NEWS IN BRIEF

THE AIR WE BREATHE

Air pollution levels reached such alarming levels after the festival of Diwali in Delhi that schools had to be closed. At Anand Vihar (Delhi), the Delhi Pollution Control Committee's data showed that the concentration of $PM_{2.5}$ peaked at a whopping 883 µg/m^3 – that is more than 14 times the standard of 60 µg/m^3. At the same place, the PM_{10} was 1680 – 16 times the safe limit of 100 µg/m^3. Urban air pollution is predicted to be the top environmental cause of premature mortality worldwide by 2050. Thirteen of the 20 most polluted cities globally are in India, and the country has the world's highest rate of deaths caused by chronic respiratory diseases. Air pollution in India is estimated to kill 1.5 million people every year; it is the fifth largest killer in India. A study in 2015 revealed that the cost of air pollution-related illnesses and mortalities amounted to $0.5 trillion in India.

Air quality guidelines relate to four common air pollutants: particulate matter (PM), ozone (O_3), nitrogen dioxide (NO_2) and sulfur dioxide (SO_2).The WHO designates airborne particulates, a Group 1 carcinogen. The PM (inhalable coarse particles with a diameter between 2.5 µm and 10 µm, designated PM_{10} and $PM_{2.5}$) is the deadliest form of air pollution due to its ability to penetrate deep into the lungs and blood streams unfiltered, causing permanent DNA mutations, heart attacks, and premature death. WHO guideline limits for annual mean of $PM_{2.5}$ are 10 µg/$m^{3.}$ PM_{10} is primarily produced by mechanical processes such as construction activities, road dust re-suspension and wind, whereas the $PM_{2.5}$ originates primarily from combustion sources. An annual average concentration of 10 µg/m^3 was chosen as the long-term guideline value for $PM_{2.5}$ by the WHO. These findings suggest that the health risks associated with short-term exposures to PM_{10} produce an increase in mortality of around 0.5% for each 10 µg/m^3 increment in the daily concentration. Therefore, a PM_{10} concentration of 150 µg/m^3 would be expected to translate into roughly a 5% increase in daily mortality.

Children are more vulnerable to air pollution because of their developing lungs. The number of alveoli increase from 24 million at birth to 257 million by 4 years. They breathe 50% more air per kg body weight. Studies from Poland have shown that an increase of 10 µg/m^3 in PM_{10} exposure was associated with a decrease in growth of FEV_1 of 84 mL/year. Besides the increased acute episodes of wheezing and respiratory infections, there is evidence of increased fetal loss, preterm deliveries and intrauterine growth retardation in prenatal exposure to air pollutants. In the great smog in 1952 in London, the infant mortality doubled.

The emergency in Delhi is a clarion call to all Indians to clean up the air in their cities.

(*The Hindu 31 October 2016, Economic & Political Weekly 8 October 2016*)

WHO GUIDELINES FOR PREVENTION OF SURGICAL SITE INFECTIONS

The WHO guidelines for the prevention of surgical site infections includes 29 recommendations by 20 of the world's leading experts. In low- and middle-income countries, 11% of patients who undergo surgery get infected, and up to 20% of African women who have a caesarean section contract a wound infection. In the United States, they contribute to patients spending more than 400 000 extra days in hospital at a cost of an additional 900 million USD per year. A pilot study in four African countries showed that implementing a selection of the new recommendations could result in a 39% reduction in surgical site infections.

The guidelines include 13 recommendations for the period before surgery, and 16 for preventing infections during and after surgery. Many of the guidelines are simple and easily implementable. It is recommended for patients to have a bath or shower prior to surgery. Patients with known carriage of nasal *S. aureus* must receive perioperative intranasal application of mupirocin 2% ointment. Standard antibiotic prophylaxis must be administered within 120 minutes prior to surgical incision but must *not* be continued after surgery. Shaving or hair removal prior to surgery is *not* recommended while surgical site skin preparation must be done with antiseptic solutions. Immunosuppressive medications must not be discontinued prior to surgery.

An ounce of prevention is worth pounds of treatment. (*http://www.who.int/gpsc/global-guidelines-web.pdf*)

FIGHTING THE ZIKA VIRUS

An innovative experiment is being carried out in two South American cities to fight the spread of the Zika virus. Mosquitoes infected with the *Wolbachia* bacteria are to be released in large quantities in Rio De Janeiro in Brazil and Medellin in Colombia. These bacteria spread rapidly in the Aedes mosquito, and has the strange property of hindering the fertility of the host and rendering their offspring infertile. It also blocks the replication of the Zika and Chikungunya virus in the mosquito, and may also limit the spread of the Dengue virus. Experiments in Australia, Vietnam and Indonesia have found some measure of success. If successful, it will be a game changer in vector control and is being dubbed the biggest thing after DDT. (*Nature 26 October 2016*).

Gouri Rao Passi
gouripassi@hotmail.com