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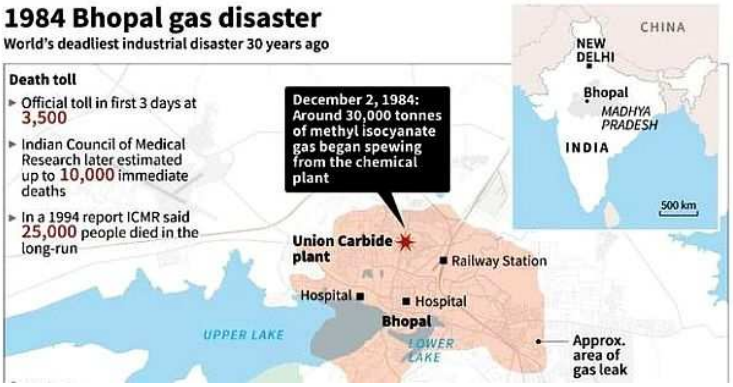
ASSE India – Newsletter Committee
Sandip Mukherjee

BHOPAL GAS TRAGEDY

33 YEARS OF HORROR

Memorial by Dutch artist Ruth Kupferschmidt for those killed and disabled by the 1984 toxic gas release



Content:

Editor's Corner:

Dear Reader,

We are presenting the 45th Issue of ASSE India Chapter Newsletter.

Every year December month is reminding us the worst tragedy of Bhopal. 33 years back, on a cold December night of 1984, Bhopal was struck by one of the worst industrial disasters when 40 tons of poisonous Methyl Isocyanate gas leaked from the Union Carbide factory, killing over 2000 people immediately and affecting over 5 lakh. Since then survivors of the Bhopal gas tragedy have been protesting seeking justice and adequate compensation. Activists claim even now over 5 lakh people suffer from the effects of the tragedy; they say many of the second and third generation children are born with congenital defects, cerebral palsy, and even cancer. When Union Carbide abandoned the factory, it left behind pollution that has never been cleaned up. For decades, people living nearby were forced to drink water contaminated by these pollutants, leading to debilitating illness. To commemorate the day, furnishing a small description, cause and effects of this disaster.

Also read a very useful health topic on how vitamin supplements are useful in prevention of eye disease.

The issue is furnished with information on forthcoming important days in SHE calendar and the history or background of those days. Of-course, your favorite quiz contest is also there.

Members are invited to join in forthcoming Webinar on 8th December. See the detail inside.

Do keep on sending interesting articles on OH&S for publication. Happy reading.

Warm Regards to all our Readers,
Sandip Mukherjee,
Chair – Newsletter (ASSE India Chapter)

Bhopal Gas Tragedy

The **Bhopal disaster**, also referred to as the **Bhopal gas tragedy**, was a gas leak incident in India, considered the world's worst industrial disaster.

It occurred on the night of 2–3 December 1984 at the Union Carbide India Limited (UCIL) pesticide plant in Bhopal, Madhya Pradesh. Over 500,000 people were exposed to methyl isocyanate (MIC) gas and other chemicals. The highly toxic substance made its way into and around the shanty towns located near the plant.

Estimates vary on the death toll. The official immediate death toll was 2,259. The government of Madhya Pradesh confirmed a total of 3,787 deaths related to the gas release. A government affidavit in 2006 stated that the leak caused 558,125 injuries, including 38,478 temporary partial injuries and approximately 3,900 severely and permanently disabling injuries. Others estimate that 8,000 died within two weeks, and another 8,000 or more have since died from gas-related diseases.

The cause of the disaster remains under debate. The Indian government and local activists argue that slack management and deferred maintenance created a situation where routine pipe maintenance caused a backflow of water into a MIC tank, triggering the disaster. Union Carbide Corporation (UCC) contends water entered the tank through an act of sabotage.

The owner of the factory, UCIL, was majority owned by UCC, with Indian Government-controlled banks and the Indian public holding a 49.1 percent stake. In 1989, UCC paid $470 million ($907 million in 2014 dollars) to settle litigation stemming from the disaster. In 1994, UCC sold its stake in UCIL to Eveready Industries India Limited (EIIL), which subsequently merged with McLeod Russel (India) Ltd. Eveready ended clean-up on the site in 1998, when it terminated its 99-year lease and turned over control of the site to the state government of Madhya Pradesh. Dow Chemical Company purchased UCC in 2001, seventeen years after the disaster.

Civil and criminal cases were filed in the District Court of Bhopal, India, involving UCC and Warren Anderson, UCC CEO at the time of the disaster. In June 2010, seven former employees, including the former UCIL chairman, were convicted in Bhopal of causing death by negligence and sentenced to two years imprisonment and a fine of about $2,000 each, the maximum punishment allowed by Indian law. An eighth former employee was also convicted, but died before the judgment was passed. Anderson died on 29 September 2014.

Liquid MIC Storage

The Bhopal UCIL facility housed three underground 68,000 liters liquid MIC storage tanks: E610, E611, and E619. In the months leading up to the December leak, liquid MIC production was in progress and being used to fill these tanks. UCC safety regulations specified that no one tank should be filled more than 50% (here, 30 tons) with liquid MIC. Each tank was pressurized with inert nitrogen gas. This pressurization allowed liquid MIC to be pumped out of each tank as needed, and also kept impurities out of the tanks.

In late October 1984, tank E610 lost the ability to hold most of its nitrogen gas pressure. It meant that the liquid MIC contained within could not be pumped out. At the time of this failure, tank E610 contained 42 tons of liquid MIC. Shortly after this failure, MIC production was halted at the Bhopal facility, and parts of the plant were shut down for maintenance. Maintenance included the shutdown of the plant's flare tower so that a corroded pipe could be repaired. With the flare tower still out of service, production of carbaryl was resumed in late November, using MIC stored in the two tanks still in service. An attempt to re-establish pressure in tank E610 on 1 December failed, so the 42 tons of liquid MIC contained within still could not be pumped out of it.

The Release

In early December 1984, most of the plant's MIC related safety systems were not functioning and many valves and lines were in poor condition. In addition, several vent gas scrubbers had been out of service as well as the steam boiler, intended to clean the pipes. During the late evening hours of 2 December 1984, water was believed to have entered a side pipe and into Tank E610 whilst trying to unclog it, which contained 42 tons of MIC that had been there since late October. Introduction of water into the tank began a runaway exothermic reaction, which was accelerated by contaminants, high ambient temperatures and other factors, such as the presence of iron from corroding non-stainless steel pipelines. The pressure in tank E610, normal at 10:30 p.m., had increased by a factor of five to 10 psi (34.5 to 69 kPa) by 11 p.m. Two different senior refinery employees assumed the reading was instrumentation malfunction. By 11:30 p.m., workers in the MIC area were feeling the effects of minor exposure to MIC gas, and began to look for a leak. One was found by 11:45 p.m., and reported to the MIC supervisor on duty at the time. The decision was made to address the problem after a 12:15 a.m. tea break, and in the meantime, employees were instructed to continue looking for leaks. The leak was discussed by MIC area employees during the break.

In the five minutes after the tea break ended at 12:40 a.m., the reaction in tank E610 quickly reached a critical state. Temperatures in the tank were indicated off its scale, maxed out beyond 25 °C (77 °F), and the pressure in the tank was indicated at 40 psi (275.8 kPa). One employee witnessed a

concrete slab above tank E610 crack as the emergency relief valve burst open, and pressure in the tank continued to increase to 55 psi (379.2 kPa) even after atmospheric venting of toxic MIC gas had begun. Direct atmospheric venting should have been prevented or at least partially mitigated by at least three safety devices which were not working properly, not in use, or insufficiently sized:

- A refrigeration system meant to cool tanks containing liquid MIC, shut down in January 1982, and whose freon had been removed in June 1984. Since the MIC storage system assumed refrigeration, its high temperature alarm, set to sound at 11 °C (52 °F) had long since been disconnected, and tank storage temperatures ranged between 15 °C (59 °F) and 40 °C (104 °F).
- A flare tower, to burn the MIC gas as it escaped, which had had a connecting pipe removed for maintenance, and was improperly sized to deal with a leak of the size produced by tank E610.
- A vent gas scrubber, which had been turned off at the time and was in 'standby' mode, and had insufficient caustic soda and power to deal with a leak of the magnitude produced.

About 30 metric tons of MIC escaped from the tank into the atmosphere in 45 to 60 minutes. This would increase to 40 metric tons within two hours' time. The gases were blown in a southeasterly direction over Bhopal.

A UCIL employee triggered the plant's alarm system at 12:50 a.m. as the concentration of gas in and around the plant became difficult to tolerate. Activation of the system triggered two siren alarms: one that sounded inside the UCIL plant, and a second directed outward to the public and the city of Bhopal. The two siren systems had been decoupled from one another in 1982, so that it was possible to leave the factory warning siren on while turning off the public one, and this is exactly what was done: the public siren briefly sounded at 12:50 a.m. and was quickly turned off, as per company procedure meant to avoid alarming the public around the factory over tiny leaks. Workers, meanwhile, evacuated the UCIL plant, travelling upwind.

Bhopal's superintendent of police was informed by telephone, by a town inspector, that residents of the neighborhood of Chola (about 2 km from the plant) were fleeing a gas leak at approximately 1 a.m. Calls to the UCIL plant by police between 1:25 and 2:10 a.m. gave assurances twice that "everything is OK", and on the last attempt made, "we don't know what has happened, sir". With the lack of timely information exchange between UCIL and Bhopal authorities, the city's Hamidia Hospital was first told that the gas leak was suspected to be ammonia, then phosgene. They were then told that it was "MIC", which hospital staff had never heard of, had no antidote for, and received no immediate information about.

The MIC gas leak emanating from tank E610 petered out at approximately 2:00 a.m. Fifteen minutes later, the plant's public siren was sounded for an extended period of time, after first having been quickly silenced an hour and a half earlier. Some minutes after the public siren sounded, a UCIL employee walked to a police control room to both inform them of the leak (their first acknowledgement that one had occurred at all), and that "the leak had been plugged." Most city residents who were exposed to the MIC gas were first made aware of the leak by exposure to the gas itself or by opening their doors to investigate commotion, rather than having been instructed to shelter in place, or to evacuate before the arrival of the gas in the first place.

Acute Effects

The initial effects of exposure were coughing, severe eye irritation and a feeling of suffocation, burning in the respiratory tract, blepharospasm, breathlessness, stomach pains and vomiting. People awakened by these symptoms fled away from the plant. Those who ran inhaled more than those who had a vehicle to ride. Owing to their height, children and other people of shorter stature inhaled higher concentrations.

Thousands of people had died by the following morning.

Primary causes of deaths were choking, reflexogenic circulatory collapse and pulmonary oedema. Findings during autopsies revealed changes not only in the lungs but also cerebral oedema, tubular necrosis of the kidneys, fatty degeneration of the liver and necrotising enteritis. The stillbirth rate increased by up to 300% and neonatal mortality rate by around 200%.

Gas Cloud Composition

Apart from MIC, the gas cloud most likely also contained chloroform, dichoromethane, hydrogen chloride,monomethyl amine, dimethylamine, trimethylamine and carbon dioxide, either present in the tank or produced in the storage tank when reacted. As the gas cloud was composed mainly of materials denser than the surrounding air, it stayed close to the ground and spread in the southeasterly direction affecting the nearby communities. The chemical reactions may have produced a liquid or solid aerosol. Laboratory investigations by CSIR and UCC scientists failed to demonstrate the presence of hydrogen cyanide.

Immediate Aftermath

In the immediate aftermath, the plant was closed to outsiders (including UCC) by the Indian government, which subsequently failed to make data public, contributing to the confusion. The initial investigation was conducted entirely by the Council of Scientific and Industrial Research (CSIR) and the Central Bureau of Investigation. The UCC chairman and CEO Warren Anderson, together with a technical team, immediately traveled to India. Upon arrival Anderson was placed under house arrest and urged by the Indian government to leave the country within 24 hours. Union Carbide organized a team of international medical experts, as well as supplies and equipment, to work with the local Bhopal medical community, and the UCC technical team began assessing the cause of the gas leak.

The health care system immediately became overloaded. In the severely affected areas, nearly 70 percent were under-

qualified doctors. Medical staffs were unprepared for the thousands of casualties. Doctors and hospitals were not aware of proper treatment methods for MIC gas inhalation.

There were mass funerals and cremations. Photographer Pablo Bartholemew, on commission with press agency Rapho, took an iconic color photograph of a burial on December 4, *Bhopal gas disaster girl.* Another photographer present, Raghu Rai, took a black and white photo. The photographers did not ask for the identity of the father or child as she was buried, and no relative has since confirmed it. As such, the identity of the girl remains unknown. Both photos became symbolic of the suffering of victims of the Bhopal disaster, and Bartholomew's went on to win the 1984 World Press Photo of the Year.

Within a few days, trees in the vicinity became barren and bloated animal carcasses had to be disposed of. 170,000 people were treated at hospitals and temporary dispensaries; 2,000 buffalo, goats, and other animals were collected and buried. Supplies, including food, became scarce owing to suppliers' safety fears. Fishing was prohibited causing further supply shortages.

Lacking any safe alternative, on 16 December, tanks 611 and 619 were emptied of the remaining MIC by reactivating the plant and continuing the manufacture of pesticide. Despite safety precautions such as having water carrying helicopters continually overflying the plant, this led to a second mass evacuation from Bhopal. The Government of India passed the "Bhopal Gas Leak Disaster Act" that gave the government rights to represent all victims, whether or not in India. Complaints of lack of information or misinformation were widespread. An Indian government spokesman said, "Carbide is more interested in getting information from us than in helping our relief work".

Formal statements were issued that air, water, vegetation and foodstuffs were safe, but warned not to consume fish. The number of children exposed to the gases was at least 200,000. Within weeks, the State Government established a number of hospitals, clinics and mobile units in the gas-affected area to treat the victims.

Long-term Health Effects

Some data about the health effects are still not available. The Indian Council of Medical Research (ICMR) was forbidden to publish health effect data until 1994.

A total of 36 wards were marked by the authorities as being "gas affected," affecting a population of 520,000. Of these, 200,000 were below 15 years of age, and 3,000 were pregnant women. The official immediate death toll was 2,259, and in 1991, 3,928 deaths had been officially certified. Ingrid Eckerman estimated 8,000 died within two weeks.

The government of Madhya Pradesh confirmed a total of 3,787 deaths related to the gas release.

Later, the affected area was expanded to include 700,000 citizens. A government affidavit in 2006 stated the leak caused 558,125 injuries including 38,478 temporary partial injuries and approximately 3,900 severely and permanently disabling injuries.

A cohort of 80,021 exposed people was registered, along with a control group, a cohort of 15,931 people from areas not exposed to MIC. Nearly every year since 1986, they have answered the same questionnaire. It shows overmortality and overmorbidity in the exposed group. Bias and confounding factors cannot be excluded from the study. Because of migration and other factors, 75% of the cohort is lost, as the ones who moved out are not followed.

A number of clinical studies are performed. The quality varies, but the different reports support each other. Studied and reported long term health effects are:

- Eyes: Chronic conjunctivitis, scars on cornea, corneal opacities, early cataracts
- Respiratory tracts: Obstructive and/or restrictive disease, pulmonary fibrosis, aggravation of TB and chronic bronchitis
- Neurological system: Impairment of memory, finer motor skills, numbness etc.
- Psychological problems: Post traumatic stress disorder (PTSD)
- Children's health: Peri and neonatal death rates increased. Failure to grow, intellectual impairment, etc.

Missing or insufficient fields for research are female reproduction, chromosomal aberrations, cancer, immune deficiency, neurological sequelae, post-traumatic stress disorder (PTSD) and children born after the disaster. Late cases that might never be highlighted are respiratory insufficiency, cardiac insufficiency (cor pulmonale), cancer and tuberculosis.

A 2014 report in Mother Jones quotes a "spokesperson for the Bhopal Medical Appeal, which runs free health clinics for survivors" as saying "An estimated 120,000 to 150,000 survivors still struggle with serious medical conditions including nerve damage, growth problems, gynecological disorders, respiratory issues, birth defects, and elevated rates of cancer and tuberculosis.

Ongoing Contamination

Chemicals abandoned at the plant continue to leak and pollute the groundwater. Whether the chemicals pose a health hazard is disputed. Contamination at the site and surrounding area was not caused by the gas leakage. The area around the plant was used as a dumping ground for hazardous chemicals and by 1982 water wells in the vicinity of the UCIL factory had to be abandoned. UCC states that "after the incident, UCIL began clean-up work at the site under the direction of Indian central and state government authorities", which was continued after

1994 by the successor to UCIL. The successor, Eveready Industries India, Limited (EIIL), ended cleanup on the site in 1998, when it terminated its 99-year lease and turned over control of the site to the state government of Madhya Pradesh.

UCC's laboratory tests in 1989 revealed that soil and water samples collected from near the factory were toxic to fish. Twenty-one areas inside the plant were reported to be highly polluted. In 1991 the municipal authorities declared that water from over 100 wells was hazardous for health if used for drinking. In 1994 it was reported that 21% of the factory premises were seriously contaminated with chemicals. Beginning in 1999, studies made by Greenpeace and others from soil, groundwater, well water and vegetables from the residential areas around UCIL and from the UCIL factory area show contamination with a range of toxic heavy metals and chemical compounds. Substances found, according to the reports, are naphthol, naphthalene, Sevin, tarry residues, alpha naphthol, mercury, organochlorines, chromium, copper, nickel, lead, hexachlorethane, hexachlorobutadiene, pesticide HCH (BHC), volatile organic compounds and halo-organics. Many of these contaminants were also found in breast milk of women living near the area. Soil tests were conducted by Greenpeace in 1999. One sample (IT9012) from "sediment collected from drain under former Sevin plant" showed mercury levels to be at "20,000 and 6 million times" higher than expected levels. Organochlorine compounds at elevated levels were also present in groundwater collected from (sample IT9040) a 4.4 meter depth "bore-hole within the former UCIL site". This sample was obtained from a source posted with a warning sign which read "Water unfit for consumption". Chemicals that have been linked to various forms of cancer were also discovered, as well as trichloroethylene, known to impair fetal development, at 50 times above safety limits specified by the U.S. Environmental Protection Agency (EPA). In 2002, an inquiry by Fact-Finding Mission on Bhopal found a number of toxins, including mercury, lead, 1, 3, 5 trichlorobenzene, dichloromethane and chloroform, in nursing women's breast milk.

A 2004 BBC Radio 5 broadcast reported the site is contaminated with toxic chemicals including benzene hexachloride and mercury, held in open containers or loose on the ground. A drinking water sample from a well near the site had levels of contamination 500 times higher than the maximum limits recommended by the World Health Organization. In 2009, the Centre for Science and Environment, a Delhi-based pollution monitoring lab, released test results showing pesticide groundwater contamination up to three kilometers from the factory. Also in 2009, the BBC took a water sample from a frequently used hand pump, located just north of the plant. The sample, tested in UK, was found to contain 1,000 times the World Health Organization's recommended maximum amount of carbon tetrachloride, a carcinogenic toxin.

In 2010, a British photojournalist who ventured into the abandoned Union Carbide factory to investigate allegations of abandoned, leaking toxins, was hospitalized in Bhopal for a week after he was exposed to the chemicals. Doctors at the Sambhavna Clinic treated him with oxygen, painkillers and anti-inflammatories following a severe respiratory reaction to toxic dust inside the factory.

In October 2011, the Institute of Environmental Management and Assessment published an article and video by two British environmental scientists, showing the current state of the plant, landfill and solar evaporation ponds and calling for renewed international efforts to provide the necessary skills to clean up the site and contaminated groundwater.

Cause of Disaster

There are two main lines of argument involving the disaster. The "Corporate Negligence" point of view argues that the disaster was caused by a potent combination of under-maintained and decaying facilities, a weak attitude towards safety, and an undertrained workforce, culminating in worker actions that inadvertently enabled water to penetrate the MIC tanks in the absence of properly working safeguards.

The "Worker Sabotage" point of view argues that it was not physically possible for the water to enter the tank without concerted human effort, and that extensive testimony and engineering analysis leads to a conclusion that water entered the tank when a rogue individual employee hooked a water hose directly to an empty valve on the side of the tank. This point of view further argues that the Indian government took extensive actions to hide this possibility in order to attach blame to UCC.

Theories differ as to how the water entered the tank. At the time, workers were cleaning out a clogged pipe with water about 400 feet from the tank. They claimed that they were not told to isolate the tank with a pipe slip-blind plate. The operators assumed that owing to bad maintenance and leaking valves, it was possible for the water to leak into the tank.

This water entry route could not be reproduced despite strenuous efforts by motivated parties. UCC claims that a "disgruntled worker" deliberately connecting a hose to a pressure gauge connection was the real cause.

Early the next morning, a UCIL manager asked the instrument engineer to replace the gauge. UCIL's investigation team found no evidence of the necessary connection; the investigation was totally controlled by the government, denying UCC investigators access to the tank or interviews with the operators.

Source: https://en.wikipedia.org

Important days in Safety, Health and Environmental Calendar of December, 2017

World AIDS Day 01 Dec 2017

World aids day is celebrated every year all over the world on 1st of December to raise the public awareness about AIDS (Acquired Immuno Deficiency Syndrome). AIDS is a pandemic disease caused due to the infection of Human Immunodeficiency Virus (HIV). The day is celebrated by the government organizations, NGOs, civil society and other health officials by organizing the speeches or forums discussion related to the AIDS.

The President of United States declared an official announcement for World AIDS Day in the year 1995 which was started following by other countries all across the world. According to the rough estimation, around 25 million people died from 1981 to 2007 because of the HIV infection. Even after the access of antiretroviral treatment at many places, around 2 million people (at least 270,000 of total were children) in 2007 were infected with this epidemic disease.

World AIDS Day celebration has become the most recognized health days celebrations internationally. World AIDS Day celebration offers the key opportunity to the health organizations to increase the awareness among people, most possible access to the treatment as well as discussing the preventive measures.

World AIDS Day History

World AIDS Day was first visualized by the Thomas Netter and James W. Bunn in the month of August in 1987. Thomas Netter and James W. Bunn both are the public information officers for the AIDS Global Program at the WHO (World Health Organization) in Geneva, Switzerland. They had shared their idea about the AIDS day to Dr. Jonathan Mann (Director of the AIDS Global Program), who had approved the idea and recommended the World AIDS Day observance on 1st of December in the year 1988.

The Joint United Nations Program on HIV/AIDS, also known as the UNAIDS, came into effect in the year 1996 and started promoting worldwide. Instead of being celebrated for only one day, World AIDS Campaign was launched by the UNAIDS in the year 1997 to focus on the AIDS programs, better communications, disease prevention and disease awareness learning for whole year.

In the starting years, the World AIDS Day themes were focused only on the children as well as the young people, which were later recognized as a family disease as any person of any age group can be infected with HIV.

Objectives of world AIDS day

The purpose of the World Aids Day celebration every year to well support the Member States in order to build up the new and effective policies and programs, to strengthen the health systems as well as to increase the capacity of health sectors towards HIV/AIDS. Some of the main objectives of the World Aids Day are listed below:

- To guide the member states for globally increasing the prevention and control measures for HIV/AIDS.
- To offer the member states a technical support for implementing the plan for prevention, care as well as treatment for HIV/AIDS including the testing, counseling of mother for transmitting the infection to the child, STI control and antiretroviral therapy.
- To aware people about the antiretroviral medicines or other commodities which can help them to fight against HIV/AIDS.
- To involve the peer groups in the campaign for getting the most effective result.
- To encourage more students from the schools, universities and social structures to contribute in the competitions organized for the AIDS.
- To decrease and control the number of patients infected by HIV/AIDS as well as to encourage the peer groups for condom.

Theme of World AIDS Day

In 2015, global leaders signed up to the Sustainable Development Goals, with the aim to achieve universal health coverage (UHC) by 2030. The UHC framework now lies at the center of all health programs.

To complement the global World AIDS Day 2017 campaign which promotes the theme **"Right to health"**, the World Health Organization will highlight the need for all 36.7 million people living with HIV and those who are vulnerable and affected by the epidemic, to reach the goal of universal health coverage.

Source: http://www.indiacelebrating.com

International Day for the Abolition of Slavery 02 Dec 2017

Slavery is not merely a historical relic. According to the International Labor Organization (ILO) more than 40 million people worldwide are victims of modern slavery. Although modern slavery is not defined in law, it is used as an umbrella term covering practices such as forced labor, debt bondage, forced marriage, and human trafficking. Essentially, it refers to situations of exploitation that a person cannot refuse or leave because of threats, violence, coercion, deception, and/or abuse of power.

In addition, more than 150 million children are subject to child labor, accounting for almost one in ten children around the world.

Facts and Figures:

- An estimated **40.3 million people** are in modern slavery, including **24.9 in forced labor** and **15.4 million in forced marriage.**
- There are 5.4 victims of modern slavery for every 1,000 people in the world.
- **1 in 4 victims** of modern slavery are **children.**
- Out of the 24.9 million people trapped in forced labour, **16 million people** are exploited in the **private sector** such as domestic work, construction or

agriculture; **4.8 million** people in forced **sexual exploitation**, and **4 million people** in forced labor imposed by **state authorities.**

- **Women and girls** are disproportionately affected by forced labour, accounting for **99% of victims** in the commercial **sex industry**, and 58% in other sectors.

ILO has adopted a new legally binding Protocol designed to strengthen global efforts to eliminate forced labor, which entered into force in November 2016.

The 50 for Freedom campaign aims to persuade at least 50 countries to ratify the Forced Labor Protocol by 2018.

Background

The International Day for the Abolition of Slavery, 2 December, marks the date of the adoption, by the General Assembly, of the United Nations Convention for the Suppression of the Traffic in Persons and of the Exploitation of the Prostitution of Others (resolution 317(IV) of 2 December 1949).

The focus of this day is on eradicating contemporary forms of slavery, such as trafficking in persons, sexual exploitation, the worst forms of child labor, forced marriage, and the forced recruitment of children for use in armed conflict.

Main forms of Modern Slavery

Slavery has evolved and manifested itself in different ways throughout history. Today some traditional forms of slavery still persist in their earlier forms, while others have been transformed into new ones.

The UN human rights bodies have documented the persistence of old forms of slavery that are embedded in traditional beliefs and customs. These forms of slavery are the result of long-standing discrimination against the most vulnerable groups in societies, such as those regarded as being of low caste, tribal minorities and indigenous peoples.

Forced Labor

Alongside traditional forms of forced labor, such as bonded labor and debt bondage there now exist more contemporary forms of forced labor, such as migrant workers, who have been trafficked for economic exploitation of every kind in the world economy: work in domestic servitude, the construction industry, the food and garment industry, the agricultural sector and in forced prostitution.

Child Labor

According to data provided by UNICEF, globally, one child out of every six works. The majority of the child labor that occurs today is for economic exploitation. That goes against the Convention on the Rights of the Child, which recognizes "the right of the child to be protected from economic exploitation and from performing any work that is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral or social development".

Trafficking

According to the Protocol to Prevent, Suppress and Punish Trafficking in Persons Especially Women and Children, trafficking in persons means the recruitment, transportation, transfer, harboring or receipt of persons, by means of the threat or use of force or other forms of coercion for the purpose of exploitation. Exploitation includes prostitution of others or other forms of sexual exploitation, forced labor or services, slavery or practices similar to slavery, servitude or the removal of organs. The consent of the person trafficked for exploitation is irrelevant and if the trafficked person is a child, it is a crime even without the use of force.

Source: http://www.un.org

National Pollution Control Day 02 Dec 2017

The National Pollution Control Day is observed every year on 2nd of December in India in order to give the honor and memorialize the thousands of human beings who had lost their existence because of the Bhopal gas calamity. Bhopal gas tragedy was happened in the night of 2nd and 3rd December in the year 1984 because of the unintentional discharge of the poisonous chemical known as Methyl Isocyanate (also called MIC) as well as some other chemicals released from the Union Carbide Chemical Plant positioned in the city. According to the report, more than 500,000 people (of which around 2259 were died immediately) were exposed to the poisonous gas of MIC. Later, it was declared by the government of Madhya Pradesh that around 3,787 deaths were related to the gas tragedy. In the next 72 hours, around 8,000 to 10,000 people were died whereas around 25,000 people were died later because of the gas-related diseases. It was identified as the biggest industrial pollution disaster of the history worldwide which needed serious preventive measures suddenly in order to stay away from such type of disaster in the future.

Objectives of the day:

- To spread awareness on managing and controlling industrial disasters
- To prevent the pollution produced by industrial processes or human negligence
- To make people and industries aware about the importance of pollution control acts

Some of the Prevention Methods taken by the Indian Legislation:

Indian government has launched the variety of serious acts and rules for the control and prevention of pollution all over the India. Some of are:

- Water (Prevention & Control of Pollution) Act of 1974
- Water (Prevention & Control of Pollution) Cess Act of 1977
- Air (Prevention & Control of Pollution) Act of 1981
- Environment (Protection) Rules of 1986
- Environment (Protection) Act of 1986
- Manufacture, Storage and Import of Hazardous Chemical Rules of1989
- Hazardous Waste (Management & Handling) Rules of 1989

- Manufacture, Storage, Import, Export & Storage of Hazardous Micro- Organisms Genetically Engineered Organisms or Cells Rules of 1989
- Chemical Accidents (Emergency, Planning, Preparedness and Response) Rules of 1996
- Bio-Medical Waste (Management & Handling) Rules of 1998
- Recycled Plastics Manufacture & Usage Rules of 1999
- Ozone Depleting Substances (Regulation) Rules of 2000
- Noise Pollution (Regulation & Control) Rules of 2000
- Municipal Solid Waste (Management & Handling) Rules of 2000
- Batteries (Management & Handling) Rules of 2001.
- Maharashtra Bio- Degradable Garbage (Control) Ordinance of 2006
- Environment Impact Assessment Notification of 2006

Source: http://www.indiacelebrating.com

International Day of Persons with Disabilities 03 December 2017

The annual observance of the International Day of Persons with Disabilities was proclaimed by the United Nations General Assembly resolution 47/3 in 1992. It aims to promote the rights and well-being of persons with disabilities in all spheres of society and development, and to increase awareness of on the situation of persons with disabilities in every aspect of political, social, economic and cultural life.

Building on many decades of UN's work in the field of disability, the Convention on the Rights of Persons with Disabilities, adopted in 2006, has further advanced the rights and well-being of persons with disabilities in the implementation of the 2030 Agenda for Sustainable Development and other international development frameworks, such as the Sendai Framework for Disaster Risk Reduction, the Charter on Inclusion of Persons with Disabilities in Humanitarian Action, the New Urban Agenda, and the Addis Ababa Action Agenda on Financing for Development.

The theme for this year's IDPD is **"Transformation towards sustainable and resilient society for all".**

The 2030 Agenda pledges to "leave no one behind". Persons with disabilities, as both beneficiaries and agents of change, can fast track the process towards inclusive and sustainable development and promote resilient society for all, including in the context of disaster risk reduction and humanitarian action, and urban development. Governments, persons with disabilities and their representative organizations, academic institutions and the private sector need to work as a "team" to achieve the Sustainable Development Goals (SDGs).

How you can commemorate IDPD 2017 in your local community

Include: Observance of the Day provides opportunities for collaborative and inclusive events by all stakeholders – Governments, the UN system, civil society and organizations of persons with disabilities – to focus on issues related to the inclusion of persons with disabilities in society and development, both as beneficiaries and agents of change.

Organize: Hold forums, public discussions and information campaigns in support of the themes of IDPD 2015 to discuss and share ways of including and empowering persons of all abilities to develop and be fully included in their local communities.

Celebrate: Plan and organize performances everywhere to celebrate the contributions made by persons with disabilities as agents of change in the communities in which they live. Celebrate persons with disabilities by creating opportunities to help realize their potential, be it through music, sport, academia or interpersonal skills.

Take Action: A major focus of the Day is practical action to realize the objectives of the Day for persons with disabilities and their communities. So, highlight best practices and think about making recommendations to your local political leaders, businesses, academic institutions, cultural centers and others. Work to ensure that your activity leaves a legacy and brings about lasting change.

Source: http://www.un.org

Human Rights Day 10 Dec 2017

Human Rights Day is commemorated every year all over the world on 10th of December. It was first announced to be observed every year by the United Nations General Assembly on 10th of December in the year 1948. It is celebrated at this particular date annually to honor the United Nations General Assembly for declaring the human rights universally. Human rights day was officially established in the meeting of United Nations General Assembly on 4th of December in 1950.

All the member states and interested organizations were invited to celebrate this day. The High Commissioner office of the Human Rights was awarded by the Guinness World Record for the collection, translation (around 380 languages) and distribution of the worldwide announcement of the Human Rights. At this event celebration, a global discussion on the human rights is also hosted by the High Commissioner through the social media websites.

How it is observed

The day is celebrated by organizing the political conferences, meetings, exhibitions, cultural events, debates and many more programs to discuss all the issues of human rights. Several governmental, civil and nongovernmental associations actively take part in the human rights event celebration.

Human rights day is celebrated by deciding a particular theme to make this celebration more effective and successful. Human poverty in any country is the greatest human rights challenge. One of the major goals of celebrating the human rights day is to eradicate the poverty from the life of human being and help them in getting the wellbeing life. Various other programs including music, drama, dance, fine art and etc. are held focusing to help people to learn their rights.

Most of the events held at this day are aimed to instruct people, children as well as teenagers about their human right. Some of the protest activities are also held in order to aware the people from areas where the human rights are unrecognized or disrespected.

Objectives of Human Rights Day

Human rights day is the worldwide observance celebrated by the people all across the world to get the real rights for the human beings. This day is celebrated to improve the physical, social, cultural and spiritual wellbeing and welfare of the vulnerable group of people globally. Some of the important reasons of why do we celebrate and objectives are:

- To promote the awareness about human rights among the people all around the world
- To emphasize the endeavors of the United Nations General Assembly in order to progress the overall human rights conditions.
- To get together and celebrate in cooperation to discuss and highlight the specific issues of the human rights.
- To encourage the vulnerable group of people like women, minorities, youth, poor, disabled person, indigenous people and etc. to take part in this event celebration and political decision-making.

Theme of Human Rights Day 2017 - #StandUp4HumanRights

Source: http://www.indiacelebrating.com

National Energy Conservation Day 14 Dec 2017

National energy conservation day is celebrated every year by the people all over the India on 14th of December. The Energy Conservation Act in India was executed by the Bureau of Energy Efficiency (BEE) in the year 2001. The Bureau of Energy Efficiency is a constitutional body which comes under Government of India and helps in the development of policies and strategies in order to reduce the energy use.

The Energy Conservation Act in India act aims to employ the professional, qualified and energetic managers as well as auditors who are with expertise in managing the energy, projects, policy analysis, finance or implementing the energy efficiency projects.

Objectives of National Energy Conservation Day

National energy conservation day is celebrated every year using particular theme of the year by keeping in mind some goals and objectives to make more effective all over the country among people. Some of the important goals are:

- It is celebrated to send the message of importance of conserving energy in the every walk of life among people.
- Promoting the way of process of energy conservation by organizing a lot of events such as discussions, conferences, debates, workshops, competitions and etc. all through the country.
- Promote people for less energy usage by neglecting the excessive and wasteful uses.
- Encourage people for efficient energy use in order to decrease the energy consumption and prevent the energy loss.

How National Energy Conservation Day is celebrated

To make the campaign of national energy conservation more effective and special all over the India, variety of energy conservation competitions are organized by the government or other organizations around the living areas of normal people as they are the main target of the campaign. At many places the various painting competitions on energy conservation day is held by the student or member of the organizations at school, state, regional or national level.

The campaign of the national energy conservation is the national awareness campaign launched by the Ministry of Power to facilitate the process of energy conservation in India. Painting competitions organized for the students at many levels is one of the main activities of this campaign which helps in increasing the awareness of children about the importance of conserving energy as well as educating and involving their parents in the campaign. This competition helps the people of domestic sectors to be aware.

Every participant is provided a theme Topic such as the “More stars, more savings”, “Today’s energy wastage is tomorrow’s energy shortage”, “Energy saved is future save” and many more. Participants can make their painting more effective by using the Pencil Color, Crayons, Water Color and etc.

Students, who take part in the competition and win, get participation certificate, merit certificate or cash prizes which worth Rs. 33,000 per State. This amount is distributed among all the winners of a state and awarded by the Ministry of Power at 14th of December at the celebration event of National Energy Conservation day.

Significant roles of Indian citizens in Energy Security

Each and every citizens of the India must aware about how to use efficient energy, how to save the energy for their own future safety and many more ways. They should follow all the rules, regulations and policies implemented by the Government of India in order to support the energy efficiency. Citizens of India can pay their direct contribution to the campaign of reduce energy use throughout the 11th Five Year Plan period. Children are the big expectation and hope for the country to bring positive changes as well as to enhance the economic condition of the country.

Source: http://www.indiacelebrating.com

Health Tips

Taking vitamin supplements may slow down the progression of a common eye disease

Latest evidence published in the Cochrane Library suggests that taking a multivitamin supplement that includes vitamin E, carotenoids (beta-carotene or lutein or zeaxanthin), vitamin C, and zinc may slow down the progression of the common eye disease age-related macular degeneration (AMD).

Age-related macular degeneration (AMD) is a progressive and sight-threatening disease affecting the central area of the retina and affects large numbers of people across the world. Population-based studies suggest that in older people (80 years and older), approximately one in three people have early signs of the disease.

There are numerous unanswered questions in the treatment of AMD. There has been a growing perception amongst eye care professionals that taking vitamin supplements and antioxidants, such as lutein and zeaxanthin, may protect patients against the progression of the eye disease.

A team of Cochrane researchers conducted a study to assess whether taking antioxidant vitamin and mineral supplements slows down the progression of AMD in people with a diagnosis of AMD. They collected and analyzed data from 19 studies involving men and women from Australia, China, Europe, and the USA.

Lead author Jenny Evans from the London School of Hygiene & Tropical Medicine explains more:

How important was it to update this Cochrane Review?
This is a topic that is currently of much interest to people with AMD. The review was last updated in 2012 and we knew that there were new studies available.

What did you find?
We found 19 studies that compared various types of vitamins against placebo in people with AMD. The evidence was mixed, but there was one large study in the USA that suggested that a particular combination of these vitamins may slow down the progression of the disease.

We did not find evidence that these supplements on their own were so useful.

What does this mean?
If you have a diagnosis of AMD, then vitamin supplements may be helpful.

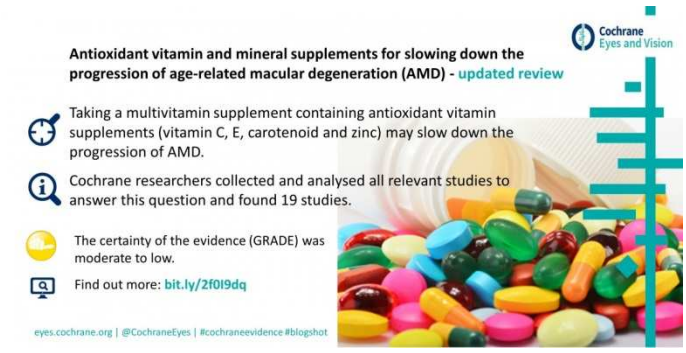
How robust is this evidence?
The evidence is not so robust. Most of the evidence comes from one large study from the USA which followed people up over six years. The other studies in the review were small and shorter duration and less conclusive.

What would your message be to eye care practitioners?
People with AMD may be interested in taking vitamin supplements. The benefits and harms should be explained clearly.

What would your message be to patients already taking vitamin supplements for AMD?
The decision as to whether or not to take vitamin supplements is up to you. You may wish to discuss these again at your next visit to your eye care practitioner.

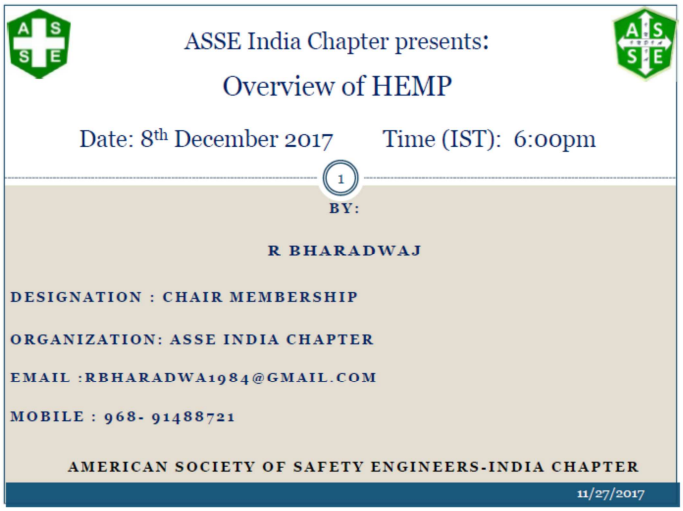
What does this mean for patients who think they are at higher risk of progression of the disease?
Vitamin supplements are generally regarded as safe. They may be helpful but your vision may deteriorate further, even if you take these supplements. Regular visits to your eye care practitioner are advised.

What further research would you like to see, and what would this tell us?
It would be good to have a large trial comparing a supplement containing vitamin C, E, lutein, zeaxanthin, and zinc with taking no supplement for people with AMD to see if this slows down progression to visual loss.



Source: www.cochrane.org

Forthcoming ASSE India Chapter's Webinar Information



Please register for **Overview of HEMP** on **Dec 08, 2017 5:45 PM IST** at:

https://attendee.gotowebinar.com/register/4689128307346486787

Overview of Hazard and Effect Management Process (HEMP) - HEMP is used as an element in the Health Safety and Environment Management System (HSE-MS) to address risk assessment. The HEMP methodology identifies various hazards at the facility and assesses management of the identified hazards.

After registering, you will receive a confirmation email containing information about joining the webinar.

HSE Quiz

1. Which of the following smoke detectors will detect most fires more rapidly than the other types?

A Reflect beam photoelectric
B Rate-of-rise thermal
C Ionizing
D Bulb detection system

2. A good safety design to overcome unexpected failures is the use of a:

A Safety margin
B Safety factor
C Maximum foreseeable failure margin
D Maximum permissible failure factor

3. The maximum exposure to impulsive noise should not exceed:

A 95 dB
B 105 dB
C 115 dB
D 140 dB

4. A megohm meter is used to:

A Measure large voltages
B Measure earth faults
C Measure large resistances
D Measure large currents

5. How many moles are in 75.0g of Oxygen gas? (The atomic weight of Oxygen atom is 16)

A 2.344 mol
B 4.687 mol
C 3.182 mol
D 1.562 mol

Watch out the next issue for correct answer

Answers from last issue's (October / 2017) Quiz: 1 (B); 2 (C); 3 (D); 4 (A); 5 (B)

You are welcome to send your inputs to: Sandip Mukherjee; e-mail: newsletter@india.asse.org; Phone: +91 9829600067

Selected articles shall be published in next publication

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