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Impact on Health due to Air Pollution: a case study of Jalgaon City

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Abstract:

According to an estimate out of total air born disease patients, 80% are in India. The problem spans over the whole world, from developed countries to the developing countries. Air pollution in cities causes a shorter lifespan for residents, especially to the child. Developing countries have reported a significantly high mortality rate due to air pollution. Assessment of dynamics of air born diseases is necessary to understand the scenario of air pollution and consequently to adopt appropriate control measures.

The present work is a case study for city of Jalgaon 21.0077° N, 75.5626° E. NH 6 (AH 47) passes through the city of Jalgaon. It has a very high traffic density, resulting into high level of air pollution all around. The impact of air pollution is quantified by surveying the hospitals of Jalgaon city and interviewing the doctors. A rising pattern in the number of patients suffering due to air pollution is being observed. It is a matter of serious concern and needs immediate attention.

Key words:

Air pollution, air born diseases, health impact.

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1. Introduction

Clean air is bliss of nature. However, it has become scarce now a days. One can refuse to drink the water or refuse to eat the meals if seems to be unpalatable. However, no one can refuse to breathe however polluted the air may be. We breathe 16 times a minute and ingest 21000 L air per day. Air pollution in cities causes a shorter lifespan for residents, specially to the child. Developing countries have reported a significantly high *mortality rate due to air pollution.* Studies done by following researchers have reported very poor quality of

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air in different parts of the world: Krześlak & Korytkowski (1994) in Polland, Avdeev & Korchagin (1994), in Ukraine, Pacahuri *et al* (1998), Kan (2009) in China, and Khan (2010) in Pakistan. Polluted air contains substances that creates a hazardous to general health (Health and Energy, 2007). The major pollutants found in the air we breathe include particulate matter, PAN, lead, ozone, heavy metals, sulphur dioxide, benzene, CO and NO_x (European Public Health Alliance, 2009).

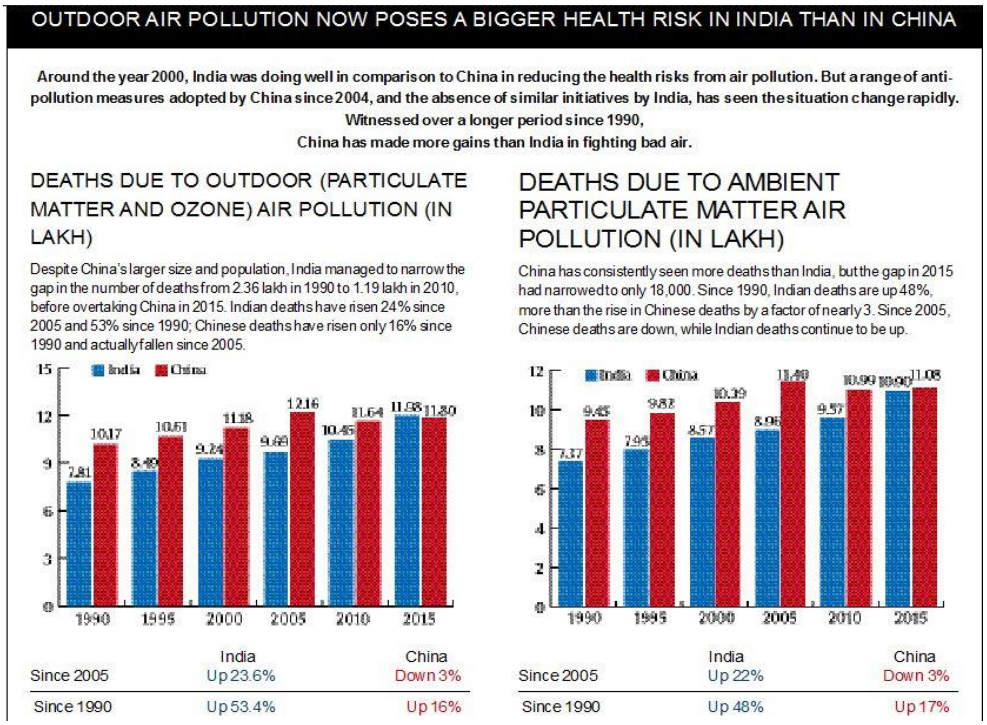

Fig 1: Statistics of deaths due to air pollution.

Source: http://cpcb.nic.in/upload/NewItems/NewItem_188_Epidemiological_study_AP_Report.pdf

Health hazards of air pollutants:

The health hazards due to common air pollutants are described as follows (EPHA 2009):

- Reduced lung function
- Respiratory symptoms- coughing and shortness of breath
- Aggravation of various lung diseases like asthma etc.
- Variety of allergies
- Premature mortality.

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- Damage to the developing nervous system causing IQ loss and impacts on learning ability and memory, especially in children.
- Cardiovascular and renal effects in adults.
- Early effects related to anemia.
- *W*heezing
- Chest tightness
- Eye and skin irritation
- Hair fall
- Hindrance of oxygen reaching the body's organs and tissues
- Aggravation of heart disease
- Unconsciousness.
- Cancer
- Liver, kidney, and brain damages

The most affected group:

The effect of air pollution is a function of concentration of air pollution, time of exposure, health status of the recipient and age group. Generally children are considered to be the most affected group due to their developing immune system.

Experimentation

Hospitals in Jalgaon:[16]

Jalgaon city enjoys the status of educational and medical hub of the region. It has so many specialized hospitals which are referred by nearby hospitals. It has a district hospital as well as several private hospitals. A list of major hospitals in the city is given as below:

- Civil Hospital Jalgaon
- Arogyadeep Hospital
- Asha Maternity Clinic
- Dr Ramkant Patil Health Care Center
- Jalgaon Neurologist and Trauma Center
- Khadke Accident Hospital
- Malti Accedient Hospital
- Meera Hospital

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- Nimjai Health Care Center
- Sahyog Critical Care Center
- Saraswati Hospital
- Sheetal Hospital
- Siddhesh Hospital
- Siddhivinayak Hospital
- Sukut Hospital
- Vishvanath Health Care
- Vedant Hospital
- Arogya Niketan
- Kamal Helath Care
- Dr R K Chaudhuri Hospital
- Padmavati Hospital
- Varad Hospital
- Ganapatti Hospital and Health Care Center
- Gajre Hospital
- Godavari Clinic
- Gayatri Urology and Surgical Hospital
- Vivekanand Hospital
- Gajanan Heart Clinic

Hospital Selection:

In the present study, seven hospitals out of the list given above are selected. They include: Civil Hospital Jalgaon, Ganapati Hospital and Health Care Center, Varad Hospital, Siddhivinayak Hospital, Arogyadeep Hospital, Padmawati Hospital and Sukrut Hospital. All these are the major hospitals of the city having multi-specialization health care facility.

Data collection

We discussed with the Hospital In-charge of these hospitals. We had discussions with them and they provided us data pertaining to the number of patients reporting with air pollution born diseases in their hospitals. The doctors had been kindly cooperative, yet provided information on the condition of confidentiality. They mentioned a practical limitation associated with the data that the patient reporting for a particular disease

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may have the same due to a variety of reasons, and due to the combination of reasons. The physical health and personal habits also play important role in the overall well being of the patient. The authors have ensured the hospitals that specific names of the patients or data of specific hospital with name shall not be disclosed in any publication.

Results and discussions:

Doctors have provided us data from 2013 to 2016 for the number of patients reporting air pollution born diseases in their hospitals. The cumulative data of hospitals is being shown in Fig 2. The results are not indicated as absolute numbers rather they are indicated as the percentage of the total number of patients reporting the hospital.

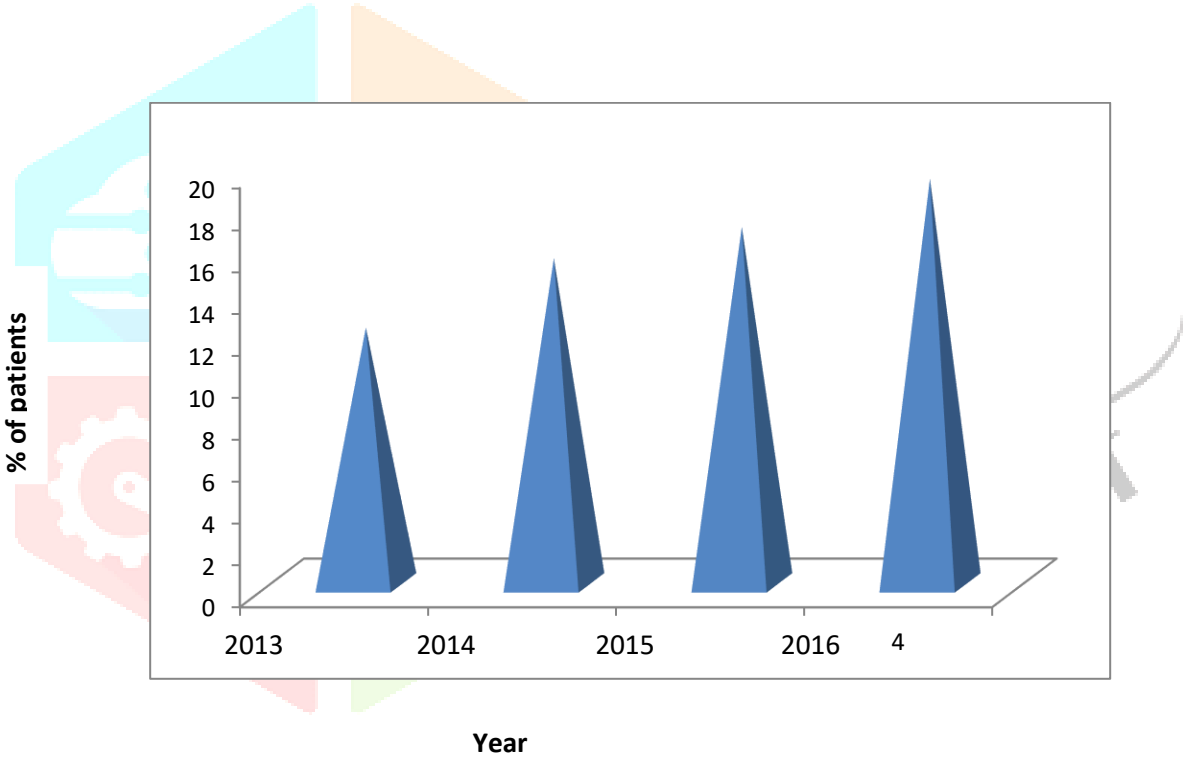

Fig 2: Percentage of patients of air pollution born disease in Hospitals of Jalgaon.

Out of the various air pollution born diseases (or disorders), the maximum rise is observed in asthma and bronchitis patients. Figs 3 – 4 show the percentage of asthma and bronchitis patients in 2013 to 2016.

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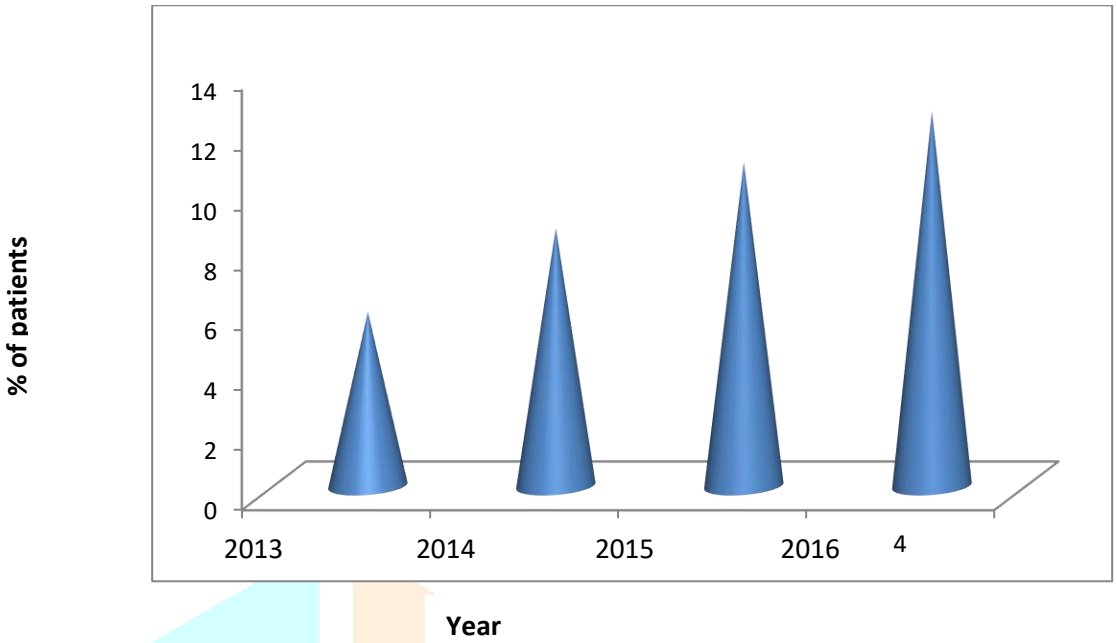

Fig 3: Percentage of patients of asthma in Hospitals of Jalgaon.

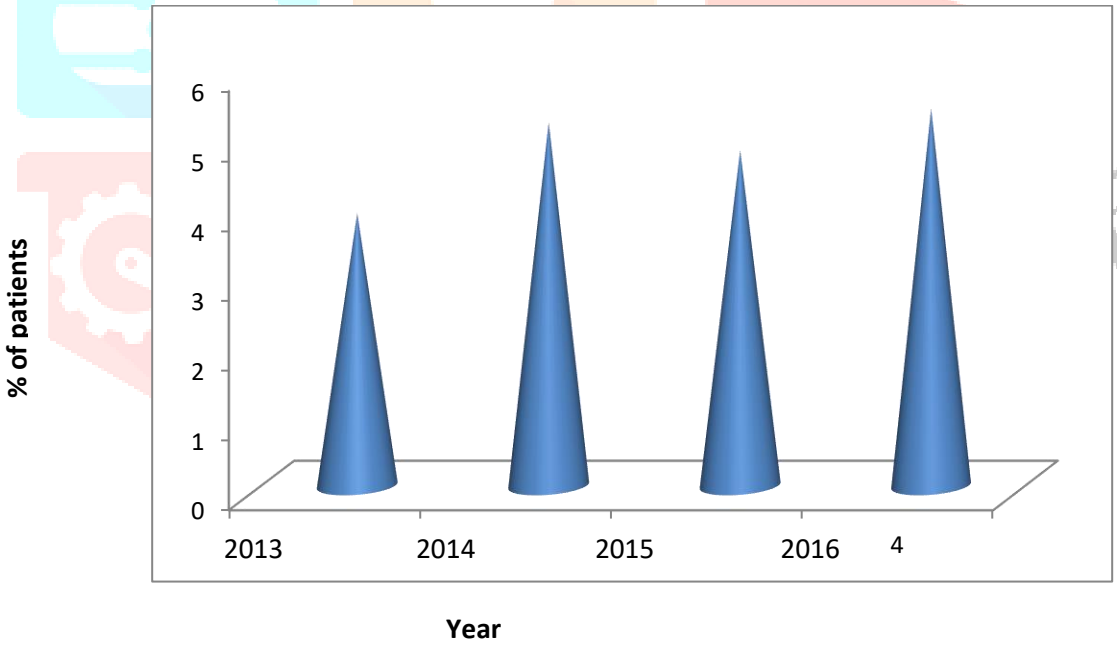

Fig 4: Percentage of patients of bronchitis in Hospitals of Jalgaon.

The figures 2 - 4 explicitly show that the air pollution born diseases in the city of Jalgaon are significantly increasing. This is an issue that requires immediate attention of authorities.

Conclusions:

The air pollution born diseases in Jalgaon city are increasing at alarming rate. It has been observed that the total number of patients reporting hospitals due to air pollution born diseases have increased from 13% to 20% in just a span of three years. Asthma and bronchitis are found to be the most important diseases in Jalgaon city. The patients of asthma have dramatically increased from 7% to 14% in just 3 years. The increase in bronchitis patients is around 2% (from 3% to 5%) in the study period. In fact this mild growth may be attributed to the population rise and increasing awareness amongst masses about health care also.

Anyhow, air pollution born diseases in Jalgaon is a issue of grave concern and needs due consideration.

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