



## **INDIAN COUNCIL OF MEDICAL RESEARCH**

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February 22, 2019/Hindustan Times

### **Novel pill could replace injections to deliver insulin: Study**

February 9, 2019/Times of India

Researchers have developed a drug capsule that could be used to deliver oral doses of insulin, potentially replacing injections for patients with Type-2 diabetes, says a new study. About the size of a blueberry, the capsule contains a single and small needle made of compressed insulin, which is injected after the capsule reaches the stomach. The study showed that the capsule could deliver enough insulin to lower blood sugar to levels comparable to those produced by injections given through skin. They also demonstrated that the device can be adapted to deliver other protein drugs. "We are really hopeful that this new type of capsule could someday help diabetic patients and perhaps anyone who requires therapies that can now only be given by injection or infusion," said Robert Langer, Professor at the Koch Institute for Integrative Cancer Research in Britain. The tip of the needle is made of nearly 100 per cent compressed, freeze-dried insulin. The stomach wall has no pain receptors, so the patients would not be able to feel the prick of the injection. To ensure that the drug is injected into the stomach wall, the researchers designed their system so that no matter how the capsule lands in the stomach, it can orient itself so the needle is in contact with the lining of the stomach. The findings, published in the journal *Science*, showed that the researchers could successfully deliver up to 300 micrograms of insulin. More recently, they have been able to increase the dose to 5 milligrams, which is comparable to the amount that a patient with Type-2 diabetes would need to inject. Furthermore, no adverse effects from the capsule was found, which is made from biodegradable polymer and stainless steel components.

### **Novel approach brings hope in targeting cancer cells: Study**

February 9, 2019/Times of India

Researchers could provide a novel approach to targeting and destroying difficult-to-treat cancer cells, providing new therapeutic options for a broad range of cancers, finds a new study. Early detection of cancer is crucial for successful therapy. However, some cancer types do not have specific cancer surface markers that can be used to detect them and even the same cancer type can exhibit different properties in different patients. The latest finding, which was discovered while studying activated platelets in the setting of heart disease, may now prove useful for delivering targeted treatment to cancer cells without major side effects. Platelets are small blood cells that promote blood clotting and prevent us from bleeding when we are injured. Platelets and more specifically, "activated platelets", accumulate in the area surrounding a wide range of tumour types. Based on this observation, a team at the Baker Heart and Diabetes Institute in Australia has now developed a new imaging and platelet-targeting chemotherapy agent for the early detection and treatment of cancers. In addition, this approach provides the means to deliver high concentrations of chemotherapy specifically to tumour cells whilst minimising side effects and preventing tumour growth, said the study published in the journal *Theranostics*. "We have shown that we can image 'activated platelets' to detect tumours with clinically available imaging technologies such as ultrasound and PET/CT," said Karlheinz Peter, Professor at the varsity.

## **New 'Trojan horse' drug kills cancer from inside**

February 9, 2019/The Indian Express



A novel cancer drug which acts as a 'Trojan horse' to destroy tumours from the inside has shown promising results across six different forms of the deadly disease, scientists say. In patients with advanced, drug-resistant cancers, over a quarter with cervical and bladder tumours, and nearly 15 per cent with ovarian and lung tumours, responded to the new treatment, said researchers from the Institute of Cancer Research in the UK. The innovative new drug, called tisotumab vedotin (TV), releases a toxic substance to kill cancer cells from within. The results, published in *The Lancet Oncology*, are so positive the drug has now moved forward to phase II trials in cervical cancer and will be tested in a range of additional solid tumour cancers. The researchers led a global clinical trial of nearly 150 patients with a variety of cancer types who had stopped responding to standard treatments. They found that a significant minority of cancer patients responded to the drug, with their tumours either shrinking or stopping growing. The researchers saw responses in 27 per cent of patients with bladder cancer, 26.5 per cent with cervical cancer, 14 per cent ovarian cancer, 13 per cent with oesophageal, 13 per cent with non-small cell lung and seven per cent with endometrial cancer.

"What is so exciting about this treatment is that its mechanism of action is completely novel — it acts like a Trojan horse to sneak into cancer cells and kill them from the inside," said Professor Johann de Bono, a professor at the Institute of Cancer Research. "Our early study shows that it has the potential to treat a large number of different types of cancer, and particularly some of those with very poor survival rates," de Bono said. "TV has manageable side effects, and we saw some good responses in the patients in our trial, all of whom had late-stage cancer that had been heavily pre-treated with other drugs and who had run out of other options," he said. The researchers have already begun additional trials of the drug in different tumour types and as a second-line treatment for cervical cancer, where response rates were particularly high. They are also developing a test to pick out the patients most likely to respond.

## **Eradicating TB by 2025 in India a tough task: The Global Fund**

February 9, 2019/Times of India

While the government's goal of ending tuberculosis (TB) by 2025 in India is worthy of applause, it is "tough" and "very stretching", given where the country stands currently, says a top executive at the Switzerland-based non-profit The Global Fund. India currently has the world's highest burden of TB, with 27 per cent of all global cases and over 30 per cent of all deaths worldwide. In March 2017, Prime Minister Narendra Modi announced India's target for complete elimination of TB by 2025, five years ahead of global target of 2030. Elimination of TB will mean there should be less than one case of TB for a population of 10 lakh by 2025, according to the World Health Organisation (WHO). "The biggest challenge in fighting infectious disease in India is TB," Peter Sands, Executive Director of the Global Fund to Fight AIDS, Tuberculosis and Malaria, told IANS on Thursday. "2025 is a tough challenge, given where India stands and is very stretching, as it isn't far away," Sands added. However, he noted that it is great to have a demanding an ambitious goal and "since the announcement, there has been a marked acceleration in the progress against TB". "I would applaud the leadership and action being taken. The government is showing a will and determination to realise the ambitions goal," Sand stressed.

## **Vaccines saves lives, ignorance jeopardises them**

February 10, 2019/Hindustan Times



Rumours, falsehoods and blatant fabrications about the side effects of vaccination spread faster than the common cold, leading to misplaced fears and refusal to get vaccinated, which is among the most cost-effective ways of preventing disease and death. Vaccination prevents 2-3 million deaths worldwide each year, and an additional 1.5 million lives would be saved if everyone got vaccinated, according to the World Health Organization (WHO). Vaccinating at least 95% of the population builds community immunity and protects even those who have missed vaccination and remain susceptible to infection. Mass vaccination led to the global eradication of smallpox in 1979, with the last case reported in Somalia in 1977. Caused by the variola virus, smallpox was a devastating disease that infected at least 50 million people a year globally in the 1950s and killed an estimated 300 million in 20th century, compared to the 100 million people who died in wars and armed conflict during the same period. India was declared free of smallpox two years after the last indigenous case was reported in the Katihar district of Bihar on July 5, 1975. Mass vaccination campaigns made eradication possible within a year of smallpox devastating Bihar, Odisha and West Bengal in 1974, when India recorded at least 61,000 cases and 15,000 deaths. The global polio eradication efforts best exemplify vaccination's hits and misses. India got polio cases down from 741 in 2009 – the highest in the world -- to one within a year, with the last case was confirmed in West Bengal on January 13, 2011. Gaps in vaccination has led to polio persisting in neighbouring Pakistan and Afghanistan, which together had 50 cases last year and have reported one case each in January, 2019. HPV vaccination ran into controversy in India during the national and state governments' community "demonstration project" to vaccinate 10-14 year old girls in Khammam district in Andhra Pradesh and Vadodara district in Gujarat, with the project being stopped in 2010 after rumours linked vaccination to deaths of girls.

## **Smoking, alcohol consumption during pregnancy may lead to congenital deformities of face**

February 10, 2019/Hindustan Times

Smoking, alcohol consumption, exposure to chulha smoke or passive smoking, over-medication and radiation exposure during first few weeks of pregnancy along with nutritional deficiencies may lead to congenital deformities of the face such as cleft lip and palate anomaly, according to a study by AIIMS. Cleft lip or cleft palate is a condition when the two sides of the lip, developing in an unborn baby, do not completely fuse together. It affects weight speech and chewing habit of a child and leads to abnormal arrangement of teeth, poor jaw relations and facial aesthetic.

Cleft lip and palate anomaly constitute nearly one-third of all congenital malformations of the craniofacial region with an average worldwide incidence of 1 in 700. Its incidence in Asian population is reported to be around 1.7 per 1,000 live births or higher.

In India, even though a national epidemiological data is not available, many studies from different parts of the country have reported a variation in the incidence of cleft anomaly. Based on rough estimates, it is suggested that approximately 35,000 new-born cleft patients are added every year to the Indian population. The study, initiated by Centre for Dental Education and Research (CDER) at All India Institute of Medical Sciences since 2010, was conducted in three phases: pre-pilot, pilot and multi-centric. The pre-pilot phase was conducted

between 2010 and 2012. It aimed at developing comprehensive protocols for recording the history, investigations on dental anomalies, hearing defects and evaluation of speech-related problems in patients with cleft palate.

### As new cases rise, leprosy in spotlight

February 10, 2019/The Hindu

The rise in the number of recorded leprosy cases from 86,147 (in 2013-14) to 90,709 (2017-18), reported a decade and a half after India was declared leprosy-free in 2005, has turned the spotlight on the hotspots for the disease.

The World Health Organisation (WHO) has set the goal of zero children with leprosy and deformities by 2020, and less than one patient per million for other newly diagnosed patients. Today, though, Bihar, Chhattisgarh, Odisha, Jharkhand, Uttar Pradesh, West Bengal and Maharashtra remain the 'hotspots' from which maximum prevalence was detected last year. High population density, poor sanitation and inadequate access to nutrition are among the reasons for the number remaining high. The Centre says a more aggressive detection campaign is being carried out, explaining the numbers. The Leprosy Case Detection Campaign has shown that 34,730 cases were detected in 2016, 32,147 in 2017, and 16,097 in 2018. "We welcome the rise. It means we are catching these cases and putting the patients on treatment. But what the department is looking at is the new cases detected, the existing cases with leprosy-related handicap, and new cases in children. They are our actual ground check. The three parameters have shown a downward trend," said Anil Kumar, Deputy Director-General (Leprosy), Union Health Ministry.

## Infection trail

States that recorded maximum leprosy cases in three years

Year	2016	2017	2018*
Uttar Pradesh	14,282	13,456	12,583
Bihar	9,142	13,031	14,338
Maharashtra	10,103	9,887	9,836
West Bengal	7,211	8,578	9,175
Chhattisgarh	6,738	7,266	6,499
Odisha	6,044	5,383	6,325
Jharkhand	2,533	3,414	3,979



\*Cases on record as on March 2018 Source: National Leprosy Eradication Programme

Disease management efforts now include going down to the village level in what is called the “active seeking mode” for cases, where health workers go from house to house and physically examine people for a leprosy patch. “We were earlier missing many cases because people weren’t reporting due to fear, social stigma and lack of awareness,” said Dr. Kumar.

Leprosy is a chronic disease caused by a bacillus, *Mycobacterium leprae*, which multiplies slowly. The incubation period of the disease, on average, is five years. In some cases, symptoms may occur within one year but can also take as long as 20 years to occur. “This is exactly the trouble with the elimination of leprosy. The long incubation period, and the social stigma attached to it, makes it a tough disease to eliminate,” said Dr. Kumar.

### **This novel method can predict fatal heart disease**

February 11, 2019/Hindustan Times

A novel method called stress cardiac MRI can not only diagnose heart disease, but can also predict which cases are potentially fatal, suggests a new research. The study showed that predicting mortality is a key requirement for the technology to be more widely used. In addition, results suggest cardiac magnetic resonance (CMR) has the potential to be a non-invasive, non-toxic alternative to stress echocardiograms, catheterisations and stress nuclear exams in identifying the severity of the coronary artery disease. “We’ve known for some time that CMR is effective at diagnosing coronary artery disease, but it’s still not commonly used and represents less than one per cent of stress tests used in this country,” said senior author Robert Judd, co-director of the Duke Cardiovascular Magnetic Resonance Center in the US. For the study, researchers analysed data from more than 9,000 patients who underwent CMR. The findings, published in *JAMA Cardiology*, showed that for patients without any history of heart disease and at low-risk based on traditional clinical criteria, those with an abnormal CMR scan were 3.4 times more likely to die compared to patients with a normal CMR scan. For the entire patient population, there was a strong association between an abnormal stress CMR and mortality, even after adjusting for patient age, sex and cardiac risk factors, the team found. While non-invasive cardiac stress testing is a cornerstone in the clinical management of patients with known or suspected coronary artery disease, CMR works as well or better than other exams at identifying heart wall motion, cell death and the presence of low blood flow, said the study.

Heated tobacco devices equally harmful as e-cigarettes, smoking: Study

### **Here's how fungus can impair the immune system**

February 12, 2019/The Times of India

While healthy people usually have no problem if microorganisms find their way into their bodies as their immune defence system will put the spores out of action, a specific type of fungus can threaten lives with a compromised immune system, such as AIDS patients or who are immunosuppressed following organ transplantation, says a new study. Researchers have now discovered how the fungus -- *Aspergillus fumigatus* -- knocks out the immune defences, enabling a potentially fatal fungal infection to develop. Among other factors, it is gliotoxin -- a potent mycotoxin -- that is responsible for the pathogenicity of *Aspergillus fumigatus*. Pathogenicity refers to the ability of an organism to cause disease.

"It was known that this substance has an immunosuppressive effect, which means that it weakens the activity of cells of the immune defence system. However, it had not been clear previously how exactly this happens," said Oliver Werz, Professor at the University of Jena in Germany.



### **Here's how exercise may protect against Alzheimer's**

February 12, 2019/The Times of India

A new study finds that exercise produces a hormone that may improve memory and protect against Alzheimer's disease. The study was co-led by Ottavio Arancio, a researcher at Columbia University's Vagelos College of Physicians and Surgeons and Taub Institute for Research on Alzheimer's Disease and the Aging Brain. An earlier study a few years back discovered a hormone called irisin that is released into the circulation during physical activity. And research found that the hormone may also promote neuronal growth in the brain's hippocampus. Speaking about it, Arancio said, "This raised the possibility that irisin may help explain why physical activity improves memory and play a protective role in brain disorders such as Alzheimer's disease."

Arancio and his colleagues looked for a link between irisin and Alzheimer's. Using tissue samples from brain banks, they found that irisin is present in the human hippocampus and that hippocampal levels of the hormone are reduced in individuals with Alzheimer's.

These experiments show that irisin, in mice, protects the brain's synapses and the animals' memory: When irisin was disabled in the hippocampus of healthy mice, synapses and memory weakened. Similarly, boosting brain levels of irisin improved both measures of brain health. The researchers then looked at the effect of exercise on irisin and the brain. In the study's most compelling experiments, the researchers found that mice that swam nearly every day for five weeks did not develop memory impairment despite getting infusions of beta amyloid - the neuron-clogging, memoryrobbing protein implicated in Alzheimer's.

### **How geneticist Helen Hobbs found a way to fight bad cholesterol**

February 12, 2019/The Hindu

The discovery of cholesterol-lowering mutations in a human gene called PCSK9 led to the development of the most promising new drugs against heart disease since statins. At the Hyderabad edition of the TNQ's Distinguished Lectures in Life Sciences, geneticist Helen Hobbs told an audience of scientists and lay persons the story of this discovery. Hobbs and her colleague at Dallas' UT Southwestern Medical Center, geneticist Jonathan Cohen, found that when people had a mutation in PCSK9, they ended up with lower levels of low-density lipoprotein (LDL) or bad cholesterol. Through this mechanism, the mutation protected people against heart disease, seemingly without side effects. In 2016, Hobbs was awarded the Breakthrough Prize in Life Sciences for her work. Hobbs' research journey was unusual in many ways. When she began working on cholesterol in the early 2000s, the prevailing strategy among researchers looking for the genetic basis of disease was to search for common gene variants (present in around 5% of the population). However, this strategy hasn't gone very far in understanding complex illnesses like heart disease; most common variants only have small effects on traits like cholesterol. Hobbs reasoned that it would be more fruitful to look for rare gene variants with large impacts. Large impacts would also mean such findings would translate more quickly into treatments, she said.

## **Western diet may up severe sepsis risk: Study**

February 12, 2019/The Indian Express



A Western diet high in fat and sugar can put a person at increased risk of developing severe sepsis — one of the most common causes of death worldwide — a study has found. The research, published in the journal Proceedings of the National Academy of Sciences, takes a closer look at how the Western diet affects the severity and outcome of sepsis. Sepsis, the body's reaction to fighting an infection, can lead to shock and organ failure, researchers said. It is the 11th most common cause of death worldwide. Researchers from Portland State University (PSU) in the US fed mice Western diet — characterised as being low in fibre and high in fat and sugar. The mice showed an increase in chronic inflammation, sepsis severity and higher mortality rates than mice that were fed a normal diet. The findings suggest the mice had more severe sepsis and were dying faster because of something in their diet, not because of the weight gain or microbiome, the body's community of bacteria, said Brooke Napier, an assistant professor at PSU. "The mice's immune system on the Western diet looked and functioned differently," Napier said. "It looks like the diet is manipulating immune cell function so that you're more susceptible to sepsis, and then when you get sepsis, you die quicker," she said. The findings can help hospitals better monitor the diets of patients in the intensive care unit since they're already the ones most likely to develop sepsis, researchers said.

## **Regularly consuming 'ultra-processed' foods increases risk of early death**

February 13, 2019/Hindustan Times

While we all love nibbling away at our pizzas, chips or French fries, a new study, conducted in France, now finds that we face a 14% higher risk of early death with each 10% increase in the amount of ultra-processed food we eat.

The authors of the study wrote in the journal JAMA Internal medicine that ultra-processed foods are manufactured industrially from multiple ingredients that usually include additives used for technological and/or cosmetic purposes, reported CNN. They added, "Ultra-processed foods are mostly consumed in the form of snacks, desserts, or ready-to-eat or -heat meals," and their consumption "has largely increased during the past several decades."

This trend may drive an increase of early deaths due to chronic illnesses, including cancer and cardiovascular disease, they say. According to the study, in the United States alone 61% of an adult's total diet comes from ultra-processed foods. In Canada, the figure is around 62% while in the UK, that proportion is 63%.

To understand the relationship between ultra-processed foods and the risk of an earlier-than-expected death, the researchers enlisted the help of 44,551 French adults for two years. Ultra-processed food consumption was associated with younger age, lower income, lower educational level, living alone, higher BMI and lower physical activity level. Over the study period, 602 participants died. After adjusting for factors such as smoking, the researchers calculated an associated 14% higher risk of early death for each 10% increase in the proportion of ultra-processed foods consumed. The authors speculate that the additives, the packaging (chemicals leech into the food during storage) and the processing itself, including high-temperature processing, may be the factors that negatively affect health.

## **Novel blood test can measure severity of pain**

February 14, 2019/Hindustan Times



A first-of-its kind blood test that can measure the severity of pain in patients may help curb unnecessary prescriptions of painkillers, which are often addictive. For the study published in the journal *Molecular Psychiatry*, researchers tracked hundreds of participants to identify biomarkers in the blood that can help objectively determine how severe a patient's pain is. The blood test would allow physicians far more accuracy in treating pain-as well as a better long-term look at the patient's medical future. "We have developed a prototype for a blood test that can objectively tell doctors if the patient is in pain, and how severe that pain is," said Alexander Niculescu, a professor at Indiana University in the US.

"It's very important to have an objective measure of pain, as pain is a subjective sensation. Until now we have had to rely on patients self-reporting or the clinical impression the doctor has," said Niculescu. "When we started this work it was a farfetched idea. In addition to providing an objective measure of pain, the blood test helps physicians match the biomarkers in the patient's blood with potential treatment options. Researchers utilise a prescription database - similar to fingerprint databases employed by the FBI - to match the pain biomarkers with profiles of drugs and natural compounds cataloged in the database. "The biomarker is like a fingerprint, and we match it against this database and see which compound would normalise the signature," said Niculescu. "We found some compounds that have been used for decades to treat other things pair the best with the biomarkers. We have been able to match biomarkers with existing medications, or natural compounds, which would reduce or eliminate the need to use the opioids," he added.

## **Immune stimulant molecule shown to prevent cancer: Study**

February 15, 2019/The Tribune

Scientists say they have identified a molecule that stimulates the immune system and may protect against the development of multiple types of cancer.

The recombinant protein molecule SA-4-1BBL has been used to enhance the therapeutic efficacy of cancer vaccines with success in pre-clinical animal models, said researchers from the University of Louisville in the US.

It accomplishes this by boosting the effectiveness of CD8+ T cells, adaptive immune cells trained to target the tumour for destruction, according to the study published in the journal *Cancer Research*. When the researchers treated normal healthy mice with SA-4-1BBL alone, the mice were protected when they later exposed them to different types of tumour cells. "The novelty we are reporting is the ability of this molecule to generate an immune response that patrols the body for the presence of rare tumour cells and to eliminate cancer before it takes hold in the body," said Haval Shirwan, a professor at the University of Louisville.

Additional testing showed that CD8+ T cells were not required for the protection, but when CD4+ T and NK cells were eliminated in the mice, protection failed, indicating these two cell types were necessary to achieve the effect.

The lack of necessity for CD8+ T cells indicates the process is not one of conventional acquired immunity. Although the research tested the mice for cervical and lung cancers, the protective function of SA-4-1BBL works without context of specific tumour antigens, giving it the potential to be effective in preventing any number of tumour types. "We are very excited about the cancer

immunoprevention possibilities of this molecule. Its effectiveness is not tumour specific, and as a natural ligand, it does not cause toxicity, as is found with 4-1BB agonist antibodies.



### **Push-ups can keep heart disease risk at bay: Study**

February 16, 2019/The Tribune

Active, middle-aged men who can complete more than 40 push-ups at a time had a significantly lower risk of cardiovascular disease (CVD) outcomes compared to those who did less than 10 push-ups, says a new study. The study, published in JAMA Network Open, showed that men who are able to do more than 40 push-ups had a 96 per cent reduced risk of CVD events compared with those who were able to do less than 10 push-ups. In addition, push-up capacity was more strongly associated with lower incidence of cardiovascular disease events than was aerobic capacity as estimated by a submaximal treadmill exercise test. For the study, the researchers from Harvard University analysed health data from 1,104 active male firefighters whose mean age was 39.6. During the 10-year study period, 37 CVD-related outcomes were reported. "Our findings provide evidence that push-up capacity could be an easy, no-cost method to help assess cardiovascular disease risk in almost any setting," said lead author Justin Yang at the Harvard T.H. Chan School of Public Health in the US. The results are not generalisable to women, men of other ages or who are less active, the researchers noted.

### **Healthwise: Why outbreaks occur, and how to stop them**

February 17, 2019/Hindustan Times

Infections such as influenza, dengue, malaria and conjunctivitis, which caused seasonal outbreaks during the warm and humid monsoons in peninsular and northern parts of India till a decade ago, now sicken people through the year.

Why is this happening? Are extremes in weather changing virus behaviour and disease patterns or are they altering our immune response to infection? Or is rapid population growth, which has led to human settlements encroaching into forests and people increasingly living in urban and peri-urban clusters in close proximity to other humans and animals, fuelling the rapid spread of infection among people and, in rarer cases, resulting in viruses jumping from animal to human to create novel zoonoses? It's a combination of all these factors. Extreme temperature and unseasonal rain have expanded the geographical breeding grounds of vectors such as mosquitoes, leading to perennial infection of a few vector-borne diseases such as malaria and dengue. Now studies show it is also affecting a person's defence to viral infection. A high ambient temperature of 36 °C and above impairs the adaptive immune responses against infection viruses such as influenza viruses and zika, according to study in mice published in the journal, [10.1073/pnas.1815029116] Proceedings of the National Academy of Sciences USA. The study found that heat-exposure severely lowered the immune response virus-specific CD8 T-cells and antibody responses following respiratory influenza virus infection.

Zoonoses, or diseases transmitted to humans from other animals, are among the most dangerous viruses as they mutate and evade the host's immunity. Expanding human settlement in forested areas provides more opportunities for viruses to jump to people. More people are living in closer proximity to animals and risk getting infected with animal diseases. Influenza viruses infect wild fowl, pigs, cattle, poultry and humans, and with India's population growing at an annual rate of 1.1%, more people are living in close contact with each other and animals that have lost their natural habitat to human settlements.

Influenza virus subtypes are distinguished by their antigenic properties of two surface glycoproteins: haemagglutinin (H) and neuraminidase (N), which promote and coordinate host cell entry and exit, respectively. The US Centers for Disease Control and Prevention identifies 18 H subtypes and 11 N subtypes, for a theoretical total of 198 strain variations. Only H1, H2, and H3 are known to have human-to-human transmission, but the potential threat remains.

### **Measles cases nearly doubled in 2018: WHO**

February 18, 2019/Hindustan Times

A total of 229,068 cases of measles were reported in 2018, nearly double the number of infections contracted in the previous year, the WHO has said.

The World Health Organization (WHO) has appealed to the Member States to close gaps in vaccine coverage. The appeal follows its previous announcement that an estimated 110,000 people died from the highly infectious but easily preventable disease in 2017. "Measles is not going anywhere...It's everyone's responsibility. For one person infected, up to nine or 10 people could catch the virus," said Katherine O'Brien, Director of Immunization, Vaccines and Biologicals at the WHO.

In addition to being potentially fatal, measles symptoms include rashes, blindness and inflammation of the brain. The virus can be transmitted extremely easily, by coughing and sneezing, and it can also survive for hours in a droplet of water.

Measles knows no "geographical or political borders", O'Brien said, noting nonetheless that since the year 2000, deaths from measles have fallen by over 80% "probably saving around 21 million lives" in that period. In recent years, vaccine coverage has stalled at 85%. This is far short of the 95% needed to prevent outbreaks and leaves many people susceptible to the disease. Second-dose coverage stands at 67%. Countries should also identify and address all communities that are under-immunised, said Katrina Kretsinger, Medical Officer in the Expanded Programme on Immunization at WHO. "Some populations are more at risk than others. Children, migrants, refugees and poor populations," she said. Although the WHO is working in affected regions with ministries of health it won't commit to a compulsory vaccination recommendation. "It's up to the countries to implement vaccination programmes. Some have made it mandatory for children to be vaccinated in order to attend school," Kretsinger suggested. Before the introduction of the measles vaccine in 1963, the outbreaks and epidemics occurred every two to three years, causing an estimated 2.6 million deaths every year.

## **'Killer' immune cells may lead to universal flu vaccine**

February 19, 2019/The Tribune



Scientists have identified 'killer' immune cells that can fight all known strains of flu virus, a "game-changing result" that could lead to a universal, one-shot vaccine against the potentially deadly disease. These microscopic killers are white blood cells that can maintain a memory of previous exposure to a flu strain, said researchers from the University of Melbourne in Australia. If they recognise an invader, these cells start an immune response to target and kill off the virus—stopping the infection, they said. Despite hopes that the 'memories' of killer cells—formally known as CD8+T cells—could be used to create a vaccine that would last for life, previous studies have shown that these cells could only mount a repeated attack against strain A. In a study published in the journal Nature Immunology, scientists revealed game-changing results—the 'killer cells' can actually fight all influenza strains, A, B and C.

"Our team has been fascinated by the killer cells for a long time," said Katherine Kedzierska, a professor at the University of Melbourne.

Having established which sections of the virus were conserved or cross-reactive, the researchers then conducted tests to establish if those viral parts did produce a robust immune response. These flu virus epitopes were found in blood samples taken from healthy humans, and influenza-infected adults and children.

The research team next conducted vaccination tests on mice by using the peptides responsible for activating the killer cells as a form of vaccination.

"Our vaccination test studies revealed remarkably reduced levels of flu virus and inflammation in the airways in animal models," Koutsakos said.

"These results show that killer T cells provide unprecedented immunity across all flu viruses, a key component of a potential universal vaccine," Koutsakos said.

## **Small cell lung cancer may respond to combination therapy**

February 19, 2019/ET Worldworld

Researchers have now discovered that a combination of immune checkpoint blockade and targeted therapies that block normal DNA damage repair (DDR) achieved significant tumour regression in mouse models of small cell lung cancer (SCLC).

The University of Texas MD Anderson Cancer Center research suggests a promising new approach for treating patients with this aggressive cancer. The research, published in Cancer Discovery, suggest that the PARP inhibitor olaparib and other DDR inhibitors induce a rapid immune response and sensitise SCLC cells to immunotherapy, to which they were previously resistant. According to corresponding author of the study Lauren Averett Byers, small cell lung cancer, one of the most aggressive types of cancer, makes up about 15 per cent of all lung cancers diagnosed in the US alone. Standard treatment for advanced SCLC is chemotherapy, but recurrence is common and the average survival is only about 12 months, according to Byers. For about 30 years, there were no changes to this approach, but recently the use of immunotherapy in combination with chemotherapy has become a new standard. However, the benefits are minimal for patients. "I think the results from this study are really compelling because of the dramatic activity that we saw with the combination of adding a targeted therapy to immune therapy," said Byers, adding, "I think our findings can be rapidly translated into the clinic for our patients and also to other cancer types."

Byers and colleagues hope to launch clinical trials to investigate the combination approach later this year, and expect this may also be effective in other cancer types defined by increased DNA damage, such as BRCA-mutant breast and ovarian cancers. This study was supported by the Lung Cancer Moon Shot, part of MD Anderson's Moon Shots Program, a collaborative effort to accelerate the development of scientific discoveries into clinical advances that save patients' lives.

### **Vaccine could virtually eliminate cervical cancer**

February 20, 2019/Hindustan Times

The rapid scale-up of the human papillomavirus (HPV) vaccine could virtually eliminate cervical cancer in a handful of rich countries within three decades, and in most other nations by century's end, researchers said Wednesday.

Without screening and HPV vaccination, more than 44 million women will likely be diagnosed with the disease over the next 50 years, they reported in *The Lancet Oncology*, a medical journal. Two thirds of these cases - and an estimated 15 million deaths -- would occur in low- and medium-income countries. By contrast, the rapid deployment starting in 2020 of screening and vaccination could prevent more than 13 million cervical cancers by mid-century worldwide, and lower the number of cases to below four-per-100,000 women, the study found.

"This is a potential threshold for considering cervical cancer to be eliminated as a major public health problem," the authors said in a statement.

Earlier this month, the World Health Organization (WHO) reported 570,000 new cases worldwide in 2018, making it the fourth most common cancer for women after breast, colon and lung cancer. The disease claims the lives of more than 300,000 women every year, mostly in lower income nations. "Despite the enormity of the problem, our findings suggest that global elimination is within reach," said lead author Karen Canfell, a professor at the Cancer Council New South Wales, in Sydney.

Transmitted sexually, HPV is extremely common and includes more than 100 types of virus, at least 14 of them cancer-causing. The viruses have also been linked to cancers of the anus, vulva, vagina and penis. It takes 15 to 20 years for cervical cancer to develop in women with normal immune systems. If the immune system is weak or compromised -- by HIV infection, for example -- the cancer can develop far more quickly. Clinical trials have shown that HPV vaccines are safe and effective against the two HPV strains - types 16 and 18 - responsible for 70 percent of cervical cancer cases. The study's projections presume the vaccination of 80 percent of girls 12 to 15 years old starting in 2020, and that at least 70% of women undergo screening twice in their lifetime. This would push the prevalence of the disease below the bar of 4/100,000 women in countries such as the United States, Canada, Britain and France by 2059, and in mid-income countries such as Brazil and China by 2069, the authors calculate.

## **Garlic, onion lower colorectal cancer risk: Study**

February 22, 2019/Hindustan Times



Consumption of allium vegetables including garlic, onion and leek, is associated with a reduced risk of colorectal cancer, researchers say.

Colorectal cancer is the cancer of the colon or rectum, located at the digestive tract's lower end. The study, published in the Asia Pacific Journal of Clinical Oncology, showed that the odds of having colorectal cancer was 79 per cent lower in adults who consumed high amounts of allium vegetable compared with those who consumed them in low amounts. "It is worth noting that in our research, there seems to be a trend: the greater the amount of allium vegetables, the better the protection," said researcher Zhi Li from the First Hospital of China Medical University. "In general, the present findings shed light on the primary prevention of colorectal cancer through lifestyle intervention, which deserves further in-depth explorations."

For the study, 833 patients of colorectal cancer were matched to 833 healthy controls by age, sex and residence area. Importantly, according to World Health Organization, colorectal cancer is one of the most common cancers around the world along with male preponderance with 1.80 million cases and 862,000 deaths in 2018.

## **Pact to find solutions to asthma, other diseases inked**

February 22, 2019/The Indian Express

A PACT was inked on Thursday between city-based Chest Research Foundation (CRF) with India subsidiary of global innovation company, 3M India, to collaborate on a research study that will generate data for providing solutions to reduce increasing cases of asthma, chronic obstructive pulmonary diseases (COPD) and occupational lung diseases. Based on academic research and industrial expertise, the study will focus on raising awareness among more than 3,500 pulmonologists in India about management, prevention and long-term impact of chronic and occupational lung diseases.

Globally, respiratory diseases are the third leading cause of death worldwide, and India bears 32 per cent of the global burden of respiratory diseases. An alarming number of cases are reported every year about chronic respiratory diseases and high pollution levels across cities in India. Studies have indicated that the number of COPD and asthma cases were 1.7 and 2.4 times higher in India than the global average in 2016.

"Owing to a lack of data, infrastructure and skills at the primary and secondary healthcare levels, a majority of the asthma and COPD cases remain undiagnosed, and hence it is of utmost importance to educate the medical fraternity and citizens to enhance early and accurate diagnosis, and proper treatment," said Dr Sundeep Salvi, director, Chest Research Foundation.

Salvi added, "The number of patients suffering from COPD and asthma in India is alarming. Along with the deteriorating air quality in our cities, this number is increasing yearly." Debarati Sen, managing director, 3M India Region (India and Sri Lanka), said their interest in the subject stemmed from 30 years of experience in working with industrial labour in India. Sen added that they recognised a compelling need to raise awareness on using the right apparatus. "Globally, 3M has conducted studies and research in the areas of air pollution, ill effects of exposure and on ways to protect against exposure to pollutants, making this collaboration symbiotic," Sen added.

## Researchers find new, more accurate way to diagnose the cause of back pain



February 22, 2019/Hindustan Times

It is common for most doctors to advise imaging tests like MRI or X-ray to determine the cause of back pain. These are useful if the problem is due to a structural issue in the spine. But, most back pain cases are mechanical in nature. In such cases, imaging tests like MRI & X-rays fail to show the complete picture. MRI and X-ray images cannot distinguish between subtypes of back pain and chronic issues. MRI findings do not match with intensity of pain and disability in case of discogenic back pain. Interpretive errors by radiologists make these reports extremely subjective which, can directly impact the diagnosis, treatment and clinical outcomes. These are only a few of the many shortcomings of referring to imaging tests as the primary mode of diagnosis. The good news is that researchers from Germany have made advances in developing very accurate spine function tests which are now being used extensively by leading physicians and orthopaedics. “New technological advances in back pain diagnosis has helped us jointly build a path to non-surgical treatment of back and neck pain. This can help us approach the problem with a more holistic view. This is certainly changing the face of back pain treatment in India,” shared Dr Gautam Shetty, a senior orthopaedic surgeon from Mumbai. “The most common form of back pain comes from mechanical wear and tear of the support tissues of the spine. A spine function test can individualise your problem and help develop a need-based rehabilitation programme. This seems to be the future of back pain cure,” concluded Dr Abhay Nene, an eminent spine surgeon. Notably, a spine function test can reveal weaknesses in the patient’s spine and isolate the affected area and the movements, which cause the pain. This enables doctors to focus on the affected area with targeted treatment. The Digital Spine Analysis (DSA) is a gold standard in spine function testing and is accepted by doctors worldwide. It is more accurate because it performs a functional analysis of the spine. The mechanical structure of the back is monitored on different motion sensitive devices across parameters like - strength, mobility, and balance, to identify the muscle groups which are causing pain. This helps the spine specialists prescribe a tailor-made spine rehabilitation programme can even prevent surgery in some cases.

With regards,

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