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Editorial

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Mini Review section – HFMD was first described in a summer outbreak that occurred in Toronto, Canada in 1957. The causative virus is usually Coxsackievirus A16 from the genus Enterovirus, family Picornaviridae. Enterovirus 71 along with other coxsackievirus types. Hand, foot, and mouth disease (HFMD) is a common infection in children that causes sores called ulcers inside or around their mouth and a rash or blisters on their hands, feet, legs, or buttocks. It can be painful, but it isn't serious.

Current Trends section – Spirulina belongs to the cyanobacteria class of single-celled microorganisms, also known as blue-green algae. It is found in both salt and fresh water and packed with all sorts of antioxidants, nutrients, minerals, and vitamins beneficial to both your body and brain. This alga is one of the best-known, eco-friendly dietary supplements in the world. Spirulina is a great source of essential vitamins and minerals needed for your child's proper development and growth.

In Profile Scientist – Swaminathan was educated at a local high school and later at the Catholic Little Flower High School in Kumbakonam, from which he matriculated at age 15. Right from childhood, he had interaction with farming and farmers; his extended family grew rice, mangoes and coconut, later expanding into areas such as coffee. He saw the impact fluctuations in the price of crops had on his family, including the devastation that weather and pest could cause to crops as well as incomes.

Bug of the Month – The infection, known as Zika fever or *Zika virus* disease, often causes no or only mild symptoms, similar to a very mild form of dengue fever. While there is no specific treatment, paracetamol (acetaminophen) and rest may help with the symptoms. As of April 2019, no vaccines have been approved for clinical use, however several vaccines are currently in clinical trials. Zika can spread from a pregnant person to their baby. This can result in microcephaly, severe brain malformations, and other birth defects. Zika infections in adults may result rarely in Guillain–Barré syndrome.

Did You Know? – In a study recently published in The BMJ, researchers found that men who consumed high rates of ultra-processed foods were at 29% higher risk for developing colorectal cancer—the third most diagnosed cancer in the United States—than men who consumed much smaller amounts. They did not find the same association in women.

Best Practices –.For most people, the concept of hygiene conjures up images of brushing your teeth, applying deodorant or taking a shower: simple, daily practices to keep your body clean and healthy. But mental health providers say your mind can also benefit from a quick morning tune-up. Spending 15 minutes on mental health hygiene each day can bring a host of benefits, from improved mood and better relationships to even deeper concentration and enhanced creativity.

Tickle yourself enjoying the jokes in our **Relax Mood section**.

Our JHS team is thankful to all our readers for their ever-increasing appreciation that has served as a reward & motivation for us. Looking forward for your continuous support.

Hand Foot and Mouth Disease

Hand, Foot, and Mouth Disease (HFMD) is a viral illness occurring mainly in infants and children characterized by an oral enanthem and a macular, maculopapular, or vesicular rash of the hands and feet (and possibly other locations).

HFMD was first described in a summer outbreak that occurred in Toronto, Canada in 1957. The causative virus is usually Coxsackievirus A16 from the genus Enterovirus, family Picornaviridae. Enterovirus 71 along with other coxsackievirus types A4-A7, A9, A10, B1-B3, and B5 are responsible for some sporadic cases. Large, severe outbreaks affecting thousands of people occur frequently in some countries in Asia. Hand, foot, and mouth disease (HFMD) is a common infection in children that causes sores called ulcers inside or around their mouth and a rash or blisters on their hands, feet, legs, or buttocks. It can be painful, but it isn't serious.

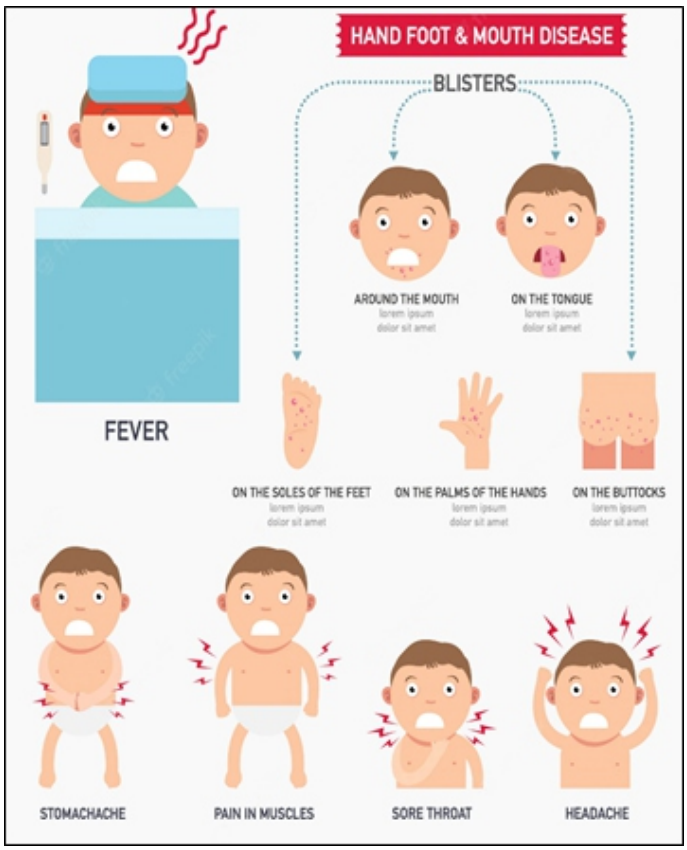
It's not the same thing as foot-and-mouth disease, which comes from a different virus and affects only animals.

Signs and symptoms

Small, oval, white blisters on the palms, soles of the feet, as well as in the mouth. Your child may have a sore mouth and throat, leading to poor appetite or risk of dehydration (drinking and eating can be painful because of the mouth blisters).

A red skin rash with a brown scale on it. The rash appears on the outer arms, hands, legs, feet, around the mouth and upper buttocks. The trunk is usually relatively clear. Sometimes there are blisters present, but they are not usually in the mouth and your child can eat and drink as usual.

The blisters should not be itchy like chickenpox blisters. If your child has eczema, the HFMD can cause the eczema to worsen and potentially become infected with bacteria.



The most common symptoms of hand, foot and mouth disease are:

- fever
- tiny blisters in and around the mouth and on the hands and feet, and sometimes in the nappy area in infants, or a red skin rash with a brown scale on the outer arms, hands, legs, feet, around the mouth and upper buttocks
- sore throat and mouth, which may make eating or drinking difficult
- runny nose
- cough
- loss of appetite
- tiredness

The symptoms of hand, foot and mouth disease usually start to appear 3 to 7 days after a person is infected, and typically last for 7 to 10 days.

Causes & Transmission

Hand, foot, and mouth disease is caused by viruses. A person infected with one of these viruses is contagious, which means that they can pass the virus to other people.

The virus can spread to others through an infected person's

- Nose and throat secretions, such as saliva, drool, or nasal mucus
- Fluid from blisters or scabs
- Feces

People are most contagious during the first week that they are sick.

You can get hand, foot, and mouth disease by

- **Contact with respiratory droplets containing virus particles** after a sick person coughs or sneezes
- **Touching an infected person** or making other close contact, like kissing, hugging, or sharing cups or eating utensils
- **Touching an infected person's feces**, such as changing diapers, then touching your eyes, nose, or mouth
- **Touching objects and surfaces** that have the virus on them, like doorknobs or toys, then touching your eyes, nose, or mouth

Viruses that cause hand, foot, and mouth disease

Hand, foot, and mouth disease is caused by viruses that belong to the Enterovirus family.

Common causes of hand, foot, and mouth disease are:

- **Coxsackievirus A16** is typically the most common cause of hand, foot, and mouth disease
- **Coxsackievirus A6** can also cause HFMD and the symptoms may be more severe.
- **Enterovirus 71 (EV-A71)** has been associated with cases and outbreaks in East and Southeast Asia.

Prevention

Wash your hands

Wash your hands often with soap and water for at least 20 seconds. If soap and water are not available, use an alcohol-based hand sanitizer.

Always wash your hands:

- After changing diapers
- After using the toilet
- After blowing your nose, coughing, or sneezing
- Before and after caring for someone who is sick

Clean and disinfect frequently touched surfaces and shared items, including toys and doorknobs.

Avoid touching your eyes, nose, and mouth: You can get infected with hand, foot, and mouth disease if you have the virus on your hands and then touch your eyes, nose, or mouth.

Avoid close contact with sick people : Avoid touching someone who has hand, foot, and mouth disease, such as hugging or kissing them.

Treatment

There's no cure or vaccine for hand, foot, and mouth disease. Because a virus causes it, antibiotics won't help. It usually goes away on its own after 7 to 10 days. In the meantime, you can help your child feel better with:

- Cold treats like ice pops, yogurt, or smoothies to soothe a sore throat. Avoid juice and soda, which have acids that might irritate sores.
- Anti-itch lotion, like calamine for rashes.

Spirulina for children's nutrition

Health and nutrition are the critical for the growth and human development. Since birth, better nutrition is of utmost importance for a child to have a robust immune system. It is essential to lower the chances of acquiring communicable and non-communicable diseases.

Spirulina belongs to the cyanobacteria class of single-celled microorganisms, also known as blue-green algae. It is found in both salt and fresh water and packed with all sorts of antioxidants, nutrients, minerals, and vitamins beneficial to both your body and brain. This algae is one of the best-known, eco-friendly dietary supplements in the world.

Spirulina is a great source of essential vitamins and minerals needed for your child's proper development and growth.

Vitamins in spirullina

- Vitamin C otherwise known as ascorbic acid, is a very important part of any diet. Not only does it help to improve the condition of one's skin, but it also helps to strengthen the immune system, preventing your child from catching the flu and other viruses common among children.

- Vitamin A. Also known as beta carotene, this vitamin improves your child's eyesight, allowing them to see better even in dim light. Plus, this antioxidant helps to prevent the appearance of Bitot's spot and the occurrence of Corneal xerosis, which is a severe form of vitamin A deficiency.
- Vitamin E. This antioxidant is also essential for improving skin condition and protecting cell membranes, shielding them from outside elements.

Minerals in spirulina

- Calcium is a key to strong and healthy teeth, bones, and muscles. It can also protect the body from osteoporosis and severe fractures. The recommended daily dose of calcium for children aged from 1 to 3 is 700 mg, while kids from 4 to 8 should consume at least 1,000 mg of calcium a day. When it comes to older kids aged from 9 to 18, the perfect daily dose is 1,300 mg, which equals about 4 cups of milk.
- Potassium: this spirulina component is responsible for keeping the blood pressure in check. It is responsible for the production of enzymes and new cells, and it can also boost your child's ability to heal wounds.
- Iron. It enhances muscle strength, transports oxygen throughout the body, and keeps the blood cells healthy.
- Magnesium. This mineral takes part in a plethora of vital functions our body performs, like turning the food we consume into energy. It also ensures that our bones stay healthy, preventing osteoporosis and lowering blood pressure, just like iron.
- Zinc. This mineral is responsible for the creation of new enzymes and cells, thus promoting wound healing.

Spirulina Programme of the Sundargarh administration has helped to enhance child nutrition. This programme is being implemented in the entire district with the help of 3,809 Anganwadi centres by providing spirulina fortified sugar to children between 7 months to 2 years and spirulina fortified chikkis to children from 2 to 6 years, covering about one and a half lakh children.

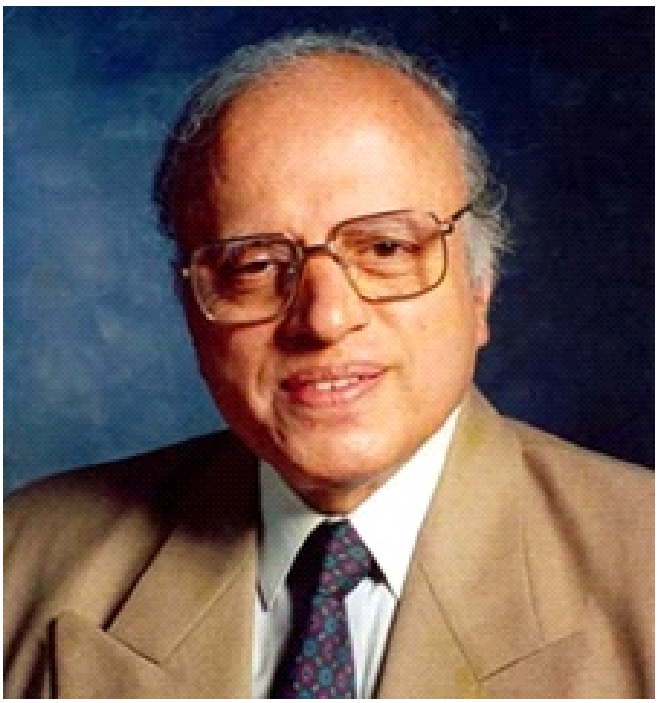
Incidentally, Sundargarh is the first district in the state to provide spirulina for child nourishment. Likewise, Odisha has become the first state in the whole of eastern India to initiate such a programme.

Spirulina chikki is prepared with spirulina powder, groundnut and jaggery. In the same way, spirulina powder is mixed with sugar to prepare a soft mix. Children are fond of eating spirulina items provided through the ICDS network.

Spirulina is a plant-based algae safe for human consumption. It is also known as a nutrition powerhouse being rich in nutrients, amino acids, proteins, minerals, sugars, vitamins B-1, B-2, B-3, B-4, B-12, Vitamin E, Vitamin K and Vitamin H. Spirulina is good for the eyes and helps in activating the brain. It boosts the immune system in the body and eliminates anaemia.

Food supplements like spirulina are generally regarded as safe, and are low cost and may prove to be beneficial to children especially in tribal belts where they are deprived of the nutrition they require.

Monkombu Sambasivan Swaminathan



Mankombu Sambasivan Swaminathan (born 7 August 1925) is an Indian agronomist, agricultural scientist, plant geneticist, administrator and humanitarian, is popularly known as the Father of Green Revolution in India.

Swaminathan was born in Kumbakonam, Madras Presidency on 7 August 1925. He was the second son of general surgeon Dr. M. K. Sambasivan and Parvati Thangammal Sambasivan who hailed from Alappuzha district in Kerala. After his father's death when he was 11, young Swaminathan was looked after by his father's brother.

Swaminathan was educated at a local high school and later at the Catholic Little Flower High School in Kumbakonam, from which he matriculated at age 15. Right from childhood, he had interaction with farming and farmers; his extended family grew rice, mangoes and coconut, later expanding into areas such as coffee. He saw the impact fluctuations in the price of crops had on his family, including the devastation that weather and pest could cause to crops as well as incomes.

His parents wanted him to study medicine. With that in mind, he took started off his higher education with zoology. But, when he witnessed the impacts of the Bengal famine of 1943 during the Second World War and shortages of rice throughout the sub-continent, he decided to devote his life to ensuring India had enough food. Despite his family background, and belonging to an era where medicine and engineering were considered much more prestigious, he chose agriculture.

He is the Founder Chairman, Emeritus Chairman and Chief Mentor of the M. S. Swaminathan Research Foundation (MSSRF) at Chennai, which he founded in 1988. Dr. Swaminathan obtained a B.Sc. degree in Zoology from the Maharajas College in Thiruvananthapuram, and also in Agricultural Sciences from the Coimbatore Agricultural College. Subsequently, he received M.Sc. degree in Agricultural Sciences (specializing in genetics and plant breeding) from the Indian Agricultural Research Institute (IARI) in 1949 and Ph.D. degree from Cambridge University, UK in 1952.

Dr. Swaminathan joined the faculty of IARI, New Delhi, in 1954. He became the Director of IARI (1961-72), Director General of Indian Council of Agricultural Research (ICAR) and Secretary to the Government of India, Department of Agricultural Research and Education (1972-79), Principal Secretary in the Ministry of Agriculture (1979-80), Acting Deputy Chairman and later Member (Science and Agriculture), Planning Commission (1980-82), and Director General, International Rice Research Institute, the Philippines (1982-88).

A plant geneticist by training, Dr. Swaminathan has made a stellar contribution to the agricultural renaissance of India and is widely regarded as the scientific leader of India's green revolution movement. His advocacy of sustainable agriculture leading to an evergreen revolution makes him an acknowledged world leader in the field of sustainable food security. The International Association of Women and Development conferred on him the first international award for significant contributions to promoting the knowledge, skill, and technological empowerment of women in agriculture, and for his pioneering role in mainstreaming gender considerations in agriculture and rural development. Dr. Swaminathan has received numerous awards and honours, including the S.S. Bhatnagar Award for his contribution to biological sciences (1961), Ramon Magsaysay Award for Community Leadership in 1971, the Albert Einstein World Science Award in 1986, the first World Food Prize in 1987, the Indira Gandhi Prize for Peace, Disarmament and Development, the Franklin D. Roosevelt Four Freedoms Medal and the Mahatma Gandhi Prize of UNESCO in 2000, and the Lal Bahadur Shastri National Award in 2007. Dr. Swaminathan is a proud recipient of some of India's highest honours including Padma Shri (1967), Padma Bhushan (1972) and Padma Vibhushan (1989). He is a Fellow of many of the leading scientific academies of India and the world, including the Royal Society of London and the US National Academy of Sciences. He has received 81 honorary doctorate degrees from universities around the world. He was a Member of the Parliament of India (Rajya Sabha) for the period 2007-13. He also chairs the Task Force set up by the Ministry of External Affairs to oversee the projects undertaken in Afghanistan and Myanmar in the field of agriculture and was elected the “Living Legend of International Union of Nutrition Sciences” at the 20th International Congress of Nutrition held at Granada, Spain.

Jokes

Patient: doctor, the nurse very good.
I feel very good when she touches me.
Doctor: i know, i heard the
voice of the slap too.

surgeons after operation..and medical students after exams tell the same thing..

we tried our best cant say anything right now..!

After English Exam

How Was The Paper ?

It Was Easy But Question 5 Confused Me

What Was the question?

Question 5 Wanted The Past Tense Of "Think",
I Thought & Thought & Thought
And End Up With Writing "Thinked"

Teacher: Correct the Sentence
"A Bull and Cow is Grazing in the Field"
Student: "A Cow and Bull is Grazing in the Field"
Teacher: How?
Student: Because Ladies First. LOL

Doctor: You should take at least 10 Glasses of water every day.
Patient: It is Impossible.
Doctor: Why?
Patient: I have only 4 Glasses at home..!

A guy in a mental hospital, placed two stones in his ears ..

The doctor asked him,
"What are you doing?"

he replied,
"I'm listening to ROCK music!"

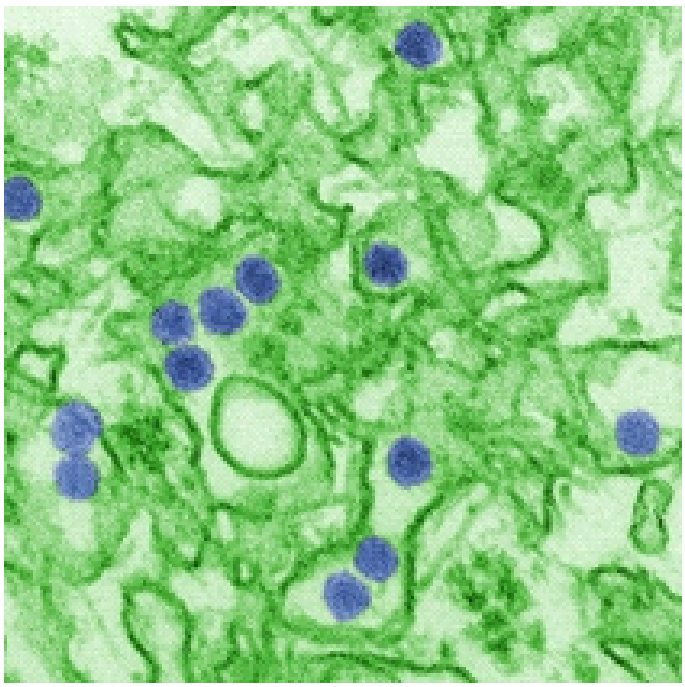
Father: Son this time, you have to score 90% marks in your exams.

Son: No father Ill score 100% marks.

Father: Why are you kidding?

Son: Who started?
🤣🤣🤣😂😂😂

Zika virus



Zika virus is a member of the virus family *Flaviviridae*. It is spread by daytime active *Aedes* mosquitoes, such as *A. aegypti* and *A. albopictus*. Its name comes from the Ziika Forest of Uganda, where the virus was first isolated in 1947. *Zika virus* shares a genus with the dengue, yellow fever, Japanese encephalitis, and West Nile viruses. Since the 1950s, it has been known to occur within a narrow equatorial belt from Africa to Asia. From 2007 to 2016, the virus spread eastward, across the Pacific Ocean to the Americas, leading to the 2015–2016 Zika virus epidemic.

The infection, known as Zika fever or *Zika virus* disease, often causes no or only mild symptoms, similar to a very mild form of dengue fever. While there is no specific treatment, paracetamol (acetaminophen) and rest may help with the symptoms. As of April 2019, no vaccines have been approved for clinical use, however several vaccines are currently in clinical trials. Zika can spread from a pregnant person to their baby. This can result in microcephaly, severe brain malformations, and other birth defects. Zika infections in adults may result rarely in Guillain–Barré syndrome.

In January 2016, the United States Centers for Disease Control and Prevention (CDC) issued travel guidance on affected countries, including the use of enhanced precautions, and guidelines for pregnant women including considering postponing travel. Other governments or health agencies also issued similar travel warnings, while Colombia, the Dominican Republic, Puerto Rico, Ecuador, El Salvador, and Jamaica advised women to postpone getting pregnant until more is known about the risks.

Zika virus belongs to the family *Flaviviridae* and the genus *Flavivirus*, thus is related to the dengue, yellow fever, Japanese encephalitis, and West Nile viruses. Like other flaviviruses, *Zika virus* is enveloped and icosahedral and has a nonsegmented, single-stranded, 10 kilobase, positive-sense RNA genome. It is most closely related to the Spondweni virus and is one of the two known viruses in the Spondweni virus clade.

A positive-sense RNA genome can be directly translated into viral proteins. As in other flaviviruses, such as the similarly sized West Nile virus, the RNA genome encodes seven nonstructural proteins and three structural proteins in the form of a single polyprotein (Q32ZE1). One of the structural proteins encapsulates the virus. This protein is the flavivirus envelope glycoprotein, that binds to the endosomal membrane of the host cell to initiate endocytosis. The RNA genome forms a nucleocapsid along with copies of the 12-kDa capsid protein. The nucleocapsid, in turn, is enveloped within a host-derived membrane modified with two viral glycoproteins. Viral genome replication depends on the making of double-stranded RNA from the single-stranded, positive-sense RNA (ssRNA(+)) genome followed by transcription and replication to provide viral mRNAs and new ssRNA(+) genomes.

A longitudinal study shows that 6 hours after cells are infected with *Zika virus*, the vacuoles and mitochondria in the cells begin to swell. This swelling becomes so severe, it results in cell death, also known as paraptosis. This form of programmed cell death requires gene expression. IFITM3 is a trans-membrane protein in a cell that can protect it from viral infection by blocking virus attachment. Cells are most susceptible to Zika infection when levels of IFITM3 are low. Once the cell has been infected, the virus restructures the endoplasmic reticulum, forming the large vacuoles, resulting in cell death.

There are two Zika lineages: the African lineage and the Asian lineage. Phylogenetic studies indicate that the virus spreading in the Americas is 89% identical to African genotypes, but is most closely related to the Asian strain that circulated igenotypes butesia during the 2013–2014 outbreak.The Asian strain appears to have first evolved around 1928.

The vertebrate hosts of the virus were primarily monkeys in a so-called enzootic mosquito-monkey-mosquito cycle, with only occasional transmission to humans. Before 2007, Zika "rarely caused recognized 'spillover' infections in humans, even in highly enzootic areas". Infrequently, however, other arboviruses have become established as a human disease and spread in a mosquito–human–mosquito cycle, like the yellow fever virus and the dengue fever virus (both flaviviruses), and the chikungunya virus (a togavirus). Though the reason for the pandemic is unknown, dengue, a related arbovirus that infects the same species of mosquito vectors, is known in particular to be intensified by urbanization and globalization. Zika is primarily spread by *Aedes aegypti* mosquitoes and can also be transmitted through sexual contact or blood transfusions. The basic reproduction number (R_0, a measure of transmissibility) of *Zika virus* has been estimated to be between 1.4 and 6.6 .

Transmission

Mosquito

Zika is primarily spread by the female *Aedes aegypti* mosquito, which is active mostly in the daytime. The mosquitos must feed

on blood to lay eggs. The virus has also been isolated from a number of arboreal mosquito species in the genus *Aedes*, such as *A. africanus*, *A. apicoargenteus*, *A. furcifer*, *A. hensilli*, *A. luteocephalus*, and *A. vittatus*, with an extrinsic incubation period in mosquitoes around 10 days.

The true extent of the vectors is still unknown. Zika has been detected in many more species of *Aedes*, along with *Anopheles coustani, Mansonia uniformis*, and *Culex perfuscus*, although this alone does not incriminate them as vectors. To detect the presence of the virus usually requires genetic material to be analysed in a lab using the technique RT-PCR. A much cheaper and faster method involves shining a light at the head and thorax of the mosquito, and detecting chemical compounds characteristic of the virus using near-infrared spectroscopy.

Sexual

Zika can be transmitted from men and women to their sexual partners; most known cases involve transmission from symptomatic men to women. As of April 2016, sexual transmission of Zika has been documented in six countries – Argentina, Australia, France, Italy, New Zealand, and the United States – during the 2015 outbreak. ZIKV can persist in semen for several months, with viral RNA detected up to one year. The virus replicates in the human testis, where it infects several cell types including testicular macrophages, peritubular cells and germ cells, the spermatozoa precursors. Semen parameters can be altered in patients for several weeks post-symptoms onset, and spermatozoa can be infectious. Since October 2016, the CDC has advised men who have traveled to an area with Zika should use condoms or not have sex for at least six months after their return as the virus is still transmissible even if symptoms never develop.

Pregnancy

Zika virus can spread by vertical (or "mother-to-child") transmission, during pregnancy or at delivery.An infection during pregnancy has been linked to changes in neuronal development of the unborn child. Severe progressions of infection have been linked to the development of microcephaly in the unborn child, while mild infections potentially can lead to neurocognitive disorders later in life. Congenital brain abnormalities other than microcephaly have also been reported after a Zika outbreak. Studies in mice have suggested that maternal immunity to dengue virus may enhance fetal infection with Zika, worsen the microcephaly phenotype and/or enhance damage during pregnancy, but it is unknown whether this occurs in humans.

Blood Transfusion

As of April 2016, two cases of Zika transmission through blood transfusions have been reported globally, both from Brazil, after which the US Food and Drug Administration (FDA) recommended screening blood donors and deferring high-risk donors for 4 weeks. A potential risk had been suspected based on a blood-donor screening study during the French Polynesian Zika outbreak, in which 2.8% (42) of donors from November 2013 and February 2014 tested positive for Zika RNA and were all asymptomatic at the time of blood donation. Eleven of the positive donors reported symptoms of Zika fever after their donation, but only three of 34 samples grew in culture.

Pathogenesis

Zika virus replicates in the mosquito's midgut epithelial cells and then its salivary gland cells. After 5–10 days, the virus can be found in the mosquito's saliva. If the mosquito's saliva is inoculated into human skin, the virus can infect epidermal keratinocytes, skin fibroblasts in the skin and the Langerhans cells. The pathogenesis of the virus is hypothesized to continue with a spread to lymph nodes and the bloodstream. Flaviviruses replicate in the cytoplasm, but Zika antigens have been found in infected cell nuclei.

The viral protein numbered NS4A can lead to small head size (microcephaly) because it disrupts brain growth by hijacking a pathway which regulates growth of new neurons. In fruit flies, both NS4A and the neighboring NS4B restrict eye growth.

Zika Fever

Zika fever (also known as *Zika virus* disease) is an illness caused by *Zika virus*. Around 80% of cases are estimated to be asymptomatic, though the accuracy of this figure is hindered by the wide variance in data quality, and figures from different outbreaks can vary significantly. Symptomatic cases are usually mild and can resemble dengue fever. Symptoms may include fever, red eyes, joint pain, headache, and a maculopapular rash. Symptoms generally last less than seven days. It has not caused any reported deaths during the initial infection. Infection during pregnancy causes microcephaly and other brain malformations in some babies. Infection in adults has been linked to Guillain–Barré syndrome (GBS) and Zika virus has been shown to infect human Schwann cells.

Diagnosis is by testing the blood, urine, or saliva for the presence of *Zika virus* RNA when the person is sick. In 2019, an improved diagnostic test, based on research from Washington University in St. Louis, that detects Zika infection in serum was granted market authorization by the FDA.

Prevention involves decreasing mosquito bites in areas where the disease occurs, and proper use of condoms. Efforts to prevent bites include the use of DEET or picaridin - based insect repellent, covering much of the body with clothing, mosquito nets, and getting rid of standing water where mosquitoes reproduce. There is no vaccine.[1] Health officials recommended that women in areas affected by the 2015–2016 Zika outbreak consider putting off pregnancy and that pregnant women not travel to these areas. While no specific treatment exists, paracetamol (acetaminophen) and rest may help with the symptoms. Admission to a hospital is rarely necessary.

New study links ultra-processed foods and colorectal cancer in men

For many Americans, the convenience of pre-cooked and instant meals may make it easy to overlook the less-than-ideal nutritional information, but a team led by researchers at the Tufts University and Harvard University hope that will change after recently discovering a link between the high consumption of ultra-processed foods and an increased risk of colorectal cancer.

In a study recently published in The BMJ, researchers found that men who consumed high rates of ultra-processed foods were at 29% higher risk for developing colorectal cancer—the third most diagnosed cancer in the United States—than men who consumed much smaller amounts. They did not find the same association in women.

"We started out thinking that colorectal cancer could be the cancer most impacted by diet compared to other cancer types," said Lu Wang, the study's lead author and a postdoctoral fellow at the Friedman School of Nutrition Science and Policy. "Processed meats, most of which fall into the category of ultra-processed foods, are a strong risk factor for colorectal cancer. Ultra-processed foods are also high in added sugars and low in fiber, which contribute to weight gain and obesity, and obesity is an established risk factor for colorectal cancer."

The study analyzed responses from over 200,000 participants—159,907 women and 46,341 men—across three large prospective studies which assessed dietary intake and were conducted over more than 25 years. Each participant was provided with a food frequency questionnaire every four years and asked about the frequency of consumption of roughly 130 foods.

For the study in BMJ, participants' intake of ultra-processed foods was then classified into quintiles, ranging in value from the lowest consumption to the highest. Those in the highest quintile were identified as being the most at risk for developing colorectal cancer. Although there was a clear link identified for men, particularly in cases of colorectal cancer in the distal colon, the study did not find an overall increased risk for women who consumed higher amounts of ultra-processed foods.

The Impacts of Ultra-Processed Foods

The analyses revealed differences in the ways that men and women consume ultra-processed foods and the prospective associated cancer risk. Out of the 206,000 participants followed for more than 25 years, the research team documented 1,294 cases of colorectal cancer among men, and 1,922 cases among women.

The team found the strongest association between colorectal cancer and ultra-processed foods among men come from the meat, poultry, or fish-based, ready-to-eat products. "These products include some processed meats like sausages, bacon, ham, and fish cakes. This is consistent with our hypothesis," Wang said.

The team also found higher consumption of sugar-sweetened beverages, like soda, fruit-based beverages, and sugary milk-based beverages, is associated with an increased risk of colorectal cancer in men.

However, not all ultra-processed foods are equally harmful with regard to colorectal cancer risk. "We found an inverse association between ultra-processed dairy foods like yogurt and colorectal cancer risk among women," said co-senior author Fang Fang Zhang, a cancer epidemiologist and interim chair of the Division of Nutrition Epidemiology and Data Science at the Friedman School.

Overall, there was not a link between ultra-processed food consumption and colorectal cancer risk among women. It's possible that the composition of the ultra-processed foods consumed by women could be different than that from men.

"Foods like yogurt can potentially counteract the harmful impacts of other types of ultra-processed foods in women," Zhang said.

Mingyang Song, co-senior author on the study and assistant professor of clinical epidemiology and nutrition at the Harvard T.H. Chan School of Public Health, added that, "Further research will need to determine whether there is a true sex difference in the associations, or if null findings in women in this study were merely due to chance or some other uncontrolled confounding factors in women that mitigated the association."

Although ultra-processed foods are often associated with poor diet quality, there could be factors beyond the poor diet quality of ultra-processed foods that impact the risk of developing colorectal cancer.

The potential role of food additives in altering gut microbiota, promoting inflammation, and contaminants formed during food processing or migrated from food packaging may all promote cancer development, Zhang noted.

Analyzing the Data

With more than a 90% follow-up rate from each of the three studies, the research team had ample data to process and review.

"Cancer takes years or even decades to develop, and from our epidemiological studies, we have shown the potential latency effect—it takes years to see an effect for certain exposure on cancer risk," said Song. "Because of this lengthy process, it's important to have long-term exposure to data to better evaluate cancer risk."

The studies included:

- The Nurses' Health Study (1986-2014): 121,700 registered female nurses between the ages of 30 and 55
- The Nurses' Health Study II (1991-2015): 116,429 female nurses between the ages of 25 and 42
- The Health Professional Follow-up Study (1986-2014): 51,529 male health professionals between the ages of 40 and 75.

After an exclusionary process for past diagnoses or incomplete surveys, the researchers were left with prospective data from 159,907 women from both NHS studies and 46,341 men.

The team adjusted for potential confounding factors such as race, family history of cancer, history of endoscopy, physical activity hours per week, smoking status, total alcohol intake and total caloric intake, regular aspirin use, and menopausal status.

Zhang is aware that since the participants in these studies all worked in the healthcare field, the findings for this population may not be the same as they would be for the general population, since the participants may be more inclined to eat healthier and lean away from ultra-processed foods. The data may also be skewed because processing has changed over the past two decades. "But we are comparing within that population those who consume higher amounts versus lower amounts," Zhang reassured. "So those comparisons are valid."

Mental Hygiene

For most people, the concept of hygiene conjures up images of brushing your teeth, applying deodorant or taking a shower: simple, daily practices to keep your body clean and healthy.

But mental health providers say your mind can also benefit from a quick morning tune-up. Spending even 15 minutes on mental health hygiene each day can bring a host of benefits, from improved mood and better relationships to even deeper concentration and enhanced creativity.

Adopting good mental health management practices is a critical first step in building the foundation for overall wellness.

Surround yourself with good people.
People with supportive family members and friends are generally healthier than those who lack a support system. If you are struggling to find this, seek out activities where you can meet new people, such as volunteer opportunities, a new hobby or a support group.

Value your own self-worth.
Treat yourself with kindness, respect and grace, avoiding self-critique. Take time to do the things you enjoy and arm yourself with the knowledge that you are doing the best you can.

Set realistic goals.
Decide what matters most to you in life, whether that's academically, professionally or socially. Write down those goals and include the steps you need to take in order to achieve them. Focus on attainable goals and enjoy the sense of accomplishment you feel after completing them.

Know your resources.
Plenty of mental health resources exist online and in your community. Furthermore, most employers offer an Employee Assistance Program, which may offer free or reduced-cost counselling or therapy, and a plethora of other resources. Colleges and universities also have mental health resources.

Know your rights.
Being informed is the best way to empower yourself in the event that you encounter discrimination.

Create work life balance.
Whether you're going into work or working from home, you may benefit from creating stricter boundaries around your job. Set a distinct end to your workday, you might feel stuck in work mode even when you stop working for the day.

Highlights of the coming issue

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