विभाग (India Meteorological Department) के मुताबिक, उत्तर भारत की मौसम और वेस्टर्न डिस्टर्बेस के चलते दिल्ली-एनसीआर की हवा में सुधार हुआ है। मौसम विभाग की मानें तो अगले कुछ दिनों में और सुधार होगा। वहीं, 7-8 नवंबर को बारिश का भी पूर्वानुमान जताया गया है।

दिल्ली-एनसीआर में बढ़ते प्रदूषण को लेकर उठाए गए कदम कारगर साबित नहीं हो रहे हैं। वहीं, मंगलवार को तेज धूप निकली हुई है और स्मॉग का असर रविवार और सोमवार की तुलना में कम है। इससे लोगों ने हल्की राहत महसूस की है।

सोमवार को अपने आदेश में एनजीटी ने दिल्ली प्रदूषण कंट्रोल बोर्ड के चेयरमैन के अलावा सीपीसीबी के चेयरमैन को भी मंगलवार सुबह 10:30 बजे पेश होने का आदेश दिया है।

मंगलवार को उत्तर प्रदेश के लोनी से विधायक नंद किशोर गुर्जर (Nand Kishor Gurjar, BJP MLA from Loni, Ghaziabad) ने पीएम मोदी (Prime Minister Narendra Modi) को खत लिखकर कृत्रिक बारिश कराने की मांग की है, ताकि यहां पर प्रदूषण कम हो सके।

स्काइमेट वैदर के मुताबिक, जम्मू-कश्मीर के पास से एक पश्चिमी विक्षोभ आगे बढ़ रहा है। इससे दिल्ली-एनसीआर समेत उत्तर भारत के मैदानी इलाकों में उत्तर पश्चिमी शुष्क हवाएं पहुंचनी शुरू हो गई हैं जिससे दिल्ली-NCR में रहने वाले लोगों को प्रदूषण से निजात मिलेगी।

मंगलवार को भी नहीं मिली कोई खास राहत, सोमवार की तरह बढ़ा हुआ है वायु गुणवत्ता सूचकांक नोएडा, गाजियाबाद, गुरुग्राम और फरीदाबाद में भी वायु गुणवत्ता सूचकांक 300 के पार है

नोएडा में वायु गुणवत्ता सूचकांक 519 तो ग्रेटर नोएडा में 424 है।

दिल्ली से सटे गाजियाबाद में वायु गुणवत्ता सूचकांक 492 है

बता दें कि दिवाली के अगले दिन से वायु गुणवत्ता सूचकांक (Air Quality Index) स्तर में इजाफा कम होने का नाम नहीं ले रहा है। समाचार एजेंसी एएनआइ के मुताबिक, दिल्ली में मंगलवार सुबह दिल्ली के लोधी रोड इलाके में पीएम 2.5 का स्तर 500 तो पीएम 10 का स्तर 41 बना हुआ है। ऐसे में औसत AQI 400 से अधिक है, जो लोगों के स्वास्थ्य के लिए हानिकारक है।

हवा की गति ने गिरा एयर इंडेक्स का आंकड़ा

दिल्ली में प्रदूषण के स्तर में गिरावट दर्ज हुई है। सोमवार को प्रदूषण के स्तर में रविवार की तुलना में कमी आई है। केंद्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) के अनुसार सोमवार को दिल्ली का एयर इंडेक्स 494 दर्ज हुआ। मौसम वैज्ञानिकों ने संकेत दिए हैं कि अगले दो दिनों तक दिल्ली में 20 किलोमीटर प्रति घंटे की रफ्तार से हवा चलेगी तो प्रदूषण के स्तर में और भी गिरावट आएगी। हालांकि दिल्ली में सोमवार के दिन हवा चलने के बाद भी खतरनाक श्रेणी में प्रदूषण का स्तर बना हुआ है।

मौसम वैज्ञानिक कुलदीप श्रीवास्तव ने बताया कि दिल्ली और आसपास के इलाकों में सोमवार को 20 किलोमीटर प्रति घंटे की रफ्तार से हवा चली। मंगलवार को भी प्रदूषण के स्तर में कमी आने की उम्मीद है। प्रदूषण का स्तर खतरनाक श्रेणी से गिरकर खराब श्रेणी में आ सकता है। उन्होंने बताया कि इसके बाद 7 नवंबर के दिन दिल्ली और आसपास के इलाकों में बारिश होने की संभावना है। उत्तर भारत में फिर से पश्चिमी विक्षोभ सक्रिय होगा।

**Strong breeze, sunshine after 6 days come to Delhi's rescue (Hindustan Times: 20191105)**

<https://epaper.hindustantimes.com/Home/ArticleView>

New Delhi : Sunshine broke through thick smog on Monday as the toxic blanket that engulfed Delhi appeared to lift because of increased wind speeds, improving the air quality to “very poor” by evening, on a day emergency road rationing measures kicked in to combat the national capital’s public health crisis.

The drop in pollution again demonstrated how Delhi is largely defenceless against adverse meteorological conditions in the absence of an effective response from authorities. While the city wore a desolate look on Sunday, when low wind speed led to abysmal visibility caused by smog, an improvement in weather provided much-needed relief to residents complaining of itchy throats, burning eyes and shortness of breath.

HT reported on Monday that a combination of scanty rainfall and weak wind created a “smog blanket” up to the height of 50 metres over the national capital, with experts saying ad hoc measures had again failed the city.

The India Meteorological Department (IMD) said a fresh western disturbance – a weather pattern that brings rainfall – is approaching north India, and scattered rainfall and change in wind direction could further improve the air quality in Delhi by November 8.

The Central Pollution Control Board’s (CPCB) 4pm bulletin on the Air Quality Index (AQI) on Monday showed the pollution was “severe” at 407, which was a considerable improvement over the previous day’s recording of 494, the worst in three years. The gusts of wind ensured that the reading went down to 360 in the “very poor” category by 11pm.

The AQI reading at a given time is an average of the readings from the previous 24 hours. Air quality is considered good when the AQI is below 50 and satisfactory under 100.

The Supreme Court, which stepped in on Monday amid increasing voices for an effective solution to arrest the annual air crisis, said people in Delhi-NCR are losing “precious years of their lives” and cannot be “left to die” due to the “atrocious” pollution situation, which reflects a “shocking state of affairs”.

“Can we survive in this atmosphere? This is not the way we can survive,” the bench of justices Arun Mishra and Deepak Gupta said, adding that the authorities have left the people to die.

The apex court has taken a stern view of the deteriorating air quality over the past few years and an SC-mandated body, the Environment Pollution Control Authority (EPCA), has taken several steps to control the menace.

The national weather department said Cyclone Maha and a western disturbance will cause rainfall in parts of the northern plains, covering Rajasthan, Punjab, Haryana, western Uttar Pradesh and Delhi-NCR, on Wednesday and Thursday, which will improve the situation further.

Experts said a significant increase in the wind speed, up to about 20km per hour, dispersed the pollutants.

“It was after long, may be after Diwali day, that the sky was clear, with sunlight being able to penetrate to the ground. Also, the winds picked up pace, helping pollution levels to improve. Though in ‘severe’ zone, the toxicity in the air reduced by noon. It is expected to get better on November 5. Air quality may dip again due to cloud formation and rainfall is likely on November 6, but pollution levels will most likely dissipate by the evening,” said Kuldeep Shrivastava, head, regional weather forecasting centre, IMD.

The Union environment ministry’s System of Air Quality and Weather Forecasting And Research (Safar) said: “High surface and boundary layer winds are expected on Tuesday also. A fresh western disturbance, scattered rainfall and change in wind direction are likely to positively influence the AQI in the region.”

Sun rays appeared from the fading smog for the first time in six days. The duration of sunlight the city witnessed through the day was longer than all previous days combined since Diwali, when the national capital rang with thousands of illegal firecrackers, which release noxious fumes and particulate matter.

The Aam Aadmi Party-led Delhi’s government’s road rationing measures began on Monday, with data showing that the traffic compliance this year was better than that compared to the first two editions of the scheme, popularly referred to as “odd-even”.

About 271 challans were issued to violators, who are required to pay a penalty of ~4,000. Under the scheme, private vehicles with odd-numbered registration plates are allowed to run on odd dates, while those with even numbers are permitted on even dates. Studies conducted in the past have raised concerns about effectiveness of the move as many vehicles, including two-wheelers, are exempted.

The SC asked the Delhi government within hours of the scheme’s launch as to why the authorities stopped plying cars that are less polluting compared to two- and three-wheelers, and cabs.

Stopping all construction and demolition activities as well as garbage and waste burning till further orders, the SC directed neighbouring Punjab, Haryana and western Uttar Pradesh to prevent stubble burning.

The court’s remarks came on a day farm fires saw a sharp spike in Punjab. As the cloud cover that militated against an effective mapping of stubble burning cases in the region cleared, Punjab on Monday reported highest number of farm fires this season — 5,953 in a single day,

according to data from the Punjab Agriculture University (PAU). Before Monday, the highest number of stubble burning incidents was 3,135.

Experts have said that the detection of farm fires with the help of satellites could be erroneous as clouds were obscuring the fire incidents. “Satellite fire detection capability is strongly doubtful under dense cloud cover which is prevailing. The unusually low fire counts detected on 2nd November (57) may be partly due to this,” said a statement issued by Safar on Monday.

The period till November 15 is vulnerable to pollution spikes since this is the time when farm fires in Punjab and Haryana peak, and the resulting smoke settles over NCR and adjoining regions. Stubble left behind after the harvest is often burnt by farmers as a quick and cheap way of clearing the field for the next round of sowing.

Farm fires and emissions from firecrackers result in heavy concentrations of PM2.5 ultrafine particles in the air, which can lead to major health problems since they can enter the bloodstream after penetrating deep into the lungs.

The Delhi government declared a public health emergency on Friday and closed schools and all construction activity.

Pollution levels in Ghaziabad (440), Noida (430) and Greater Noida (428) remained at alarming levels. Gurugram and Faridabad’s AQI stood at 370 and 403 respectively, as per the 4pm bulletin.

Principal secretary to Prime Minister Narendra Modi, PK Mishra, reviewed the measures taken by the states of Punjab, Haryana and Delhi to tackle the air pollution. He sought to know the details of additional measures taken to check fresh cases of fire and stubble burning in these states during the last 24 hours.

**40% rise in patients needing critical care when pollution peaks (Hindustan Times: 20191105)**

<https://epaper.hindustantimes.com/Home/ArticleView>

AIIMS study 50% increase in number of children with aggravated respiratory symptoms during the October-January pollution season

New Delhi : The number of patients with acute respiratory symptoms who seek emergency care at the All India Institute of Medical Sciences (AIIMS), Delhi, goes up by up to 40% when the pollution levels peak, according to the preliminary findings of a study done at the hospital to understand the short-term impacts of air pollution.

The peak is seen between October and January, when there is an increase of about 30% in the number of adult patients coming to the hospital emergency, the study shows. There is a 50% increase in the number of children with aggravated respiratory symptoms.

But, Delhiites' health is affected throughout the year and not just when the pollution levels hit "severe" (when the air quality index AQI reads above 401).

The study shows even a small increase in the pollution levels also send patients to the hospital's emergency department.

Sample this: There is a nearly 20% increase in number of patients needing emergency care when PM<sub>2.5</sub> levels, particulate matter of size 2.5 microns or less, is recorded between 50 and 100µg/m<sup>3</sup>. The National Ambient Air Quality Standards prescribe the safe limit of these ultrafine particles as 60µg/m<sup>3</sup>. The World Health Organisation (WHO) number is 25 µg/m<sup>3</sup> over 24-hours.

PM<sub>2.5</sub> are a major health as it can go deep into the lungs and can affect the respiratory system. It can also enter the blood stream and lead to cardio-vascular diseases.

"Doctors across the city must have observed an increase in the number of respiratory patients in need of emergency care when the pollution levels spike during early winter. The data backs it up. But what it also shows is that the smaller increase in pollution levels throughout the year lead to such increases," said Dr Randeep Guleria, director, AIIMS, and professor of pulmonary and sleep medicine. "This means the government needs to bring down the threshold at which action is taken to curb pollution."

In Delhi, there are very few days that conform to the air quality norms. So, the emergency attendance during the monsoon and post monsoon period when the air relatively cleaner has been used as a baseline," said Dr SK Kabra, professor of paediatrics at AIIMS.

"This means Delhi air is never good for people and there is a need to look at the long term consequences of constant exposure to such polluted air," he added.

The increase in people coming in with symptoms such as incessant cough, cold, breathlessness, wheezing and tightness in chest lasts for up to six days after exposure to higher levels of pollution, the 24-month long study shows.

During the study, conducted between June 2017 and May 2019, around 70,000 adults and 56,000 children who came to the emergency department of the hospital were screened. The study does not give a breakup of the patients according to age, and includes those who reported to the emergency ward — both those who have a history of respiratory illness and those who did not.

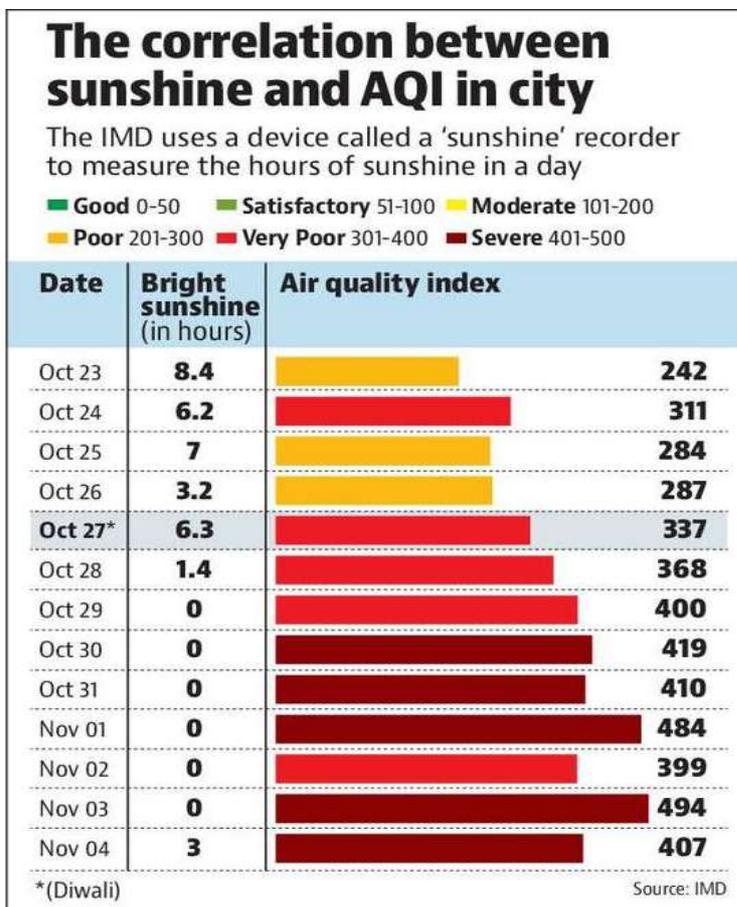
AIIMS is one of the four centres from where the data was collected; Kalawati Saran Children’s Hospital, National Institute of Tuberculosis and Respiratory Diseases, and Vallabhbhai Patel Chest Institute being the others.

“Our centre just collated the data which was analysed according to the pollution levels by AIIMS. We do observe an increase in the number of patients every year during the winters. But, there needs to be more studies on what can and needs to be done to control and reduce it,” said Dr Raj Kumar, director of Vallabhbhai Patel Chest Institute.

**Lack of bright sunshine spiked pollution level (Hindustan Times: 20191105)**

<https://epaper.hindustantimes.com/Home/ArticleView>

New Delhi : Delhi did not receive any ‘bright’ sunshine over the last six days at least. The pale sun, with its diffused rays, failed to heat up the atmosphere. This trapped pollutants near the ground, pushing up pollution to record levels similar to 2016.



It was only on Monday that the city received around three hours of ‘bright’ sunshine after six days. According to the India Meteorological Department’s (IMD) sunshine recorder at Safdarjung, the last time Delhi received some ‘bright’ sunshine was on October 28—just for 1.4 hours.

“Air when heated up by the sun’s rays moves up vertically, which helps to disperse pollutants. But as the sunlight was diffused, this process was hampered and pollutants got trapped close to the ground, pushing up pollution levels. This is just one of the many factors behind the spike,” said an IMD official.

On October 23, when Delhi received around 8.4 hours of bright sunshine, Delhi AQI was 242 (poor category). But as the sun disappeared from October 29, the city’s AQI started increasing. On October 29, the AQI touched 400, just one notch less than the severe level. On November 3, it touched 494.

Experts said it was this diffused sunlight, along with other factors such as low wind speed, northwesterly winds and high moisture, that spiked pollution levels since Diwali. Manmade factors such as smoke from stubble burning in Punjab and Haryana and emission from Diwali crackers worsened the condition.

IMD officials said in the initial period, the clouds blocked the sun’s rays. Later, the blanket of smoke and dust that was enveloping the city further cut off the sun’s rays.

“Sunshine and pollution are closely interlinked and sometimes form a vicious cycle. If the sunshine is cut off, the atmosphere fails to heat up and pollutants don’t get dispersed. When pollution spikes, there is a haze of smoke and dust. This cuts off sunrays, which spikes pollution,” said a senior official of the Delhi environment department.

Aerosols in the air and the clouds seeded by them have been known to reflect about a quarter of the Sun’s energy back to space. Different aerosols scatter or absorb sunlight to varying degrees, depending on their physical properties.

“Sunshine helps to bring down the moisture level, which otherwise makes the air heavy and traps the pollutants close to the ground level. This makes the air lighter and the pollutants rise upwards. The free movement of pollutants make them to disperse faster,” said D Saha, former head of the CPCB’s air quality laboratory.

#### How IMD measures ‘bright sunshine hours’

An instrument named sunshine recorder is used for measurement. The sun’s rays pass through a glass sphere in the instrument and falls on a card board strips graduated in terms of time. Whenever there is sunshine, only that portion of the card is burnt, just like children burn a piece of paper with a magnifying glass using sunlight. Whenever the sun is covered by cloud, that portion of the card is not burnt. As the sun moves, its focused image burns a trace on the card. By measuring the trace at sunset, the duration of ‘bright sunshine’ may be recorded.

## **Pollution levels register dip due to wind (The Hindu: 20191105)**

<https://www.thehindu.com/news/cities/Delhi/pollution-levels-register-dip-due-to-wind/article29883339.ece>

Approaching western disturbance to have positive influence on AQI, says SAFAR

High wind speed on Monday helped bring down pollution levels in the city even as the Air Quality Index (AQI) clocked in at 407, which falls in the 'severe' category. The AQI on Sunday was 494, as per the Central Pollution Control Board (CPCB).

The air quality is expected to be in the 'very poor' category on Tuesday and may further improve from November 8, according to government-run monitoring agency SAFAR (System of Air Quality and Weather Forecasting and Research). The AQI of Delhi was 370, 'very poor', at 8.30 p.m. on Monday, as per CPCB.

On Monday, the share of pollution in the city due to stubble burning in neighbouring States was 14%, down from 25% on Sunday, stated SAFAR.

"High surface and boundary-layer wind is expected on Tuesday, which will improve air quality to 'very poor' level by the morning. A fresh western disturbance is approaching north India, scattered rainfall and change in wind direction is expected by November 8 in Delhi region, which is likely to positively influence AQI," said the monitoring agency

The level of deadly respirable particles PM<sub>2.5</sub> was almost six times (368.6 ug/m<sup>3</sup>) the safe limit (60 ug/m<sup>3</sup>) in Delhi-NCR at 6.30 p.m. on Monday, as per CPCB data. On Sunday, PM<sub>2.5</sub> was over 10 times (625.1 ug/m<sup>3</sup>) the safe limit — the highest recorded so far this season.

'Severe' air quality can cause respiratory problems in healthy people and has serious impact on those with lung or heart diseases, according to a Supreme Court-appointed pollution control body EPCA.

The EPCA on Monday extended a ban on coal-based industries, hot mix plants, and stone crushers in NCR till November 8.

Cricketers move out

Reacting to air pollution in north India, cricketer Harbhajan Singh said in a video shared on Twitter: "North Indian air has become polluted and we all are responsible for it. I have been hearing it for the past many years that due to stubble burning air and water becomes polluted... And the life span will be reduced by 7-10 years if we live like this. So we have to act."

Cricketers Yuvraj Singh and Ashish Nehra have allegedly already moved out of Delhi due to air pollution.

### **Clearing the air: On Delhi's air pollution (The Hindu: 20191105)**

<https://www.thehindu.com/opinion/editorial/clearing-the-air-on-delhis-air-pollution/article29881803.ece>

Tackling Delhi's pollution needs tough, unpopular measures well ahead of winter

Delhi is once again in the grip of its annual, winter pollution crisis. The city's tryst with air pollution crises isn't new. The rising prominence of particulate matter (PM) from various sources has long been a public health scourge. What differentiates the prevalent PM crisis from earlier ones is the public's ability to monitor pollution levels for themselves. The measurement of pollution, which used to be the domain of weather agencies or pollution control boards, can now be done with consumer appliances. However, increased public awareness and social media angst haven't translated into meaningful public action. The Graded Response Action Plan (GRAP) in Delhi, which provides for a ratcheting slew of measures — from stopping construction work to halting private vehicles — isn't effective when air quality reaches its nadir. It recommends action only after pollutants soar. A Task Force — which comprises top officials of Delhi and the Centre — advises the Environmental Pollution Control Authority, which is in charge of enforcing the GRAP. Rarely does it recommend tough pre-emptive action and when it does, there's no real pressure on municipal bodies and police to ensure that polluters are punished.

There is a sense of resignation among both the Centre and the Delhi government about tackling the pollution crisis. Meteorology and Delhi's geography render the city vulnerable to a certain amount of winter pollution, particularly when wind speeds drop to less than 10 kmph. However, preventing local sources of pollution from worsening air quality will require both the State and the Centre to implement unpopular decisions. This would include an outright ban on two wheelers, three wheelers and cars when air quality starts to deteriorate, a halt on construction, shutting down power plants in the vicinity of Delhi and a substantial spike in parking rates. And, of course, getting the farmers of Punjab and Haryana to not burn stubble at all. Even if this confluence of miracles were to occur, it wouldn't guarantee blue skies on a windless day and, therefore, political brownie points. This makes it convenient for governments to engage in theatre such as having Ministers bicycle to work and blaming farmers for burning rice chaff. The Delhi government and the Centre routinely cite pollution figures averaged for the entire year to claim success of some piecemeal measure or the other but hide the lows of October and November. Tackling Delhi's winter air requires tough steps

that need to be in place at least a couple of months before the plummet. At the very least it requires a truly empowered, independent agency that can implement measures while negotiating the tricky relationship between the Centre and Delhi. Else, beyond the momentary outrage, the fight against pollution will remain on a prayer, and the wind.

**Delhi: Spike in emergency visits as air worsens, suggests AIIMS study (The Indian Express: 20191105)**

<https://indianexpress.com/article/cities/delhi/delhi-spike-in-emergency-visits-as-air-worsens-suggests-aiims-study-6103295/>

At AIIMS, the research was conducted from June 2017 to May 2019. More than 56,000 children were screened in the paediatric emergency room and around 70,000 adults in the main emergency room. Approximately 20-30% had respiratory symptoms.

Delhi's air quality worsened last week. (Express photo: Amit Mehra)

A multi-centre study funded by the Indian Council for Medical Research and conducted by AIIMS on around 1.25 lakh patients over two years found that there was an increase by 20-40% in proportion of patients visiting the emergency ward with acute respiratory symptoms as the air quality worsened.

The study, 'Effect of outdoor air pollution on acute respiratory symptoms in Delhi: A multisite study', was conducted at four centres in the city — AIIMS, Vallabhbhai Patel Chest Institute, National Institute of Tuberculosis and Respiratory Diseases and Kalawati Saran Children's Hospital.

While the other institutes are yet to complete the research, the country's top medical institute has got the initial findings, indicating a correlation between pollutant levels and daily percentage of patients with acute respiratory symptoms visiting the emergency ward.

At AIIMS, the research was conducted from June 2017 to May 2019. More than 56,000 children were screened in the paediatric emergency room and around 70,000 adults in the main emergency room. Approximately 20-30% had respiratory symptoms.

“We observed that there was a rise of 20-40% in patients visiting the emergency ward as air quality worsened. We also observed an increase in the number of admissions even when pollutants were lower than permissible limits. There is definite data to suggest that when air quality is bad, it leads to increase in admissions both in the paediatric and adult age group.

The concern we have is that many of these patients become sick and require ICU care. Indirectly, it also leads to higher morbidity and mortality. We have patients whose condition worsened during this time,” said Dr Randeep Guleria, AIIMS director and principal investigator of the study.

Daily pollution levels were obtained from the Delhi Pollution Control Committee. Based on the data, researchers divided the days into worst, moderate and low pollution levels. Experts said the values of pollutants were mostly above permissible levels throughout the year. Data also showed that patients visited the hospital even six days after pollution levels had subsided.

Most common problems for which patients came to the emergency ward included an increase in cough, cold, breathlessness, wheezing and respiratory difficulty. Among adults, the increased rate of admissions were more common in the elderly and those with underlying illnesses such as asthma and COPD.

### **Let's pay the price of clean air (The Indian Express: 20191105)**

<https://indianexpress.com/article/opinion/columns/delhi-pollution-lets-pay-the-price-of-clean-air-quality-index-smog-odd-even-6103211/>

We should stop expecting the farmer to single-handedly bear the burden. And accept that the right economic incentives are the only sustainable solution to this intractable problem.

The writer is a senior private equity leader in renewable energy and climate finance in Asia and India. He is currently a Senior Advisor to Sarona Asset Management, a Canadian private equity fund manager in climate finance.

North India can certainly use and pay for more renewable energy to feed its economic growth. The farmer will happily collect the stubble if there was a profit to be had. What would unlock such a win-win solution? (Illustration: C R Sasikumar)

In the Hollywood classic Groundhog Day, the character played by Bill Murray finds himself waking up every morning to the exact same day as yesterday. Delhi and North India has its Groundhog Day moment every October, when stubble burning from paddy starts and blankets the already toxic air with a fresh inflow of aerial sewage. Like Murray, the residents of Delhi wring their hands while coughing their lungs out in total frustration. However, unlike the movie character, we do control our destiny and can break out of this vicious circle. The solutions are within our grasp provided there is political will and a willingness to use our purse to fund our way out of this problem.

Let us first understand the problem. Every year, when farmers harvest their paddy crop in north India, they are left with an annoying stubble that is hard, expensive to pull out of the ground and has no commercial use after extraction. The problem has progressively gotten worse over the years as the stubble has gotten even harder with increased use of fertilisers and pesticides, resulting in cattle instinctively avoiding rice straw and increasing farmer costs by dulling implements when cutting this straw. In order for Delhi to breathe better, this farmer needs to personally incur the cost of pulling this stubble, collecting it, and then transporting it to a place where it can be disposed properly. The collected stubble is tricky to handle because it is high volume but low weight, occupies land to store and requires high transportation cost to move around. In short, we expect the farmer to pay and be a good citizen so that we breathe better. Are we really expecting that the farmer “will do the right thing” when his economics incentivises him to clear his field cost-effectively by simply setting it on fire and fertilising his fields in the process as well?

Policy-makers and residents need to abandon the hope that enforcement of stubble-burning bans is a solution. On a trip to Punjab last week, I understood how disaggregated this problem is when I saw that the fields being burnt were both very small and quite large making enforcement by arresting and fining violators en masse completely out of the question. In general, enforcement of laws is not our strength in India and such enforcement against the powerful farming lobby is simply not going to happen.

The only solution to this annual stubble burning nightmare lies in changing the economics of the farmer by making collection and disposal of stubble more rewarding than burning. The stubble is actually valuable biomass fuel that can generate renewable electricity. The supply of such stubble by farmers to power plants can be a source of additional income instead of becoming a cost. North India can certainly use and pay for more renewable energy to feed its economic growth. The farmer will happily collect the stubble if there was a profit to be had. What would unlock such a win-win solution?

The solution lies in either individual state governments like Delhi or preferably the Central government, through one of their power procurement agencies like Power Trading Corporation or NTPC offering an attractive power price to private power producers for electricity generated from this stubble. The power price offered needs to both justify making an investment in a new power plant and also enabling the power producer to pay a price to the farmer for the stubble that justifies its collection and transportation. Since speed is of the essence, the government should offer an early completion bonus for projects that come online within 36 months with the bonus reducing every year, thereby rewarding companies that deliver a quicker solution to our lungs.

The reason I know this will work is because I have seen it work in Thailand. When I started investing in biomass generation in Thailand in 2004, rice husk (a completely different product than stubble) was viewed as a nuisance product by rice mills and there were limited uses of this husk. The government of Thailand introduced the “Very Small Power Plant” scheme for biomass projects below 10 MW that offered very attractive tariffs. Within the space of five years, this waste rice husk had gone from fetching the rice mills a price that

barely recovered transportation cost to becoming a significant source of revenue and an essential source of profits for rice mill operations.

If Prime Minister Narendra Modi is serious about doubling farmer incomes and improving public health, finding a way to turn this agricultural waste into electricity in an environment-friendly manner is surely a starting point.

As an investor in renewable energy and climate finance in India for nearly two decades, I have seen how quickly capital has been mobilised in India and projects implemented when economics justifies the investment. India has seen more than \$42 billion invested in renewable energy since 2014, mainly in new solar and wind power plants, simply because the power price was considered sufficiently lucrative to justify the risks. A fraction of this capital can permanently solve the stubble burning crisis and the same players in renewable energy that are now larger and much better financed can be the executors of this strategy.

Like all environmental problems, no one person or state government can solve this problem on their own. The Centre has to take the lead and take along the state governments of not only the states that are the source of stubble burning but the states whose residents are breathing these toxic fumes. We should stop expecting the farmer to single-handedly pay for our clean air and accept that the right economic incentives are the only sustainable solution to this intractable problem. We need to finally put a price on our health and our lungs and open up our wallets to buy our way out of this annual crisis. Perhaps then, like Bill Murray in Groundhog Day, we will unexpectedly wake up one year and find that it really is a new year.

The writer is a senior private equity leader in renewable energy and climate finance in Asia and India. He is currently a Senior Advisor to Saron Asset Management, a Canadian private equity fund manager in climate finance

## **National Health Database**

### **Stack and blueprint — Building digital infrastructure for national health database (The Indian Express: 20190511)**

<https://indianexpress.com/article/explained/explained-stack-and-blueprint-building-digital-infrastructure-for-national-health-database-6103245/>

NHS is digital infrastructure built with the aim of making the health insurance system more transparent and robust, while factoring in the uniqueness of India's health sector, and the political realities of federalism.

National Digital Health Blueprint recognises the need to establish a specialised organisation, called the National Digital Health Mission (NDHM) that can drive the implementation of the blueprint, and promote and facilitate the evolution of a national digital health ecosystem.

With the launch last year of Ayushman Bharat, the world's largest state-funded health insurance programme, and the slow but certain progress towards Universal Health Coverage (UHC), the challenge of making quality and affordable healthcare accessible to every one of India's 135 crore citizens has acquired an altogether new dimension.

Effective use of technology is critical to this project — this is where the National Health Stack and its rulebook of sorts, the National Digital Health Blueprint, drawn up by a committee led by the former UIDAI chairman and Communications and I-T secretary J Satyanarayana, comes in. The Committee submitted its final report to Health Minister Harsh Vardhan last week.

So, what is the National Health Stack (NHS)?

Unveiled by the NITI Aayog last year, NHS is digital infrastructure built with the aim of making the health insurance system more transparent and robust, while factoring in the uniqueness of India's health sector, and the political realities of federalism. There are five components of NHS:

\*An electronic national health registry that would serve as a single source of health data for the nation;

\* a coverage and claims platform that would serve as the building blocks for large health protection schemes, allow for the horizontal and vertical expansion of schemes like Ayushman Bharat by states, and enable a robust system of fraud detection;

\* a federated personal health records (PHR) framework that would serve the twin purposes of access to their own health data by patients, and the availability of health data for medical research, which is critical for advancing the understanding of human health;

\* a national health analytics platform that would provide a holistic view combining information on multiple health initiatives, and feed into smart policymaking, for instance, through improved predictive analytics; and

\* other horizontal components including a unique digital health ID, health data dictionaries and supply chain management for drugs, payment gateways, etc., shared across all health programmes.

And what is the National Digital Health Blueprint (NDHB)?

The NDHB is the architectural document for the implementation of the NHS. Its vision is “to create a national digital health ecosystem that supports universal health coverage in an efficient, accessible, inclusive, affordable, timely and safe manner, through provision of a wide range of data, information, and infrastructure services, duly leveraging open, interoperable, standards-based digital systems, and ensuring the security, confidentiality and privacy of health-related personal information”.

The key features of the blueprint include a federated architecture, a set of architectural principles, a five-layered system of architectural building blocks, a unique health ID (UHID), privacy and consent management, national portability, electronic health records, applicable standards and regulations, health analytics and, above all, multiple access channels like call centres, Digital Health India portal, and the MyHealth app. A total of 23 such building blocks have been identified in the blueprint for the NHS to become a viable reality.

NDHB recognises the need to establish a specialised organisation, called the National Digital Health Mission (NDHM) that can drive the implementation of the blueprint, and promote and facilitate the evolution of a national digital health ecosystem.

But why is the NHS necessary?

Currently, apart from Ayushman Bharat-Pradhan Mantri Jan Arogya Yojana, there are many secondary and tertiary care schemes running in the states — such as Swasthya Sathi in West Bengal, Aarogyasri in Telangana, Chief Minister’s Comprehensive Health Insurance Scheme in Tamil Nadu, Mahatma Jyotiba Phule Jan Arogya Yojana in Maharashtra, etc.

West Bengal has opted out of Ayushman Bharat, and Telangana and Odisha have never been a part of the scheme.

Also, there is an urgent need for integration of the two arms of Ayushman Bharat — health and wellness centres which constitute the primary care arm, and PMJAY, which is the secondary and tertiary care arm under which the target is to provide 10.74 crore families with an annual health cover of Rs 5 lakh each. Without integration, the goal of continuum of care cannot be met — and that would mean PMJAY might end up becoming a perpetual drain on resources.

Hence, the need for a common digital language for the operationalisation and interoperability of various health schemes, which the NHS seeks to provide.

Is all the data going to be safe/secure?

One of the biggest concerns following the high-profile rollout of Ayushman Bharat has been regarding data security and privacy of patients. The concerns were aggravated after an Assam minister and a senior official of the National Health Authority posted patient details on Twitter.

More than a year after the Justice Srikrishna Committee prepared a draft data privacy law, there has been little meaningful movement on it. Critics have argued that in the backdrop of the Supreme Court's privacy judgment, the data privacy law should ideally have preceded the implementation of Ayushman Bharat.

The NDHB says: "The consent of the citizen plays a major role in ensuring that collection of data is done in a manner consistent with legal rights... It is also important to ensure that... the data captured is used and disclosed (in an identifiable or anonymised shape) in a manner appropriate in law and preserving the citizen-directed constraints."

### **Alzheimer's disease**

#### **China approves drug to cure Alzheimer's; to go on sale from next month (The Indian Express: 20191105)**

China's National Medical Products Administration has approved the market launch of the drug, GV-971, last Saturday which could treat the ailment in 17 years, state-run China Daily reported on Monday.

A home-grown drug in China for Alzheimer's, which could treat the ailment in 17 years, will be available to Chinese patients from next month after it was officially approved, its developers said.

China's National Medical Products Administration has approved the market launch of the drug, GV-971, last Saturday which could treat the ailment in 17 years, state-run China Daily reported on Monday.

Patients will be able to buy the drug around China from December 29, and more production lines will gradually be put into operation to satisfy the market demand, according to Shanghai Green Valley Pharmaceutical, one of the drug's developers.

The drug is the only Alzheimer's medicine out of more than 320 developed by pharmaceutical companies around the globe to survive clinical trials, despite the investment of hundreds of billions of US dollars over the past two decades, the report said.

Extracted from brown algae, the orally taken drug is the world's first multi-targeting and carbohydrate-based drug for Alzheimer's, the administration said.

It can treat mild to moderate forms of the disease and improve cognition, it said.

The first production line for the drug, which will meet the needs of two million patients, will begin running this week.

Alzheimer's disease, an irreversible and progressive brain disorder that slowly destroys memory, thinking ability and the capability to carry out simple tasks, affects at least 50 million people worldwide, and the number is expected to increase as populations age.

China has roughly 10 million people with Alzheimer's, the highest in the world.

The Chinese Academy of Sciences' Shanghai Institute of Materia Medica, which jointly developed the GV-971 with Green Valley and Ocean University of China after 22 years of research, said there were previously five medicines with limited efficacy used to treat the disease, which was discovered a century ago.

A phase III clinical trial of the drug involving 818 patients completed in July last year had "proven to continuously and effectively improve cognition among mild to moderate Alzheimer's disease sufferers over a period of nine months," said Geng Meiyu, lead researcher on the drug and a researcher with SIMM.

"Addiction and serious toxicity of the therapy haven't been identified in research so far," she said.

Scientists said the drug functions mainly by rebalancing gut microbiota, reducing neuro-inflammation and reducing cognitive impairment. Some doctors from home and abroad, including David Holtzman, chairman of the American Neurological Association, said they believe GV-971 will provide a new medical solution for patients.

Preparations are being made for the drug's clinical trials in the US and international multi-centre research, its developers said, with initial communication with the US Food and Drug Administration already completed.

"Green Valley has established a professional team and hired world-renowned experts in this field as consultants in preparation for initiating clinical trials in the US," said Lyu Songtao, the company's chairman.

"We don't exclude the possibility of collaborating with international research institutions to perform clinical trials in the US," the Daily report quoted Lyu as saying.

## **Malaria**

### **Malaria cases highest in five years, says SDMC (The Hindu: 20191105)**

<https://www.thehindu.com/news/cities/Delhi/malaria-cases-highest-in-five-years-says-sdmc/article29883382.ece>

Over 140 cases of chikungunya reported

A total of 617 malaria cases have been reported in the city so far this year, the highest in the past five years, as per data released by the South Delhi Municipal corporation (SDMC) on Monday. In the whole of 2018, 473 malaria cases were reported; in 2017, there were 577 cases, as per the data.

Meanwhile, a total of 833 dengue cases have been reported so far this year with 236 cases being registered in just the last week — the highest in a single week this year. However, the total number of dengue cases are lower than reported in the last four years. The number of chikungunya cases reported this year so far stands at 143, higher than the 133 cases reported during the same period in 2018.

## **Medicine**

### **Fusing traditional medicine with the modern (The Hindu: 20191105)**

<https://www.thehindu.com/opinion/op-ed/fusing-traditional-medicine-with-the-modern/article29881852.ece>

Alternative medicine background. EPS 10, no transparencies used. Placed on two layers: background color and icons.

Taking cues from the Chinese experience, India can integrate the education, research and practice of both systems

Revival of the Indian systems of medicine, which comprises Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy (AYUSH), served as one of the sub-themes of the cultural nationalistic reassertion in the early 20th century against the imperialistic British

reign. Little wonder then that there are high hopes that the Narendra Modi government and its seeming nationalistic ardour will spell good times for the perennially neglected alternative medicine sector, especially Ayurveda. Much in line with the expectations, a number of initiatives to promote AYUSH have been recently announced. This includes: creating AYUSH wings in defence and railway hospitals; giving soft loans and subsidies for the establishment of private AYUSH hospitals and clinics; and building institutes of excellence in teaching and research in AYUSH. Also, 12,500 dedicated AYUSH health and wellness centres are planned to be set up under the Ayushman Bharat mission. Here, two important areas presenting significant policy concerns and implications can be identified.

One persistent tendency in our key strategies to mainstream AYUSH medicine has been to regard that the problem lies simply in there being 'less' of AYUSH. Hence, integration of AYUSH into the health-care system has been largely conflated with having more number of AYUSH facilities or having them in place where there aren't any.

#### A fraught relationship

It is common knowledge that AYUSH's relationship with modern medicine has been fraught with multiple issues — including quackery by AYUSH practitioners; ridicule of AYUSH treatments and procedures by many; and mindless cosmeticisation and export promotion of AYUSH products. However, little by way of a concrete harmonising strategy has been devised to address these concerns. These issues are reflective of a sharp status gap between modern medicine and AYUSH that is highly detrimental for the optimal deployment of AYUSH resources. Merely expanding AYUSH's framework will only expand the present list of problems.

True integration would require a concerted strategy for facilitating meaningful cross-learning and collaboration between the modern and traditional systems on equal terms. This is the only way to address the subservient status of AYUSH and to foster its legitimate inclusion into mainstream health care. The Chinese experience of integrating Traditional Chinese Medicine with Western medicine makes for a good example. An Indian parallel could envision the integration of education, research, and practice of both systems at all levels. This can include training of AYUSH practitioners in modern medicine through curriculum changes and vice versa. However, this would entail substantial groundwork with respect to the prerequisites of such integration: namely, building a strong traditional medicine evidence corpus; delineating the relative strengths, weaknesses, and role of each system; negotiating the philosophical and conceptual divergences between systems; standardising and regulating AYUSH practices and qualifications; and addressing the unique issues associated with research into AYUSH techniques.

It is interesting to note that while China embarked upon the path in the 1950s, a solid road map to address the above challenges still fails to transcend political rhetoric in India.

Recently, the National Medical Commission Act, 2019 was passed in the face of much opposition from the orthodox medical community, apparently signifying political will. While an earlier proposal for a bridge course for AYUSH graduates was shelved, there is no reason

why the opposition to integration of traditional and modern systems cannot be nullified, particularly in view of the vast potential of AYUSH to contribute to universal health-care in India.

Historically, attempts at integration have been foiled by parties from both within and outside the AYUSH sector. In keeping with the recommendations of the Chopra Committee (1948), baby steps were taken to integrate the teaching of traditional and modern systems of medicines, proposals that were later scrapped. While the AYUSH lobby feared a loss of identity following such integration, the allopathic lobby alleged that standards of medical care would be diluted.

This kind of isolationist approach goes against the cherished ideal of modern medicine to embrace concepts that are backed by evidence. In the case of traditional medicine, an isolationist attitude could deter scientific scrutiny and block some potential value addition. An integrated framework should create a middle path — fusing the two systems, while still permitting some autonomy for each. Accordingly, a medium- and long-term plan for seamless integration should be developed expeditiously in view of the massive drive for achieving universal health care already under way in the country.

Dr. Soham D. Bhaduri is a Mumbai-based doctor and Editor of the journal ‘The Indian Practitioner’

## Medical Technology (The Asian Age: 20191105)

<http://onlinepaper.asianage.com/articledetailpage.aspx?id=14044771>

**KEY | INVENTION** Yale's research team develops skin that communicates, connects with human cells

# Living skin 3D-printed with blood vessels

**New York, Nov. 4:** A team led by an Indian-origin scientist has developed a novel way to 3D print living skin complete with blood vessels, a 'significant step' towards creating grafts that are more like the natural skin.

Three dimensional (3D) bioprinting combines cells, growth factors, and biomaterials to fabricate biomedical parts that maximally imitate natural tissue characteristics.

"Right now, whatever is available as a clinical product is more like a fancy Band-Aid," said Pankaj Karande, an associate professor at Rensselaer Polytechnic Institute in the US.

"It provides some accelerated wound healing, but eventually it just falls off. It never really integrates with the host cells," said Karande, who led the research published in the journal *Tissue Engineering Part A*.

Researchers noted that a significant barrier to that integration has been the absence of a functioning vascular system in the skin grafts.

The team found that if they add key elements — including human endothelial cells, which line the inside of blood vessels, and human pericyte cells, which wrap around the endothelial cells — with animal collagen and other structural cells typically found in a skin graft, the cells start communicating.

Such cells form a biologically relevant vascular structure within the span of a few weeks, according to the researchers.

When a team at Yale School of Medicine in the US grafted the structure onto a special type of mouse, the vessels from the 3D printed skin began to communicate and connect with the mouse's own vessels.

"That is extremely important, because we know there is actually a transfer of blood and nutrients to the graft which is keeping the graft alive," Karande explained.

In order to make this usable at a clinical level, researchers need to be able to edit the donor cells using something like the CRISPR gene-editing technology, so that the vessels can integrate and be accepted by the patient's body.

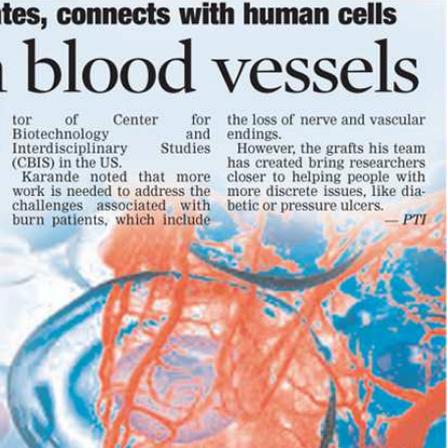
"We are still not at that step, but we are one step closer," Karande added.

"This significant development highlights the vast potential of 3D bioprinting in precision medicine, where solutions can be tailored to specific situations and eventually to individuals," said Deepak Vashishth, the director of Center for Biotechnology and Interdisciplinary Studies (CBIS) in the US.

Karande noted that more work is needed to address the challenges associated with burn patients, which include the loss of nerve and vascular endings.

However, the grafts his team has created bring researchers closer to helping people with more discrete issues, like diabetic or pressure ulcers.

— PTI



## **Bowel Cancer**

### **Study zeroes in on gut bacteria that may cause bowel cancer (Medical News Today: 20191105)**

<https://www.medicalnewstoday.com/articles/326910.php>

Scientists have identified a certain type of gut bacteria that may raise the risk of bowel cancer by up to 15%. The research method used in the new study indicates that these gut bacteria may likely play a causal role in the development of this form of cancer.

Scientists have homed in on a bacterial group that may cause colorectal cancer.

Over 100,000 new cases of colon cancer and more than 44,000 new cases of rectal cancer will have developed in the United States in 2019, according to the American Cancer Society.

Colorectal cancer, also known as bowel cancer, is the third leading cause of cancer death in both men and women. And, according to the National Cancer Institute, about 4.2% of men and women will receive a diagnosis of it at some point.

Although medical researchers have not yet unraveled the causes of bowel cancer, experts recognize that a few factors can raise a person's risk.

Being overweight or obese, not being physically active, smoking, or eating a lot of red meat and fried foods are some modifiable risk factors, that is, factors that one can change by making more healthful lifestyle choices.

Being older than 50 and having a personal or family history of bowel cancer, colorectal polyps, or inflammatory bowel disease can also influence risk.

New research adds an element to the list of risk factors: gut bacteria. In fact, the new study goes beyond merely finding associations and suggests that certain bacteria in our guts may cause colorectal cancer.

Kaitlin Wade, Ph.D., from the University of Bristol, in the United Kingdom, is the lead author of the new research, which she presented at the National Cancer Research Institute Cancer Conference in Glasgow.

Looking for causality

Wade and the team examined data from 3,890 people who had participated in any of three genome-wide association studies: the Flemish Gut Flora Project, the German Food Chain Plus study, and the PopGen study.

Additionally, the team analyzed data from 120,328 people in the international Genetics and Epidemiology of Colorectal Cancer Consortium.

Genome-wide association studies compare genomes to look for variations in the genomes of people who have a certain condition.

Do gut bacteria affect bowel cancer development?

A large meta-review of existing studies investigates.

However, the authors of the current study wished to go further than studying mere association. "Lots of studies in mice and humans have shown an association between the gut microbiome and bowel cancer," explains Wade, "but very few have provided convincing evidence for causality."

"In other words, it's really difficult to discern whether components of the gut microbiome can cause bowel cancer, whether the disease itself leads to variation in the gut microbiome, or whether the association is due to some other factors that cause variation in both."

Kaitlin Wade, Ph.D.

To rectify this, the researchers applied Mendelian randomization — a complex statistical method that analyzes data from large population samples to find evidence that suggests causation rather than correlation.

Mendelian randomization "uses genetic variation as a natural experiment" to examine the causal relationships between risk factors and health outcomes in observational data.

Wade explains, "With Mendelian randomization, we use people's natural, randomly inherited genetic variations, which alter levels of bacteria within the gut microbiome, in a way that mimics a randomized trial."

This enables the researchers to analyze whether those with a different genetic makeup and gut microbiome "have a different risk of colorectal cancer."

"In this way, we don't have to edit anyone's gut microbiome directly by giving antibiotics or probiotics in a randomized trial or waste time waiting to see whether people within the population get colorectal cancer. We just need studies that have already got this information measured," she explains.

Mendelian randomization is also less prone to biases, such as confounding factors and reverse causation.

Bacterial group may cause bowel cancer

The study revealed that "an unclassified type of bacteria from a bacterial group called Bacteroidales increased the risk of bowel cancer by between 2–15%," reports Wade.

"We were able to use Mendelian randomization to understand the causal role that these bacteria may have on the disease," she says.

"Our findings support previous studies that have shown that Bacteroidales bacteria are more likely to be present, and in larger quantities, in individuals with bowel cancer, compared to those without the disease."

Kaitlin Wade, Ph.D.

However, Wade explains, much more research is necessary before firmer conclusions can be drawn.

For instance, researchers "need to classify the exact species or strain of bacteria in the Bacteroidales group, and [...] do more work to understand how and why human genetic variation can alter the gut microbiome."

Furthermore, the scientist adds, even if additional studies reinforce the conclusion that these bacteria do cause bowel cancer, researchers would still need to investigate what effects interfering with these bacteria would have on other health outcomes.

## **Breast Cancer**

**Breast cancer: An innovative blood test could aid early detection (Medical News Today: 20191105)**

<https://www.medicalnewstoday.com/articles/326905.php>

Researchers are developing a blood test that could help detect breast cancer 5 years before any symptoms become apparent. This method would also be less uncomfortable and more cost effective than traditional mammograms.

Can a new blood test improve breast cancer detection?

According to the World Health Organization (WHO), breast cancer is the most common type of cancer in women all around the globe.

That said, most types of breast cancer are very treatable, and survival rates are high for those whose cancer doctors detect early and treat immediately.

However, breast cancer does not always produce obvious symptoms at an early stage, which can lead to late detection and affect the effectiveness of treatment.

Recently, researchers from the University of Nottingham in the United Kingdom hypothesized that a blood test that screens for the presence of certain antibodies could help detect breast cancer early and easily.

They explain that when cancer is present, it produces antigens. These are substances that induce an immune response. The immune system then tries to counteract these substances by releasing autoantibodies.

So, the team started developing a blood test that would be able to detect those autoantibodies in the blood and indicate whether or not breast cancer is present.

They first developed panels of tumor-associated antigens (TAAs) specific to breast cancer. This allowed them to screen for the presence of autoantigens in blood that are associated with a response to breast cancer-specific TAAs.

Tests show 'reasonable accuracy'

For the new study, the researchers collected blood samples from 90 people with breast cancer and 90 volunteers without cancer (the controls).

The researchers used specialized screening methods to look for autoantibodies generated against 40 TAAs they already knew were associated with blood cancer and 27 TAAs that were not known to have a link with this type of cancer.

How does tumor size relate to breast cancer stage?

"The results of our study showed that breast cancer does induce autoantibodies against panels of specific [TAAs]," says study co-author Daniyah Alfattani, a doctoral researcher at the University of Nottingham.

She adds that they "were able to detect cancer with reasonable accuracy by identifying these autoantibodies in the blood." This innovative blood test could help specialists detect the presence of breast cancer up to 5 years before any visible symptoms occur.

Alfattani has recently presented these results at the 2019 National Cancer Research Institute conference. This year, the event took place in Glasgow, U.K.

In total, the team developed three panels of TAAs that allowed them to screen for autoantibodies that respond to them. And, the investigators note, the more TAAs present in a panel, the more accurate the blood test results.

The panel featuring five TAAs facilitated the correct detection of breast cancer in 29% of the samples from people with breast cancer. It also confirmed the lack of breast cancer in 84% of the samples from the control group.

The panel featuring seven TAAs allowed for the correct detection of breast cancer in 35% of the samples collected from people with cancer, and it confirmed the lack of cancer in 79% of the samples from people without cancer.

Finally, the panel containing nine TAAs led to the detection of cancer in 37% of the samples from individuals with breast cancer, and it confirmed the lack of cancer in 79% of the control samples.

"We need to develop and further validate this test," says Alfattani. "However, these results are encouraging and indicate that it's possible to detect a signal for early breast cancer."

"Once we have improved the accuracy of the test, then it opens the possibility of using a simple blood test to improve early detection of the disease."

Daniyah Alfattani

The researchers are now taking this mission forward by testing blood samples from 800 people with breast cancer against a panel of nine TAAs. This, they hope, will lead to higher accuracy in the test results.

"A blood test for early breast cancer detection would be cost effective, which would be of particular value in low and middle income countries. It would also be an easier screening method to implement compared [with] current methods, such as mammography," explains Alfattani.

The team believes that should this research obtain full funding in the near future, the test might become available to the public within the next 4–5 years.

Similar tests are in development for other types of cancer, including lung, pancreatic, colorectal, and liver cancers.

## **Depression**

**Metacognitive therapy may prevent depression relapse (Medical News Today: 20191105)**

<https://www.medicalnewstoday.com/articles/326889.php>

Ending the cycle of negative thought rumination is the premise of a depression treatment called metacognitive therapy. New findings suggest that it may be more beneficial in stopping depression relapse than other more commonly used methods.

New research suggests that a new form of therapy called metacognitive therapy may prevent depression from returning.

Depression is a huge global health issue. As the leading cause of disability in the United States for those between the ages of 15 and 44 years, it has a significant effect on individuals and society as a whole.

With more than 300 million people currently living with depression, finding a long lasting treatment is vital. Unfortunately, relapses are common.

Treatments, which include cognitive behavioral therapy (CBT) and medication, can work well in the short term, but many people's symptoms return either within a few months or later on in life.

In fact, only about 30% of people with depression have not relapsed 18 months after the end of their treatment.

The findings of the new study, which features in *Frontiers in Psychology*, provide early evidence of the benefits of metacognitive therapy.

Not only is recovery more likely using this treatment method, according to the authors, but people may find it less taxing.

While CBT requires a person to delve into their previous worries, metacognitive therapy teaches people not to concentrate on negative thoughts.

"Most of us have negative thoughts; we think we're not good enough, or we don't accomplish what we want to," explains Prof. Odin Hjemdal, who works in the department of psychology at Norwegian University of Science and Technology in Trondheim.

"But only [a] few people get clinically depressed because most of us can put aside our repeating thoughts, rather than getting stuck in them."

"What perpetuates depression," he adds, "is that you get stuck in a thought pattern and ruminate about the same thing over and over."

By becoming aware of this process, people can choose a different and less damaging path to tread.

### Significant improvements

In the study, the researchers offered 39 participants with major depression 10 sessions of metacognitive therapy.

They then divided the participants into two groups. The participants in the first group received metacognitive therapy immediately, whereas those in the second group had to wait 10 weeks to begin treatment.

### Study challenges link between depression and inflammation

Scientists apply complex statistical models and find that the link between inflammation and depression is flimsier than experts previously believed.

During this waiting period, two people dropped out. A total of 34 participants took part in a follow-up assessment a year later, which involved filling out a questionnaire at home.

The assessment showed that 1 year after metacognitive therapy, the team still classified between 67% and 73% of the participants as recovered.

Different measuring techniques — one taking into account all of the original participants and the other one only analyzing those who completed the questionnaire — provided the two different percentages.

The researchers also noted significant recovery among those with severe symptoms. Of those with severe depression, 79% had recovered at the follow-up, compared with 60% of those with moderate depression.

Only 15% of the participants had seen no change a year after treatment, while just 13% of recovered individuals had relapsed within the year.

The rest saw some signs of improvement. There was also a notable reduction in anxiety among the overall group.

What we still do not know

"We're a little surprised, but we're really happy that it's turned out this way," says Prof. Hjemdal. "To us, it seems that when patients crack the code and manage to change their thinking styles and patterns, they stay healthy."

"But," he adds, "there's still more we need to know." For example, researchers will need to study the long term effects of metacognitive therapy and compare it with other available treatments, as well as ensuring that diagnostic criteria are in place for follow-up assessments.

Although the study included an almost equal number of men and women (59% of the participants were female), its small sample size means that larger scale studies are necessary before scientists can form any strong conclusions.

Despite all this, Prof. Hjemdal believes that "[a]s a society, we could save a lot of money and spare people a lot of personal suffering if we provide metacognitive therapy treatment to help individuals with depression."