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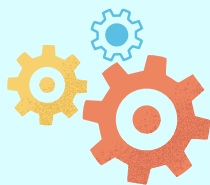
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Scientists Develop Smart Health Tracker for High-Altitude Yaks



A team of Indian scientists has developed an Internet of Things (IoT)-based smart monitoring system to track the health, stress levels, and movement of high-altitude yaks in the Himalayas. The technology aims to improve yak management in remote mountain regions while helping monitor livestock movement near India's international borders.

The Indian yak (*Bos grunniens*), often called the "ship of the Himalayas," is essential to the livelihoods of mountain communities. These hardy animals thrive at altitudes above 8,000 feet and provide meat, milk, wool, and transportation. According to the 20th Livestock Census, India has around 58,000 yaks, with nearly half found in Ladakh. The remaining population is distributed across Arunachal Pradesh, Sikkim, Himachal Pradesh, and Uttarakhand.

Monitoring yaks in the rugged Himalayan terrain has long been a major challenge. Farmers, known as brokpas, often struggle to track animals grazing across vast, inaccessible landscapes, especially near international border areas. Detecting illness or stress early is also difficult due to the remoteness of these regions.

To address these challenges, researchers developed a collar-mounted IoT device that continuously monitors the animals. The system combines health monitoring with geo-fencing, allowing farmers to track the location of yaks and receive alerts if they move beyond designated grazing areas.

The innovation was led by Mihir Sarkar, Director of the Indian Council of Agricultural Research's National Research Centre on Yak (NRC-Y) in Dirang, Arunachal Pradesh.

The research team also included NRC-Y scientists Mokhtar Hussain, Vijay Paul, and Dinamani Medhi, in collaboration with Rupesh Mandal, Nupur Choudhury, Gitu Das, and Jyoti Kumar Barman from Assam Don Bosco University, Guwahati.

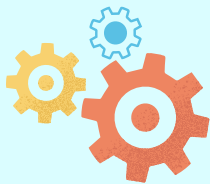
The IoT-based system uses sensors, software, and wireless connectivity to collect and transmit real-time data without constant human intervention. It monitors key health indicators, predicts stress levels, and records movement patterns, enabling farmers to identify potential health issues early and seek timely veterinary care.

Geo-fencing technology creates virtual boundaries using GPS and other location-based services. If an animal moves beyond the predefined area, the system can alert farmers, making it easier to manage herds spread across difficult terrain and reducing the risk of animals straying into restricted or border regions.

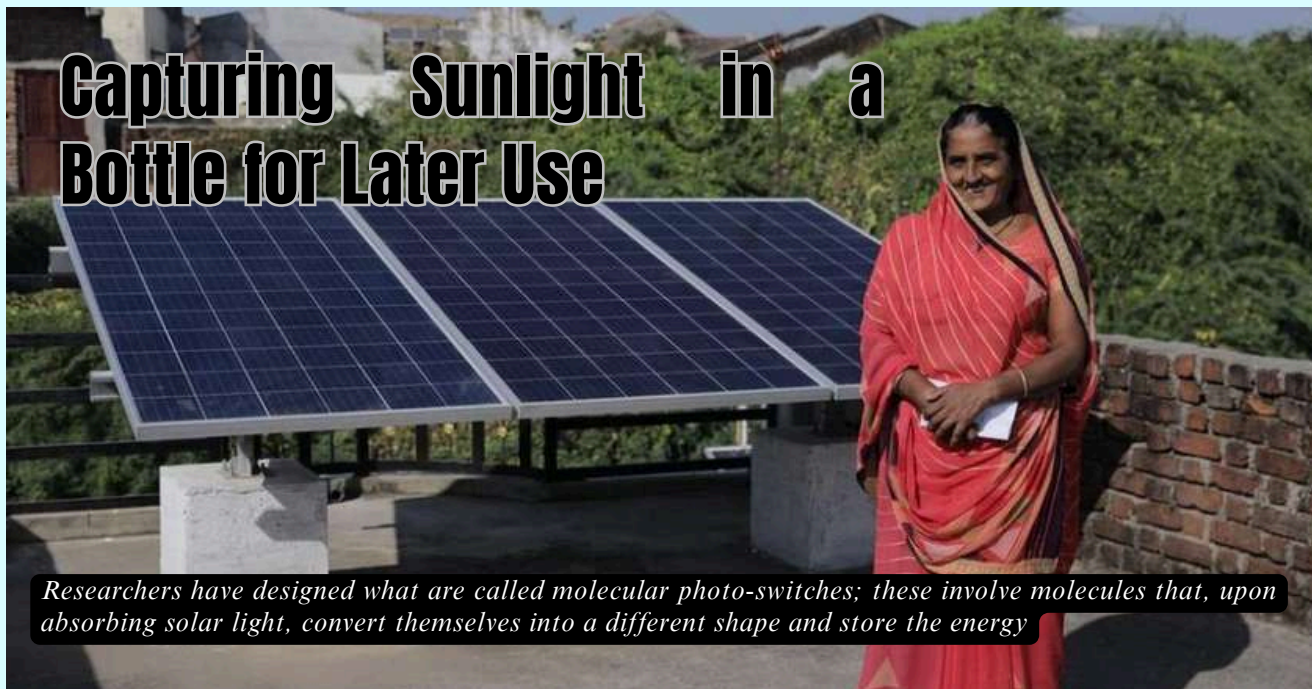
According to Dr. Sarkar, yaks remain a critical source of livelihood for Himalayan communities, but traditional herd management is challenging due to harsh weather, difficult terrain, and limited accessibility. The new technology offers a practical solution by providing real-time information on animal health and location, helping farmers make informed decisions and improve overall herd management.

The smart tracking system is expected to enhance yak welfare, reduce livestock losses, support timely medical intervention, and strengthen sustainable livestock management in the high-altitude Himalayan region.

Source: https://www.thehindu.com/news/national/scientists-develop-health-tracker-for-high-altitude-yaks/article71190428.ece?cx_testId=11&cx_testVariant=cx_1&cx_artPos=0&cx_experienceId=EXKWL3XAQS9E&cx_experienceActionId=showRecommendationsWZ26ZFU3B6UO9#cxrecs_s, <https://www.thehindu.com>



Capturing Sunlight in a Bottle for Later Use



Global efforts led by UNESCO and the United Nations Framework Convention on Climate Change (UNFCCC) have encouraged countries to adopt cleaner energy solutions to reduce carbon emissions. Among these, solar power has emerged as one of the most successful renewable energy technologies. Across India, rooftop and large-scale solar installations are expanding rapidly, making clean electricity more accessible.

Under the Surya Ghar Muft Bijli Yojana, a typical grid-connected rooftop solar system costs around ₹30,000 per kW after subsidies. A 2-kW system can meet the basic electricity needs of an average household. India currently has about 23 GW of rooftop solar capacity and nearly 150 GW of total land-based solar power generation. Additional capacity is expected from innovative projects such as floating solar plants and canal-top solar installations. Along with wind energy and the growing adoption of electric vehicles, these developments are helping India transition toward a greener future.

Solar panels generate electricity by converting sunlight into electrical energy. When sunlight strikes silicon cells, photons excite electrons, creating an electric current that is converted into usable alternating current through inverters. However, solar panels produce electricity only when sunlight is available. Although batteries can store excess energy for later use, they significantly increase installation costs.

A promising alternative has been developed by researchers at the University of California, Santa Barbara, led by Prof. Grace Han.

They have designed molecular photo-switches—special molecules that absorb sunlight, change their molecular structure through a process called isomerisation, and store solar energy in chemical form. This technology, known as Molecular Solar Thermal (MOST) energy storage, enables sunlight to be captured and released as heat whenever needed.

The research team selected an alkaloid called 2-pyrimidone, which transforms into a high-energy isomer known as Dewar pyrimidone after absorbing sunlight. Because this isomer is highly strained, it can later release the stored energy as heat, delivering up to 1.65 million joules of energy per kilogram of MOST material. This stored heat could be used for applications such as water heating, cooking, and other domestic or industrial purposes.

Unlike conventional silicon solar panels, which mainly absorb red and near-infrared light (400–1,100 nm), MOST molecules capture energy from shorter ultraviolet wavelengths below 500 nm. This allows them to complement existing solar technologies rather than replace them.

Researchers believe that, besides pyrimidones, many other compounds could serve as effective molecular photo-switches. Continued research and large-scale production of these materials could make solar energy storage more efficient and affordable. By integrating MOST technology with rooftop solar systems, India could enhance renewable energy use, reduce dependence on conventional storage methods, and take another significant step toward a sustainable and low-carbon future.

Source: <https://www.thehindu.com/sci-tech/science/capturing-sunlight-in-a-bottle-and-using-it-when-needed/article71128985.ece>, <https://www.thehindu.com>



IIT Guwahati Researchers Develop Eco-Friendly Method to Remove Lead from Contaminated Water

A team of researchers from the Indian Institute of Technology Guwahati (IIT Guwahati) has developed a sustainable biological material capable of removing lead from contaminated water. The innovation offers an environmentally friendly and cost-effective alternative to conventional water treatment technologies, addressing one of India's major public health and environmental challenges.

The research, led by Professor Debasish Das from the Department of Biosciences and Bioengineering, demonstrates that cyanobacteria, commonly known as blue-green algae, can effectively absorb lead from polluted water. These microorganisms are naturally abundant in ponds, lakes, reservoirs, paddy fields, and other slow-moving freshwater bodies across India, making them an easily accessible and renewable resource.

The study was co-authored by Professor Tapas Kumar Mandal from the Department of Chemical Engineering and postdoctoral researcher Abhijeet Mahana. Their findings were published in the Journal of Environmental Chemical Engineering.

The researchers identified exopolysaccharides (EPS), a sticky, sugar-rich substance produced by cyanobacteria, as the key component responsible for lead removal. Laboratory experiments showed that EPS can remove up to 66.2% of lead from contaminated water. Naturally occurring chemical groups within EPS bind with lead ions, while the algae also adapt their chemical composition to enhance lead absorption, improving the efficiency of the process.

Beyond water purification, cyanobacteria provide additional environmental benefits. They can associate with fungi to form cyanolichens, fix atmospheric nitrogen, improve soil fertility, and act as natural biofertilizers, contributing to sustainable agricultural practices.

The research team is now working on developing a scalable treatment system capable of continuously removing lead and other toxic metals from industrial wastewater and contaminated water sources. Such a system could provide an affordable and sustainable solution for large-scale water treatment applications.

Lead contamination remains a serious public health concern in India. According to a 2020 report by UNICEF and Pure Earth, more than 275 million children in the country have blood lead levels above safe limits. In addition, the Central Ground Water Board has reported that 20–30% of groundwater samples collected from major Indian cities exceed the World Health Organization's recommended limits for lead in drinking water.

Conventional methods for removing heavy metals, including chemical precipitation, membrane filtration, and ion exchange, are often expensive, energy-intensive, and generate secondary pollutants. In contrast, the IIT Guwahati team's biological approach is renewable, environmentally friendly, and potentially more economical. By harnessing naturally occurring blue-green algae, this technology has the potential to improve water quality while reducing treatment costs and environmental impacts, making it a promising solution for addressing heavy metal pollution in India and beyond.



Understanding the Disappearance of the Egyptian Vulture in Tamil Nadu

Once a common sight in villages, temple towns, grazing lands and rocky cliffs across south India, the Egyptian Vulture (*Neophron percnopterus*) has almost vanished from Tamil Nadu. Once abundant in the Nilgiris, the species is now locally extinct there and no longer has any confirmed breeding population in the State. Conservationists warn that fewer than 150 resident birds remain across Tamil Nadu and Karnataka, underscoring the urgent need for coordinated conservation measures, including the establishment of an Egyptian Vulture Conservation Breeding Programme in Tamil Nadu.

Globally listed as Endangered by the International Union for Conservation of Nature (IUCN), the Egyptian Vulture is among the world's smallest vultures. India supports the resident subspecies *Neophron percnopterus ginnianus*, while migratory birds from Africa and the Middle East also winter in the country. As nature's scavenger, the species plays a vital ecological role by disposing of animal carcasses, reducing disease risks and maintaining healthy ecosystems. It also shares a long cultural association with temples and rural communities across peninsular India.

Historical records highlight the bird's former abundance. British ornithologist William Ruxton Davison described it as "very abundant" in the Nilgiris in 1883, particularly around Ootacamund and Badaga villages. Later records and photographs, including a 1906 image of temple priests feeding Egyptian Vultures at Tirukazhukundram, further document its close association with people. The last confirmed breeding evidence in Tamil Nadu came in 2008, when an adult with a chick was photographed at Devarabetta near Thally.

Experts attribute the species' decline to multiple factors, including poisoning from veterinary drugs such as diclofenac, electrocution on power lines, accidental poisoning, disturbance at nesting cliffs and declining food availability resulting from changing livestock-rearing practices. The gradual decline of traditional pastoral communities in the Nilgiris also reduced livestock carcasses that once sustained vulture populations.

According to the Bombay Natural History Society (BNHS), no active breeding sites are currently known in Tamil Nadu. While a few migrant Egyptian Vultures continue to winter in areas such as Chennai, Tirunelveli and Koonthankulam Bird Sanctuary, the resident breeding population has virtually disappeared. Conservationists describe the species as "functionally extinct" in the State, although unconfirmed reports suggest a single nesting pair may still survive.

Karnataka now supports the most significant remaining breeding populations in south India, particularly in the rocky hills of Ramanagara, along with parts of Mysuru, Bandipur, Ballari and Raichur. These populations are critical for the species' survival in the region.

Recognising the urgency, BNHS has proposed establishing an Egyptian Vulture Conservation Breeding Programme in Tamil Nadu. The initiative recommends setting up a dedicated breeding facility in suitable landscapes such as the Nilgiris, Dharmapuri, Krishnagiri and Coimbatore. The proposal builds on BNHS's successful conservation breeding programmes for other threatened vultures in Haryana, West Bengal, Madhya Pradesh and Assam.

Conservationists emphasise that captive breeding alone will not secure the species' future. Long-term recovery will require habitat protection, safe food sources, mitigation of electrocution and poisoning risks, and coordinated action involving the Forest Departments of Tamil Nadu, Karnataka, Andhra Pradesh and Telangana, alongside scientists, conservation organisations and local communities.

Source: <https://www.thehindu.com/sci-tech/energy-and-environment/understanding-the-disappearance-of-egyptian-vulture-in-tamil-nadu/article71193097.ece>, <https://www.thehindu.com/>



Environment



Beekeeping Initiative in Pichavaram Mangroves Offers Sustainable Livelihood to Irula Tribals

A new conservation-based livelihood initiative is taking shape in the Ramsar-listed Pichavaram mangrove ecosystem, integrating tribal welfare, biodiversity conservation and climate resilience. The project aims to provide sustainable livelihoods for the Irula tribal community while strengthening mangrove conservation through scientific beekeeping.

Implemented by the Tamil Nadu Forest Department through the Eco-Tourism Management Committee (ETMC) under the Climate Resilient Village (CRV) initiative, the project is funded by the National Bank for Agriculture and Rural Development (NABARD) under its TRIBES scheme at a cost of ₹25.37 lakh.

As part of the initiative, 250 bee boxes will be installed across the mangrove ecosystem, benefiting 100 Irula tribal households (around 200 individuals). Traditionally dependent on fishing, crab collection and wild honey gathering, Irula families will now receive scientific training in beekeeping, enabling them to diversify their income while contributing to the conservation of the unique mangrove habitat.

According to Cuddalore Collector Sibi Adhithya Senthil Kumar, the programme builds on the Irula community's long-standing relationship with the Pichavaram mangroves by combining traditional knowledge with modern, sustainable livelihood practices.

The project includes a three-phase capacity-building programme comprising basic training, reskilling and advanced training through eight structured modules. It aims to develop skilled beekeepers, promote women-led micro-enterprises and encourage youth to become eco-livelihood entrepreneurs.

Beyond honey production, the initiative adopts a complete value-chain approach. According to S. Manivel, Green Fellow, Department of Environment and Climate Change, the programme covers scientific beekeeping, honey extraction, hygienic processing, quality testing, value addition, branding, eco-friendly packaging and market linkages to maximise returns for tribal producers.

The honey will be sold under the premium brand "Pichavaram Mangrove Honey" through eco-shops, tourism outlets, exhibitions and digital platforms, helping establish a distinctive local product with higher market value.

Apart from generating income, the initiative is expected to enhance pollination, support natural mangrove regeneration, strengthen biodiversity and improve the ecological resilience of the Pichavaram mangrove ecosystem. By increasing pollinator populations, the project is expected to contribute to the long-term health and regeneration of this ecologically significant wetland.

According to NABARD Assistant General Manager Sasikumar, the initiative will provide participating families with a stable supplementary income beyond seasonal fishing while creating a premium local honey brand.

Forest Department officials describe the project as a replicable model for other coastal ecosystems. By combining indigenous knowledge, scientific innovation and institutional support, the initiative demonstrates how community-based conservation can simultaneously improve rural livelihoods and protect fragile ecosystems, offering a sustainable pathway for both people and nature.

Source: <https://www.thehindu.com/news/national/tamil-nadu/beekeeping-initiative-in-pichavaram-mangroves-a-sweet-livelihood-for-irula-tribals/article71188399.ece>, <https://www.thehindu.com/>



AGRICULTURE

Kerala Agricultural University releases five high-yielding crop varieties

New chilli, brahmi, vetiver, ginger and turmeric varieties promise higher yields, superior quality and better returns for farmers

The Kerala Agricultural University (KAU) has released five new crop varieties tailored to the State's agro-climatic conditions after receiving approval from the 29th Kerala State Seed Sub-Committee.

The newly released varieties—KAU Thejaswini (chilli), KAU Medha (brahmi), KAU Sougandhika (vetiver), KAU Cochin Pride (ginger), and KAU Golden Finger (turmeric)—have been developed to deliver higher yields, improved quality and enhanced profitability for farmers.

The varieties were approved by the committee, chaired by Agricultural Production Commissioner and Principal Secretary (Agriculture) Tinku Biswal, in June 2026.

KAU Thejaswini, developed by Sharada S., Associate Professor and Head of the Department of Vegetable Science at the College of Agriculture, Vellayani, is a long-fruited, high-yielding chilli variety recommended for cultivation across Kerala. The bushy plants bear smooth, glossy fruits that are dark green at maturity and turn bright red upon ripening. The variety has medium pungency, exhibits field tolerance to viral diseases and bacterial wilt, and records an average yield of 32.5 tonnes per hectare. It has also received good consumer acceptance.



KAU Medha (brahmi)

KAU Medha, a new brahmi (*Bacopa monnieri*) variety developed by Ancy Joseph, Professor and Head of the Aromatic and Medicinal Plants Research Station, Odakkali, is particularly suited to central Kerala. The variety combines high biomass production with elevated bacoside content, the key medicinal compound in brahmi. The creeping plant develops light brown anthocyanin pigmentation on its stems about 80 days after planting and yields 34–36 tonnes of fresh herbage and 5–6 tonnes of dried produce per hectare under open, well-lit conditions.



KAU Sougandhika (vetiver)



AGRICULTURE

Dr. Joseph has also developed KAU Sougandhika (ODV 27), a new vetiver (ramacham) variety with an essential oil content of 1.4%. It is characterised by vigorous growth, profuse tillering, delayed flowering and high root yield. The variety produces thick, long, aromatic roots, yielding 6.1–7.8 tonnes of dry roots per hectare, and is recommended for cultivation in the open areas of central Kerala for root and essential oil production.



KAU Cochin Pride (ginger)

KAU Cochin Pride, a ginger variety developed by Nair Sunil Appukuttan, Assistant Professor in the Department of Plantation Crops and Spices at the College of Agriculture, Vellanikkara, retains the distinctive pungency and aroma of traditional Cochin ginger while offering higher zingiberene and starch content. The variety matures in 240–245 days, is resistant to rhizome rot, and is suitable for cultivation as both a sole crop and an intercrop in coconut plantations. Producing large rhizomes with strong market acceptance, it records an average yield of 36.3 tonnes per hectare and has been recommended for dry ginger production in Kottayam and Idukki districts.



KAU Golden Finger (turmeric)

KAU Golden Finger (KAU AFT 31), also developed by Dr. Appukuttan with financial support from the Directorate of Arecanut and Spices Development, Kozhikode, is a high-curcumin (8.65%) Alappy Finger turmeric variety. Featuring deep orange flesh, export-quality rhizomes and high productivity, the variety matures in 240–250 days and yields 39–42 tonnes of fresh turmeric per hectare. It has been recommended for cultivation in Kottayam district.

Source: <https://www.thehindu.com/news/national/kerala/kerala-agricultural-university-releases-five-new-high-yielding-crop-varieties/article71206602.ece>, <https://www.thehindu.com/>



Sleep and Pain: An Intimate, Complicated Relationship

Sleep and pain share a close, two-way relationship. Chronic pain often disrupts sleep, causing frequent awakenings, lighter sleep, and poor sleep quality. In turn, inadequate sleep increases pain sensitivity the next day, creating a vicious cycle that is difficult to break.

Sleep is far more than a period of rest. It is an active biological process during which the body repairs tissues, restores hormonal balance, strengthens the immune system, consolidates memory, and clears toxins from the brain. These restorative functions are regulated by the body's circadian rhythm—its internal 24-hour biological clock—which governs the sleep-wake cycle, metabolism, body temperature, immune function, and even pain perception. Therefore, both the quality and timing of sleep are as important as its duration.

India is facing a growing epidemic of sleep deprivation. Surveys indicate that nearly 59% of Indians sleep for less than six uninterrupted hours each night. Long working hours, shift work, excessive screen exposure, changing lifestyles, and environmental noise have all contributed to chronic sleep debt, which worsens conditions such as back pain, headaches, arthritis, joint disorders, and post-injury pain. Beyond health, poor sleep also affects productivity, road safety, and mental well-being.

Research suggests that sleep deprivation may have an even greater impact on pain than pain itself has on sleep. Insufficient sleep weakens the body's natural pain-control mechanisms, lowers the pain threshold, and increases pain sensitivity (hyperalgesia).

It also triggers inflammation, disrupts emotional regulation, reduces endorphin production, delays tissue healing, and elevates stress hormones, making pain feel more intense and harder to tolerate. Even a single night of inadequate sleep can significantly increase pain perception.

Because of this strong connection, improving sleep should be a key component of pain management. Studies suggest that sleep-deprived individuals may respond less effectively to pain medications and may require higher doses for adequate relief. Chronic pain conditions such as arthritis, low back pain, neck pain, diabetic neuropathy, fibromyalgia, complex regional pain syndrome, and cancer-related pain are best managed through a multidisciplinary approach that includes assessment and treatment of sleep disorders.

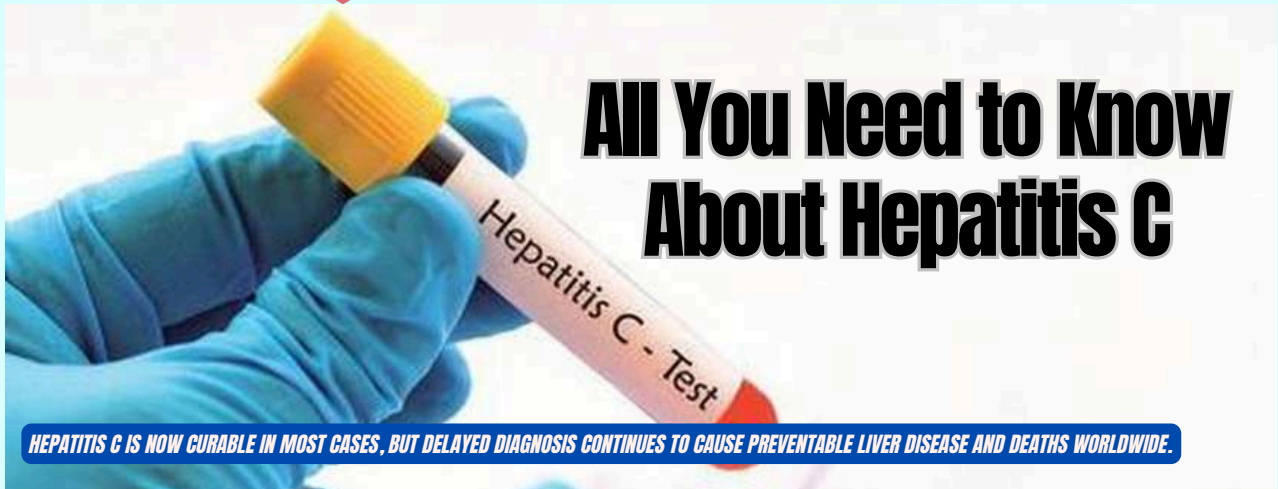
Healthy sleep habits begin during the day. Regular exposure to morning sunlight, physical activity, a balanced diet, and consistent meal timings support healthy sleep. In the evening, avoid excessive screen time, caffeine, and alcohol close to bedtime. Maintain a regular sleep schedule, create a calm and comfortable sleep environment, and practise relaxation techniques such as yoga, meditation, or deep breathing. For persistent insomnia, Cognitive Behavioural Therapy for Insomnia (CBT-I) and medications, when appropriate, should be guided by a sleep medicine specialist.

Sleep is one of the most effective, affordable, and side-effect-free tools for managing chronic pain. Prioritising restful sleep can reduce pain, improve resilience, and enhance overall quality of life. Alongside appropriate medical care and psychological support, good sleep is an essential pillar of effective pain management.

Source: <https://www.thehindu.com/sci-tech/health/sleep-and-pain-an-intimate-complicated-relationship/article71200866.ece>



HEALTH



HEPATITIS C IS NOW CURABLE IN MOST CASES, BUT DELAYED DIAGNOSIS CONTINUES TO CAUSE PREVENTABLE LIVER DISEASE AND DEATHS WORLDWIDE.

Hepatitis C is a viral infection that affects the liver and is caused by the Hepatitis C virus (HCV). Unlike Hepatitis A, which spreads through contaminated food and water, Hepatitis C is transmitted through contact with infected blood. Although about 30% of infected people clear the virus naturally within six months, most develop chronic infection that can silently damage the liver over time, leading to cirrhosis, liver failure, or liver cancer.

According to the World Health Organization (WHO), an estimated 47 million people were living with chronic Hepatitis C in 2024, with 0.9 million new infections and 239,000 deaths, mostly due to cirrhosis and liver cancer. In India, the National Viral Hepatitis Control Programme provides free testing and treatment through public health facilities.

How does it spread?

Hepatitis C spreads when infected blood enters another person's bloodstream. Common routes include sharing needles or syringes, unsafe medical injections, poorly sterilised medical or dental equipment, transfusion of unscreened blood, and accidental needle-stick injuries among healthcare workers. Transmission from mother to baby during childbirth is uncommon, while sexual transmission is relatively rare but more likely among people living with HIV or those with multiple sexual partners. The virus does not spread through hugging, kissing, sharing food or water, coughing, sneezing, or breastfeeding.

Signs and symptoms

Hepatitis C is often called a "silent infection" because many people have no symptoms until significant liver damage has occurred. When symptoms appear, usually between two weeks and six months after infection, they may include fever, fatigue, nausea, loss of appetite, abdominal or joint pain, dark urine, pale stools, and jaundice (yellowing of the skin and eyes).

Diagnosis

Diagnosis begins with a blood test that detects antibodies to HCV, indicating previous exposure. A second test for HCV RNA confirms whether the infection is active. If confirmed, additional blood tests and imaging help assess liver damage and guide treatment. People at higher risk—including people who inject drugs, recipients of unscreened blood transfusions, healthcare workers with occupational exposure, and people living with HIV—should be tested regularly.

Treatment

Treatment has improved dramatically with direct-acting antiviral (DAA) medicines, which cure more than 95% of infections. Therapy typically lasts 12–24 weeks, depending on liver disease and the treatment regimen. Early diagnosis and treatment can prevent cirrhosis, liver failure, and liver cancer.

Prevention

There is no vaccine against Hepatitis C. Prevention relies on avoiding exposure to infected blood through safe injection practices, screening donated blood, proper sterilisation of medical and dental equipment, safe disposal of needles, and strict infection-control measures in healthcare settings. Access to sterile injecting equipment and harm-reduction services is essential for people who inject drugs. Using condoms can also reduce the risk of transmission where blood exposure is possible.

With widespread screening, timely treatment, and stronger prevention efforts, eliminating Hepatitis C as a public health threat is an achievable goal.

Source: <https://www.thehindu.com/sci-tech/health/all-you-need-to-know-about-hepatitis-c/article71169716.ece>
<https://www.thehindu.com/>



HEALTH

GLOBAL OVERUSE OF ANTIBIOTICS FUELS DRUG RESISTANCE, STUDY FINDS

A new study published in The Lancet Public Health reveals that almost all countries are overusing 'watch' antibiotics, a category of powerful drugs that should be reserved for serious infections when standard antibiotics fail. The findings raise concerns about the growing threat of antimicrobial resistance (AMR), one of the world's most pressing public health challenges.

The World Health Organization (WHO) classifies antibiotics into three groups under its AWaRe (Access, Watch, Reserve) framework. Access antibiotics, such as amoxicillin, are recommended as first-line treatments for common bacterial infections. Watch antibiotics are stronger medicines that should be used selectively because of their higher risk of promoting resistance. Reserve antibiotics are considered last-resort treatments for severe drug-resistant infections.

In 2024, the United Nations General Assembly endorsed the AWaRe system as the foundation for global antibiotic surveillance, setting a target that at least 70% of antibiotic use should come from the Access category by 2030. However, until now, there has been no practical method for determining appropriate antibiotic use at the national level.

To address this gap, researchers from the University of London and other institutions developed a framework that estimates the ideal antibiotic use for individual countries based on factors such as income levels, disease burden, and antibiotic resistance. Countries were grouped into four peer clusters with similar characteristics, allowing for more realistic national benchmarks.

The study estimated that around 43 billion antibiotic treatment courses were needed globally in 2019—approximately one course per person per year. Of these, about 77% should have been Access antibiotics, supporting the UN's 70% target.

When researchers compared these estimates with real-world data from 67 countries, they found widespread misuse. Nearly 72% of countries used more antibiotics overall than expected, while 99% exceeded the recommended use of Watch antibiotics. More than half of the countries also underused Reserve antibiotics, suggesting that some patients with life-threatening drug-resistant infections may not be receiving the medicines they need.

The study also found that 60% of countries continue to use antibiotics that the WHO no longer recommends, highlighting the urgent need to update prescribing practices. India, classified in Cluster Two, was estimated to require an optimal antibiotic consumption of 9.9–14.7 defined daily doses (DDD) per 1,000 inhabitants per day (DID). However, its actual use was 18.3 DID, with Watch antibiotics accounting for 9.3 DID, compared with only 4.5 DID from the Access category. This indicates a significant reliance on stronger antibiotics.

Researchers also highlighted global inequalities in antibiotic use. Low- and middle-income countries, which face higher rates of infectious diseases and drug resistance, require greater access to specialized Watch and Reserve antibiotics. Yet wealthier countries currently consume the largest share of these medicines.

The authors urge governments to strengthen antibiotic stewardship by reducing unnecessary prescriptions, phasing out outdated antibiotics, and ensuring patients with severe infections have timely access to appropriate treatments. They conclude that country-specific targets based on the new framework could help improve antibiotic use worldwide and slow the spread of antimicrobial resistance.

Source: <https://www.thehindu.com/sci-tech/health/almost-all-countries-overuse-antibiotics-contributing-to-drug-resistance-analysis/article71261314.ece>, <https://www.thehindu.com/>



OTHERS

Why do recessive traits from older generations suddenly reappear in one individual?



Genes usually occur in pairs, with one copy inherited from each parent. Some gene variants, known as dominant alleles, are expressed even when only one copy is present. Others, called recessive alleles, are expressed only when a person inherits two copies—one from each parent.

A person who carries one dominant allele and one recessive allele is known as a carrier. Carriers do not display the recessive trait because the dominant allele masks it. As a result, a recessive trait can remain hidden within a family for many generations, passed silently from parent to child without ever being expressed.

The trait can reappear when two carriers have a child together. If both parents pass on their recessive allele, the child inherits two recessive copies and the trait is expressed. This is why a characteristic that seemed to have disappeared from a family can suddenly re-emerge after several generations.

Chance also plays a crucial role. During the formation of eggs and sperm, genes are shuffled and distributed randomly, creating countless possible genetic combinations. This genetic reshuffling explains why even full siblings can inherit different traits from the same parents. It also determines whether a child of two carriers inherits two recessive alleles, one recessive allele, or none at all.

Source: <https://www.thehindu.com/sci-tech/science/why-do-recessive-traits-from-older-generations-suddenly-resurface-in-one-individual/article71113693.ece>, <https://www.thehindu.com/>



OTHERS

Why Don't Fruits or Other Plant-Based Foods Taste Naturally Salty?



The main reason plant-based foods are rarely salty, while animal products often have a more savory taste, lies in the different biological needs of plants and animals.

Animals require significant amounts of sodium to maintain extracellular fluids such as blood and lymph, transmit nerve impulses, and support muscle function. Because sodium has historically been scarce in many natural environments, animals evolved to actively seek it out, and their tissues naturally contain relatively high concentrations of salt.

Plants, on the other hand, have no nervous system or blood circulation. Instead of relying on sodium, they primarily use potassium to regulate water balance, maintain cell pressure (known as turgor pressure), and support growth. For most land plants, high concentrations of sodium are actually toxic, which is why salting the soil can kill vegetation.

There are a few exceptions. Certain salt-tolerant plants, known as halophytes, naturally accumulate sodium because they have adapted to thrive in coastal salt marshes and other saline environments. Examples include sea beans, sea grapes, and, to a lesser extent, celery, which can have a mildly salty flavor due to its mineral content.

Fruits are a different story. Their sweetness is an evolutionary strategy: plants produce sugary fruit to attract animals, which eat the fruit and later disperse the seeds—often with a convenient dose of natural fertilizer. A naturally salty fruit would be less appealing and could contribute to dehydration, making it a less effective reward for the animals that help spread the plant's seeds.

Source: <https://www.thehindu.com/sci-tech/science/why-do-we-not-have-any-fruits-or-plant-based-foods-that-naturally-taste-salty/article71272160.ece>, <https://www.thehindu.com/>