

# **Summary of Conference**

## **Environmental Exposure and Preventive Health care**

### **3rd February, 2017 at IIT Delhi**

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International conference on "Environmental exposure and preventive health care" was organized by IPCA in collaboration with IIT Delhi and supported by IDS and University of Wisconsin-Whitewater USA on 3<sup>rd</sup> February, 2017 at IIT Delhi with the objective to discuss on the adverse impact and challenges of environmental pollution on different sectors of the society and develop a strategy to prevent pollution induced diseases, improve the health quality of people and promote preventive health care tool to combat the increasing effect of pollution in the environment. To discuss with this problem representatives and dignitaries from United Nations International Children's Fund (UNICEF), University of Wisconsin-Whitewater, USA, IIT Delhi, JNU, Lady Irving College, Bharati College, University of Delhi, Indian Institute of Public Administration(IIPA), CSIR-NEERI, Amity University, Noida, University College of Medical Science, Lok Nayak Hospital, Sodhna Charitable Trust, Gravis, Chintan, Citizens Environment Improvement Society(CEIS), Sonalika tractors, Honeywell, teachers and principals of different schools in Delhi NCR region, presidents and members of Residents Welfare Association (RWA), senior citizen association congregated together at one platform in this conference.

The following concerns and suggestion related to different aspects of environmental pollution, and preventive healthcare emerged during the workshop

### **CONCERNS AND ISSUES**

#### **Pollution-related health impacts**

- There is a relation between the burden of diseases and the kind of environmental pollution
- In India, there is paucity of data related to environmental impact and healthcare and inconsistency in study design.
- New emerging diseases are coming up.
- Injudicious use of antibiotics by medical practitioners has increased as the resistance against these antibiotics due to the increasing biodiversity.
- Projections indicate that about 3.5 million people will die prematurely each year over the next 20 years as a result of pollution
- There is an urgent need for environment revolution
- Triangulation of health and exposure data is lacking
- For India, the burden of ill health caused by pollution is equal to a loss of life of more than 1.5 years

#### **Air Pollution & health impacts**

- Air pollution is the world's biggest environmental risk to health.
- India ranks top ten of the most polluted countries.
- Ten of the top twenty most polluted cities around the world are in India in terms of the highest annual levels of Particulate Matter (PM<sub>2.5</sub>).

- Outdoor air pollution is the fifth and indoor air pollution is the second largest killer in India, which accounts for 9% of the national disease burden in India and 28% of all deaths due to indoor air pollution in low and middle-income countries.
- The total burden of diseases from the air pollution amount to almost 100 million DALYs per year equivalent to a loss of slightly more than one year of life over the life span of an average individual.
- Construction, burning of leaves, vehicular pollution is the main causative of diseases related to pollution. Most of the diseases are related to dust pollution.

#### Aerosols and other pollutants

- Aerosols are one of the air pollutants with major concerns.
- Only circumstantial evidence is found in aerosol contamination.
- Aerosol inhalation affects the Heart-Rate Variability (HRV).
- Higher the Ultrafine Particles (UFP) concentration, Higher is the HRV Risk.
- Indians are more prone to Cardiovascular Diseases (CVDs) caused by aerosol pollution than the other ethnic groups due to smaller coronary arteries. Due to consistently high aerosol concentration in Delhi, people are more susceptible to Medium to HRV and other CVD.

#### Silicosis

- Silico-tuberculosis is a certified National occupational health hazard. It is an occupational lung disease, found amongst the workers of sandstone mines in the state of Rajasthan. It is a chronic obstructive lung disease whose treatment is more complex.
- Silicosis is a dust-borne disease that causes irreversible and fatal changes in the lung tissue. Tuberculosis is infectious and caused by *mycobacterium tuberculosis*, which is highly communicable. Both silicosis and tuberculosis are life-threatening diseases.
- Silicosis is preventable but not curable. While Tuberculosis (TB) can be treated completely with adequate medication, silicosis can only be provided palliative support. Mineworkers suffering with either of these diseases, have a great risk of developing the other disease. Co-existence of silicosis and tuberculosis is known as silico-tuberculosis, prevalence of which is high in stone mines of Rajasthan. Silico-tuberculosis over the years has affected mining community profoundly causing significant social and economic loss. Combating silicosis is a long journey other organizations are also working on the ground level.

#### Major issues related to silicosis

- Sandstone mines at Rajasthan are unregulated and unprotected.
- Patients with silicosis wrongly diagnosed as tuberculosis.
- There hasn't been any change in the mindset of the people though guidelines are available but the attitudes have not yet changed.
- Silicosis is a chronic disease which takes 20-30 years to develop.
- Clinical doctors are more interested for curative treatment rather than exploring the history of the patients for assessing the relationship between pollution and the ailment.

#### Air pollution and diseases in Children

- 5.5 million people worldwide, including 1.4 million in India die prematurely due to Particulate matter (PM).
- In India, indoor and outdoor air pollution, each account for half the premature deaths.

- A study conducted by Arunodaya School, Delhi has revealed that 74% of children use masks and 50% of them complained of having breathing problems.
- Children are worst affected by environment pollution.
- Major cause of death in children less than 5 years due to diseases caused or exacerbated by indoor as well as outdoor air pollution infant mortality.

### **Water pollution and health impacts**

- Scarcity of water leading to increase in water borne diseases
- Water borne diseases classified into: water washed diseases, water scarce diseases, water based disease and vector borne diseases
- Unhygienic leaving conditions further contaminate the water resources which in turn contaminate the food resources and cause diarrhea.
- Globally 1.1 million people lack access to safe drinking water, while 2.6 million people lack proper sanitation
- Water related diseases are main concern in India. Five main water borne diseases in India are cholera, hepatitis A&B, thyphoid, filariasis and dysentery.
- Diarrhea increases by 8% for each 1°C increase in temperature
- 88% of the diarrheal disease is due to unsafe water inadequate sanitation and hygiene.
- Populations at risk are Poor, Children and elderly residents.

#### *Major issues related to water borne disease*

- High rate of chromium has completely degraded the water quality of Yamuna River making it yellow in color.
- Use of polluted water for irrigation has increased the rate of contamination in rice eg arsenic contamination of rice.
- There is gap between water supply and sanitation. Sanitation has always being overlooked which resulted in increase of water has borne diseases.
- In river cleaning programs conventional approach is being used. Nano particles which are the main concerns are ignored.

#### Water borne diseases in children

- Every 90 seconds a child dies of water related diseases.
- 1 in 200 children dies from diarrhea worldwide.
- 90% of the deaths caused by diarrhea is of children <5 and 80% of them are of children below 2
- 95% of the diarrhea deaths in children <5 could be prevented with proper sanitation upgrade and provision of safe water supply.

### **Health problems in a rural sector**

- In a rural sector, the dependency on RMPs, corrupted referral systems and lack of certification has increased the rate of untreated diseases and high cost on medical treatment.
- In rural sector orthopedic problems, high blood pressure, anemias are the commonly occurring problems diagnosed.

## Climate Change and Health

- According to WHO, the five leading environmental health risks are unsafe water, sanitation hygiene, indoor smoke from solid fuels, lead exposure, urban outdoor air pollution and global climate change.
- Climate change causes a significant burden in developing countries
- Unmitigated climate change is likely to cause significant public health impacts on the future
- There is a complete linkage between daily temperature and diurnal admissions.
- The Potential health impacts of climate change
  - i. Extreme weather events: Temperature, Floods
  - ii. Vector-borne diseases
  - iii. Diseases related to air pollution
  - iv. Diarrhea diseases
- Climate Change causes changes in variance, as well as changes in mean temperatures
- Increased temperature and humidity would result in Survival/ replication of pathogens in the environment resulting in aggravation of the contamination of the water sources and spread of diarrhea diseases.
- Microclimatic change can affect the diseases' occurrence and intensity.
- Extreme weather events results in an outbreak of diseases like malaria borne, rodent borne, water borne and non infectious diseases.
- Risk of water borne diseases increases with temperature change

## RECOMMENDATION & WAY FORWARD

In-order to combat & mitigate the concerns and issues highlighted above the following intervention at the three levels Research, Technological and Policies were recommended in the conference

S.No	Intervention	Recommendation
1)	Research	<ul style="list-style-type: none"> <li>• There is a need for action research on various issues pertaining to environmental pollution and healthcare and developing authentic set of baseline data in India.</li> <li>• Technical Institutes should develop mathematical models to set up group of cohort studies to establish links between risk factors and health outcomes.</li> <li>• Composite multi-sector projects measuring ambient air pollution, personal exposure and its health impact assessment should be done.</li> <li>• Research on the impact of location, surroundings, workplace, type of pollutants exposed and various other factors need to be studied.</li> <li>• Data accessibility of environment and health is a real challenge. Efforts should be made to ensure that the data are accessible to all the stakeholders involved.</li> <li>• Research should be done to explore the affectivity of plants for pollution control.</li> <li>• Research should be conducted for developing methods for assessing the data related to environment and health.</li> </ul>

		<ul style="list-style-type: none"> <li>• NEXUS (Near Road Exposures and effects of urban air pollutant study) as conducted by EPA USA should be replicated in India to understand traffic-related air pollutants and its adverse health outcomes.</li> <li>• There is a need to conduct studies on different environmental exposures to develop comprehensive data of exposure.</li> <li>• In chronic respiratory illness gene environment, interaction is very important. Susceptibility of a disease is based upon the gene configuration of the body. Research on gene environment interaction is very important to understand the symptomatic response of individuals towards the pollutants.</li> <li>• Method and tools are needed for estimating the current distribution and burden of climate-sensitive diseases; future health impacts attributable to climate change, identifying current and future adaptation options to reduce the burden of disease.</li> <li>• Micro level studies for establishing dose response relationship between the patients and drug administered needs to be conducted.</li> <li>• In the current scenario, the a need of the hour is to conduct research on bio-methanation of faecal bodies.</li> <li>• Establish surveillance units for pollution as well as respiratory diseases in designated areas</li> <li>• Micro level studies for establishing dose response relationship.</li> <li>• Composite multi-sector projects measuring ambient air pollution, personal exposure assessment and its health impact assessment.</li> </ul> <p><i>Awareness generation of children</i></p> <ul style="list-style-type: none"> <li>• Young minds can be harnessed easily so awareness generation programs should be conducted to make them aware about carbon /energy foot prints.</li> <li>• Schools should be encouraged to spread awareness through science exhibition and organizing poster, painting and other competitions.</li> </ul>
2)	Technological	<ul style="list-style-type: none"> <li>• Emphasis should be on developing and using innovative technology to save the environment.</li> <li>• There is a need for technological intervention for reducing the direct exposure to the workers in hazardous works.</li> <li>• Cost effective alternatives of plastics should be developed though cellulose plastics made of potato cellulose has also come up but due to its cost, it could not be implemented in ground.</li> <li>• Bio- CNG/ Biogas is a very cost effective and environmental friendly replacement of LPG or CNG.</li> <li>• IIT has developed such a technology to generate 1 Megawatt energy from 1200 tones of rice straw which is utilized for biogas production.</li> <li>• The water-scrubbing-based biogas upgrade and compression/bottling system developed at the campus is now patented with IIT-D, promising</li> </ul>

		<p>a green and low cost fuel for automobiles and cooking</p> <ul style="list-style-type: none"> <li>• Biogas is bottled into CNG cylinders for automotive applications, and its testing on engine's performance and emissions has revealed that the mileage of biogas run Wagon R car is more than 24 km/kg.</li> </ul>
3)	Policy	<ul style="list-style-type: none"> <li>• Need for interdependence and mutual support of all the concerned departments for achieving sustainable development goals.</li> <li>• There is an urgent need to review and amend the existing health care and environment policy and develop new integrated policy having a holistic approach.</li> <li>• There is a close linkage between environment, public health and poverty. So there is a need of integrated and coordinated effort of all the departments working on concerned issues.</li> <li>• There is need for prophesying against the use of polythene bags, measure should be developed for combating it. There should be a strict ban on its usage.</li> <li>• There is a need to develop strategy to promote sustainable development in the long run, environment conservation and environmental health governance should be incorporated into national developmental plans in a complimentary and integrated way.</li> <li>• Linkage between Environmental Health and Sustainable development needs to be strengthened. A multi pronged collective approach needs to be adopted targeting different groups and stakeholders involved.</li> <li>• Policy decisions should be participatory in consultation with all the stakeholders involved.</li> <li>• Need for enabling intersectional coordination towards public health Issues</li> <li>• There is a need for adopting a multilateral, multi-ministry approach.</li> <li>• MoEFCC should work for reducing environmental exposure as well as for prevention and cure.</li> <li>• Subsidies are leading to further environmental degradation</li> <li>• Improvement in morbidity and mortality can be achieved through sanitation and proper water treatment policies and regulations.</li> <li>• Entire water bodies cannot be designated into classes. In order to clean the water bodies, there is a need for proper classification instead of designating the entire water body into classes.</li> <li>• Drinking water standards should be integrated.</li> <li>• There is a need for developing transparent system of water surveillance.</li> <li>• Policy and regulation should be developed for C&amp; D waste recycling.</li> </ul>

## **Developing and replication of successful healthcare models developed by States & organizations**

### **Multi-sector Approach**

- State of Kerala has adopted multi-sector approach with preventive health care package these kinds of initiatives should be studied and replicated in other parts of the country.

### **Imbedded Approach**

- In order to reduce the total cost of healthcare system group formation is very important is SHG are vital to reduce the total cost of health care and protecting communities from diseases. These SHGs should not be focused only on single disease or community. The cost effective structure is different in different groups. Interventions should be dynamic and of reflective to the environment. Imbedded approach needs to be adopted for much more effective delivery, even when budgets are reduced dramatically; the continuous or imbedded basis continues to deliver services. This approach has been adopted by NGOs like Sodhana Charitable trust and GRAVIS.

### **Preventive Vs Treatment Concept**

- Sodhana charitable trust developed a model based on the concept "Prevention vs. Treatment" in 9 villages of Andhra Pradesh in which health care workers appointed by the trust conduct awareness generation programs to the 40 SHGs formed in 9 villages. In this program, program emphasis is on disease identification within the village, awareness generation.

### **Occupational Health Safety**

- Gravis is doing community health program for the sandstone mine workers. Under this program, it conducted a qualitative study on prevalence of silicosis in the sandstone mines of Rajasthan for prevention of not only silico-tuberculosis but also reduce the sufferings of mine works & their family members. GRAVIS program provides diagnostic and curative medical services to the sand stone workers and organizes awareness trainings for workers, employers, medical professionals and government agencies. GRAVIS also advocates for the occupational health safety of mineworkers in Rajasthan