

Editorial:

Wake-up call:

We Vow this Earth to Our Children, It is Time to Act!

Dr. Nimain Mohanty

Respiratory problems in children are steadily increasing all over the world. Every 4th child is having cough or wheezing, particularly in winter months. All over world, 8% of children are having chronic cough¹. 50% of them suffer from Asthma, which is a serious health problem world wide, affecting all age groups. Its prevalence is increasing day by day, particularly among children². While prevalence of asthma among children in India was 4% in 2000, It stand at 11.6% now. It should be a matter of greater concern to all, the public, policy planners and of course, the Governments. It has been reported that 2 Indians are dying every minutes related to environmental pollution!

We are helplessly watching the fast worsening pollution and constant rise in the environmental temperature. There is a forecast that it could rise another 2°C to touch 50°C at most places is frightening. China, India, many more parts of the Asia, West-Asian and South-east Asia are already choked with high levels of suspended particulate matter. We are still complacent, wishing away the worst to come. No urgency is shown at any quarter. With increase in purchasing power of people in the market driven economy, about 300 to 500 new vehicles in an average are being added to each of our metro cities every day! The judicial 'Activism' to control pollution by disallowing sale of Bharat-III or less compliant vehicles in limited areas is a miniscule but belated step in the right direction. Even this is not without hue and cry of the public and the industry alike. Rather the Government should have pro-actively come out with stringent measures, covering the entire country. The public should co-operate wholeheartedly to such measures. Populist solutions like odd-even arrangements are not only adhocism, but

also irrational. The senseless and unplanned mushrooming of real estate, creating concrete jungles all over, is bound to lead us to doom's days. Contrary to norms, no proportionate green cover is insisted upon. We prefer to rather close our eyes towards polluting industries all over. Surprisingly we the third world countries demand financial subsidies to curb such polluting sources in our own benefit to sign agreements on climate change. This is something like certain terrorist sponsoring country demanding funds from USA to curb terrorism in its own soil! Use of old tractors for transport in rural areas and diesel pumps guzzling out harmful hydrocarbons, poisonous gases need to be curbed with voluntary public cooperation through education and serious awareness campaigns in a continuous manner. The recent trend of burning leftover straw post-harvest all over in north India, traditional Jhoom cultivation by burning forest land in the tribal belt of eastern and north-eastern region seem going out of hand and causing irreparable damage to human health.

A study entitled, 'The Lancet Countdown: Tracking Progress on Health and Climate Change' was published recently in Lancet³. It reported that an estimated 18,000 people die every day in the world due to environmental and household air pollution, making it the world's largest single environmental health risk. Air pollution is not only important for urban area, but also affects rural area. About 80% of people living in urban areas around the world are exposed to air pollution levels in excess of WHO guidelines. This number rises to 98% for urban populations in low and middle-income countries.

Air pollution has been under spotlight for

quite some time now. Air quality in Delhi, has often been in the 'poor' or 'very poor' category since Diwali 2016. Environmental pollution adds to disease burden globally, both in morbidity and mortality. Higher air pollution has been implicated for several diseases, including respiratory, diabetes and heart disease.

Air Quality Index³ (AQI) takes into account eight air pollutants: PM10, PM2.5, nitrogen dioxide (NO₂), sulphur dioxide (SO₂), Ozone (O₃), Lead (Pb), Ammonia (NH₃), carbon monoxide (CO). There are six AQI categories: Good (0-50), Satisfactory (51-100), Moderately polluted (101-200), Poor (201-300), Very Poor (301-400) and Severe (401-500).

A recent report^{4,5} called 'State of Global Air 2017' released by the Health Effects Institute (HEI) and Institute for Health Metrics and Evaluation (IHME) stated that 92% of the world's population lives in areas with unhealthy air. Long-term exposure to fine particulate matter, the most significant element of air pollution, contributed to 4.2 million premature deaths and to a loss of 103 million healthy years of life in 2015. This makes air pollution the 5th highest cause of death among all health risks, including smoking, diet, and high blood pressure.

It has been reported that Ozone-related premature mortality is highest in India.

India along with China accounted for more than half of the total global attributable deaths. This report also highlighted ozone-related mortality. Globally there was a 60% increase in ozone-attributable deaths, with a striking 67% of this increase occurring in India. An estimated 2,54,000 deaths were attributable to Ozone exposure and its impact on chronic lung disease. India recorded the highest number of premature deaths due to ozone pollution (107,800), 13 times higher than Bangladesh (7900) and 21 times higher than Pakistan (5000). The report quantified air pollution using two main pollutants: PM2.5 and ozone. Surface or ground ozone is harmful, unlike the ozone layer high up in the atmosphere, which acts

as a shield and protects from harmful UV rays. Ground Ozone is formed by the reaction of pollutants in the vehicular and industrial emissions with sunlight. Nitrogen oxides (NO_x) and volatile organic compounds (VOC) are nothing but Ozone precursors. Traffic emissions constitute more than 50% of the Ozone precursors. The Ozone levels were rather found higher in rural areas as compared to the urban. Because the levels of NO_x are lower in rural areas. Cities have a higher NO_x levels due to traffic, which neutralize ozone and keep it in or near permissible limits. Levels of PM2.5 are higher in cities. Ozone is associated with respiratory disease independent of exposure to PM2.5.

A recent study published in 'The Lancet,' states that in every minute 2 people are killed in India due to air pollution related causes. Several Indian cities have alarmingly high toxicity levels every day, qualifying as the worst polluted cities across the world. Based on 2010 data compiled by 48 scientists, the study shows that 2.7 to 3.4 million preterm births globally could be linked with PM exposure of 2.5. Of this, South Asia comprises 1.6 million of the preterm births. New Delhi and Patna were evaluated in the study as most polluted cities in the world. Even when concentration of pollution falls within WHO prescribed limits, the study shows that adverse health effects can still take place, although reduction in pollution levels can be helpful.

Several professional bodies in United States, through a warning called 'Medical Alert! Climate Change is Harming Our Health', have alerted the public, policy makers, doctors, business houses and political leaders in order to sensitize them about the extent of damage climate change has been doing on health and what exactly is required to be done for human protection. Broadly, three types of hazards have been spelt out:

1. Direct harms e.g. injuries and deaths due to increasingly violent weather, asthma and other lung diseases that are exacerbated by extremely hot weather, wildfires and longer allergy seasons.

2. Spread of disease through insects that carry infections like Lyme disease or Zika virus, and through contaminated food and water.
3. The effects on mental health resulting from the damage climate change can do to society, such as increasing depression and anxiety.

In India, the extrapolated list can be unending; starting from Asthma, tuberculosis, chronic bronchitis, cancer, diarrhoeal diseases, typhoid, malaria, Dengue and so on. Lack of education, selfishness, complacency all add to the problems. Paediatricians being trusted community leaders and ambassador of children must come forward to show the way and lead the country from the front. Smaller things do make great impacts. Let the charity start from home. These are 12 self-directed commandments for pediatricians, wherever we are:

1. Let's counsel all parents & children visiting our clinics on environmental pollution. Voluntarily take at least one session in a nearby school.
2. Insist on not burning the biomass for cooking and heat generation
3. Advise against sweeping the floor of rooms where an asthmatic child lives. Better advise to use mopping or vacuum instead.
4. A concerted movement against fire-crackers, incense sticks, insecticide repellants are over due. Instead, insist on using impregnated bed-nets.
5. Minimum 10 plantations in a year by each child, maintained by parents.
6. Cycling by the grown up to school and ensuring through parents that all school buses must be Bharat-IV compliant.
7. Active campaign against alcohol, tobacco of any form, whether in public or at home,

including passive and 3rd person smoking. Posters in schools

8. Campaign against burning harvest wastes in the field and dung cakes. Make use these stuff for organic manure instead.
9. Nurturing the forest cover around us, including social forestry and the mangroves in coastal areas. No cooking inside jungles while on picnics.
10. Teaching 'Cough etiquettes' to all without any hesitation or reservation.
11. Hand washing habits inculcated among all family members and techniques demonstrated.
12. Use of safety latrines; drinking safe and wholesome water (atleast boiled for 20 minutes before consumption)

References:

1. Chang B et al. Multicentric study: Chronic Cough in children and its outcome. *Chest* 2006; 129: 132-41
2. Global Strategy for Asthma Management (GINA guidelines), 2015
3. Aaron J Cohen, Michael Brauer, Richard Burnett, H Ross Anderson, Joseph Frostad, Kara Estep, Kalpana Balakrishnan et al. Estimates and 25-year trends of the global burden of disease attributable to ambient air pollution: an analysis from Global Burden of Diseases Study (1990-2015). *www.thelancet.com*, April 10, 2017; [http://dx.doi.org/10.1016/S0140-6736\(17\)30505-6](http://dx.doi.org/10.1016/S0140-6736(17)30505-6)
4. *WIREs Clim Change* 2011, 2:902–918. doi: 10.1002/wcc.1385.
5. Climate change. *www.eurekalert.org*, March 15, 2017