



**HELP DELHI**  
**BREATHE**

- ➡ 13 of top 20 cities - Indian
- ➡ Delhi # 1
- ➡ Top 4 cities - Indian

# Delhi world's **most** polluted city

**TOXIC** India slips to 155 among 178 countries on environment performance index, Capital pips Beijing to be city with dirtiest air

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**NEW DELHI:** It's no surprise that pollution is a perpetual problem in India. But it's definitely disheartening to hear that India has slipped 32 ranks in the global Environment Performance Index (EPI) 2014 to rank a lowly 155 and its capital Delhi has earned the dubious title of being the world's most polluted city.

A comparative study of 178 countries on nine environmental parameters released earlier this month by the US-based Yale University shows that one

and water resources. India's performance lags most notably in the protection of human health from environmental hazards," said a statement issued by Yale.

The study described India's air pollution as the worst in the world, tying with China in terms of the proportion of population exposed to average air pollution levels exceeding World Health Organisation (WHO) thresholds.

A deeper look at the data gathered by a Nasir scientist showed that Delhi had the highest particulate matter (PM) 2.5 pollution levels followed by Beijing, Delhi, with 80 million registered vehicles

health implications. And while Beijing's infamous smog has begged headlines and prompted government action, even led to the announcement of rewards for cutting back on pollution, the dangers in Delhi have been largely ignored.

According to a study by the Harvard International Review, every two in five persons in Delhi suffer from respiratory ailments. The Lancet's Global Health Burden 2013 report termed air pollution the sixth biggest human killer in India. The WHO last year termed air pollution carcinogenic.

## CAPITAL BREATHES UNEASY

Tops global cities with worst air pollution



1

NEW DELHI, INDIA

### INDIA SLIPS IN RANK TOO

Is second-most polluted among its neighbours

	2014	2013
Bangladesh	149	159
India	155	123
Pakistan	140	125
Nepal	139	31
China	116	121
Sri Lanka	69	58

Ranking based on 9 parameters: Health impact, air pollution, water & sanitation, water resources, agriculture, fisheries, forests, biodiversity & habitat.



# What is in the air we breathe?



# PARTICULATE MATTER ( $PM_{10}$ & $PM_{2.5}$ )

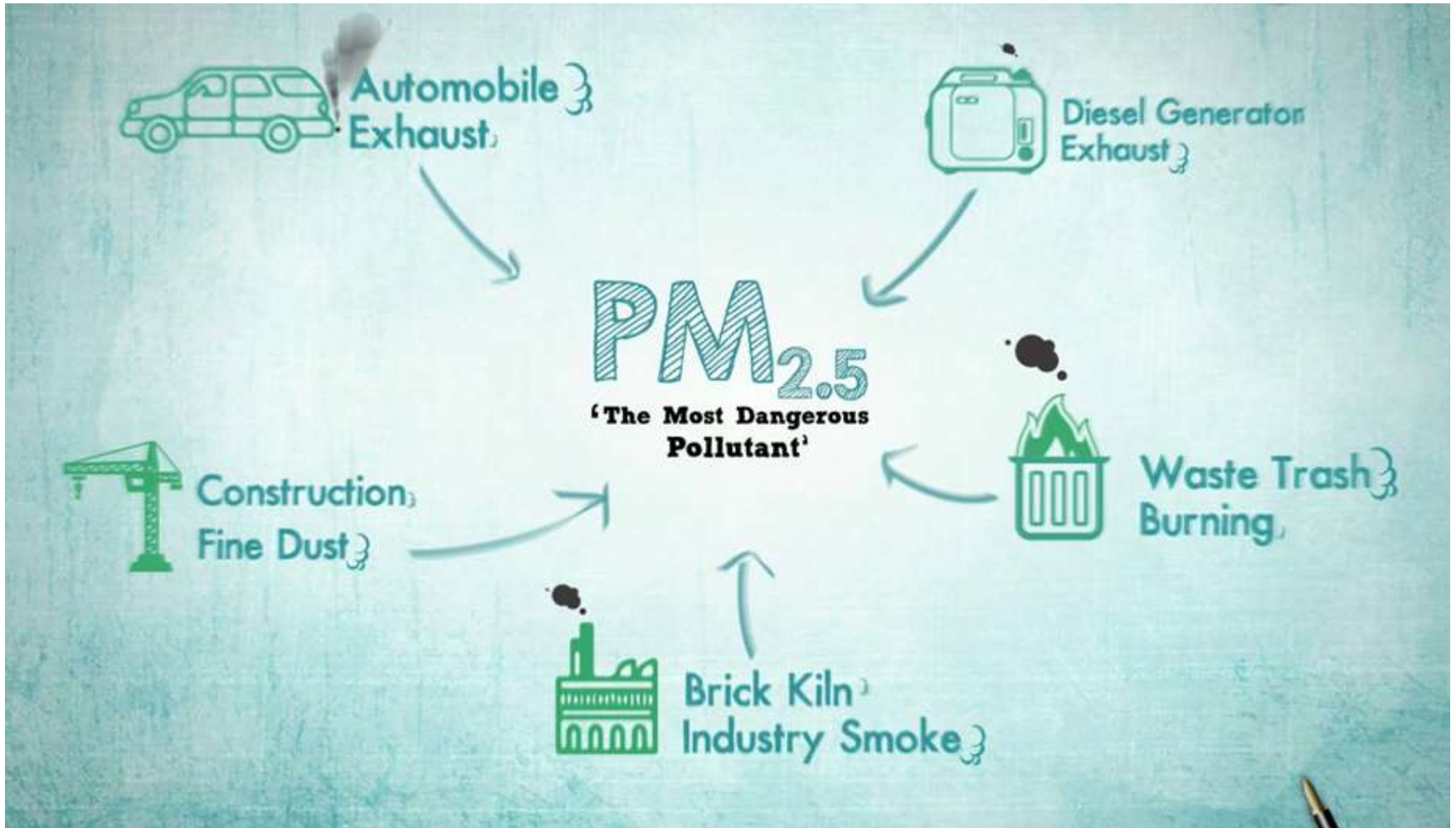
One of the most dangerous air pollutants



- ❑ Leads to - Premature mortality, chronic respiratory disease, weakening of eyesight. Pre-existing heart or lung or asthmatic patients very sensitive to respirable PM



# Sources of PM<sub>2.5</sub>





# ***VOLATILE ORGANIC COMPOUNDS (VOCs)***

*1200+ different VOC's*



❑ Leads to: Eye, nose, throat irritation, headaches, loss of co-ordination, nausea, damage to liver, kidney, and central nervous system. Some VOC's cause cancer in human beings



# ***SULPHUR OXIDES & NITROGEN OXIDES***

❑ **SO<sub>x</sub> Source** - Various industrial processes, electrical generation / power generation, space heating, iron heating in industries. Coal and petroleum often contain sulfur compounds, their combustion generates sulfur dioxide.

❑ **NO<sub>x</sub> Source** - Road traffic and combustion processes.



**Lead to** - Both NO<sub>2</sub> & SO<sub>2</sub> act mainly as irritants and affect the mucous of the eyes, nose, throat, and respiratory tract.

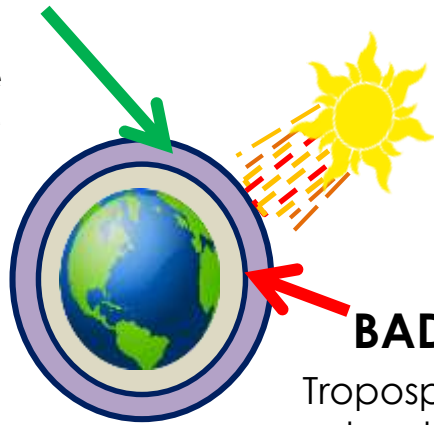


# OZONE ( $O_3$ )

*Forms in the atmosphere through a series of complex chemical reactions between oxides of nitrogen ( $NO_x$ ) and hydrocarbons*

## GOOD OZONE

Stratosphere, ozone protects us from the sun's harmful ultraviolet radiation



## BAD OZONE

Troposphere, ground level ozone can damage lung tissue and plants



**Leads to - Wrinkles on skin, sensitive lungs, increased asthma attacks & daily mortality**





# Top 11 facts about Air Pollution...





Safe concentration of **PM2.5** according to WHO is **25 micrograms** per cubic meter, a standard Delhi has met for only seven days in the last two years(730 days).





IT'S INVISIBLE

The most harmful **toxins** and **gasses** are completely **invisible** and **hidden** in what may seem like completely clean air .

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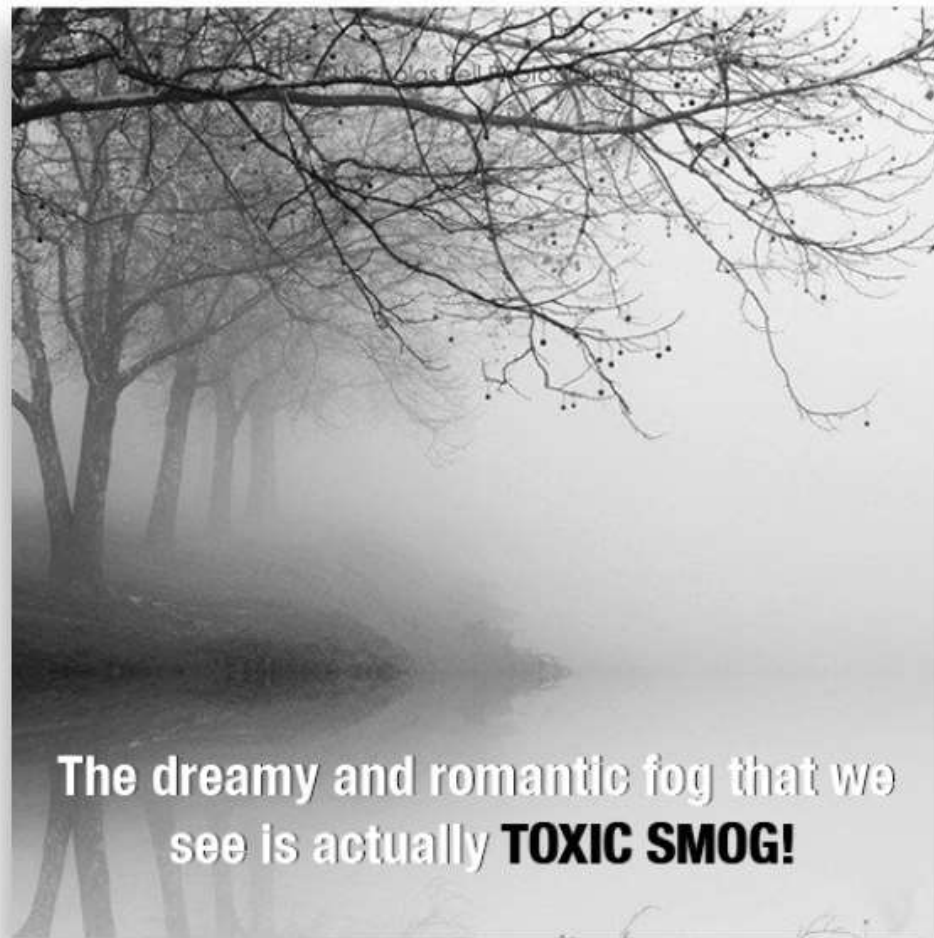




Living in Delhi equals to smoking twenty plus cigarettes every single day just by breathing the air around us.

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The **haze** that we see in Delhi during this time of the year is mistaken to be **fog** - gives us a false sense of security . Most of it is however **Smog**, which **causes respiratory** and other health problems.







The human bodies sense of **smell** tends to **numb** out and get **desensitized** pretty quickly .



## A BUSY ROAD OR A HIGHWAY IS EQUIVALENT TO HITLER'S GAS CHAMBER



Our exposure to VOCs, Sulphur dioxide, nitrogen oxide, carbon monoxide and ground level ozone, while on the road is well past any tangible safety levels.



## THE COMING OF SPRING ONLY MAKES THINGS WORSE

Sunlight combines with nitrogen dioxide and VOCs to create ground level ozone

As the season turns to **March** and the sun comes out, the **smog** clears and the air starts to look clearer. At this point we tend to let our guard down, but this is when the **worst pollutant** is created – Ground Level **Ozone**





Indoor **air pollution** is five to ten times worse than **outdoor air pollution**.



## FILTERING OUR DRINKING WATER COULD BE FUTILE IN COMPARISON

We drink two to four liters of water a day and we breathe ??? liters of toxic air.





**WE ARE AT A GREATER  
RISK OF PREMATURE  
MORTALITY.**



According to a study by **RICE university** there is a direct link between a **combination of ground level ozone and PM 2.5** and an increase in premature death rates.

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Air pollution lowers  
productivity & performance.



# How does air pollution affect us?



# AIR POLLUTION

HEALTH RISKS



climate.america.gov

#### Sources:

World Health Organization

<http://www.who.int/mediacentre/factsheets/fs313/en/>

U.S. Environmental Protection Agency

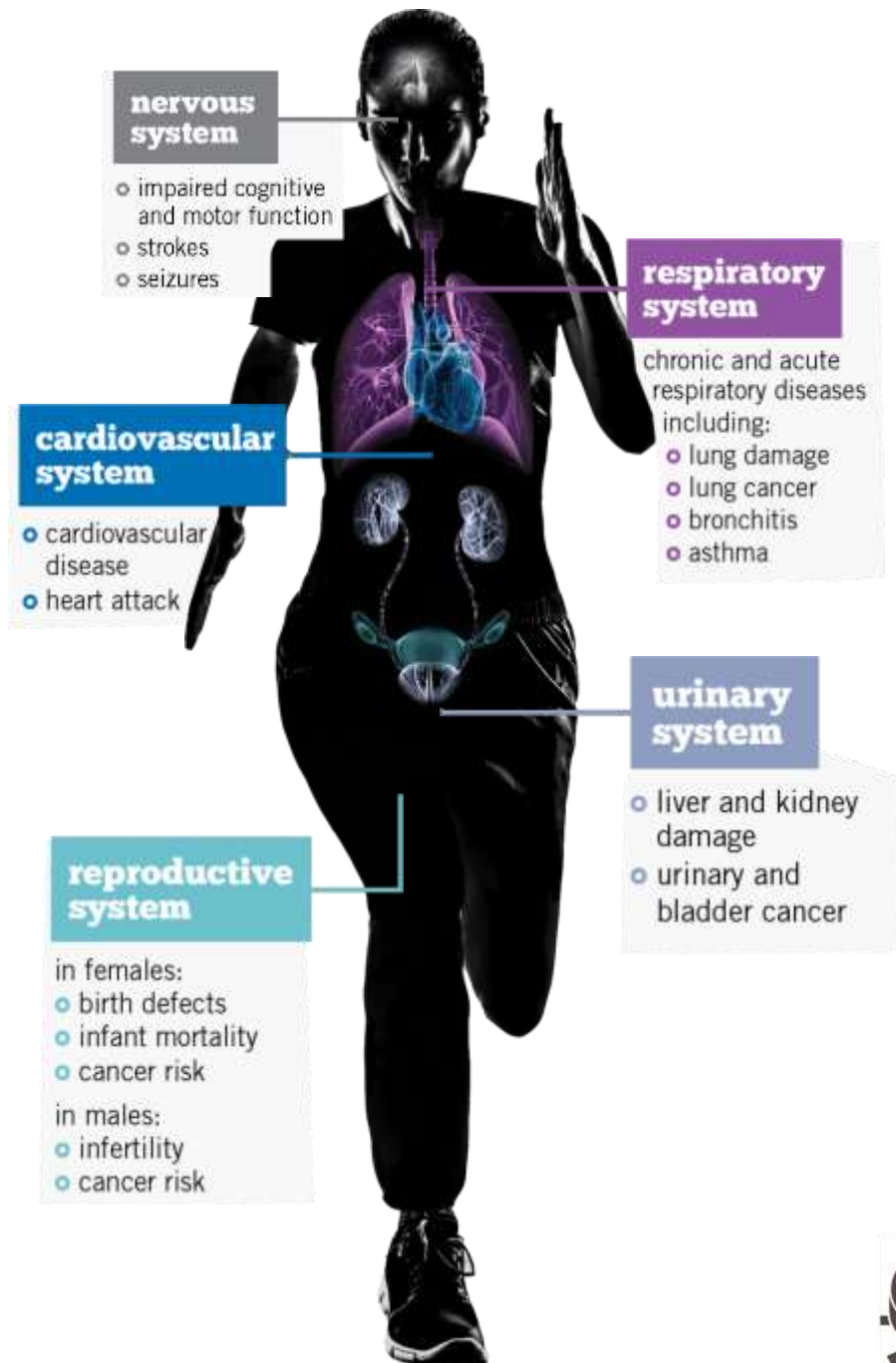
<http://www.epa.gov/region07/air/quality/health.htm>

National Institutes of Health

<http://www.niehs.nih.gov/health/topics/agents/air-pollution/>

Photos: Shutterstock.com

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# Some common myths about Air Pollution?







**Myth:** Odd/even experiment will make the problem go away.



**Myth:** I am Indian.....I am immune.

# Myths about air pollution



**Myth:** What doesn't kill us only makes us stronger.

**Fact:** We are dealing with toxins, not allergens - an anti-allergy pill will not help us.



# Myths about air pollution



**Myth:** We will become weak if we protect ourselves. Masks and air purifiers make us weak protecting us temporarily:



# Myths about air pollution



AIR POLLUTION  
IS **CHOKING**  
OUR TREES

**Myth:** If we plant more trees air pollution will go away:

**Fact:** The particulate concentrations in the air are so high at this time of the year that stomata on the plants and trees gets blocked and they become virtually ineffective.



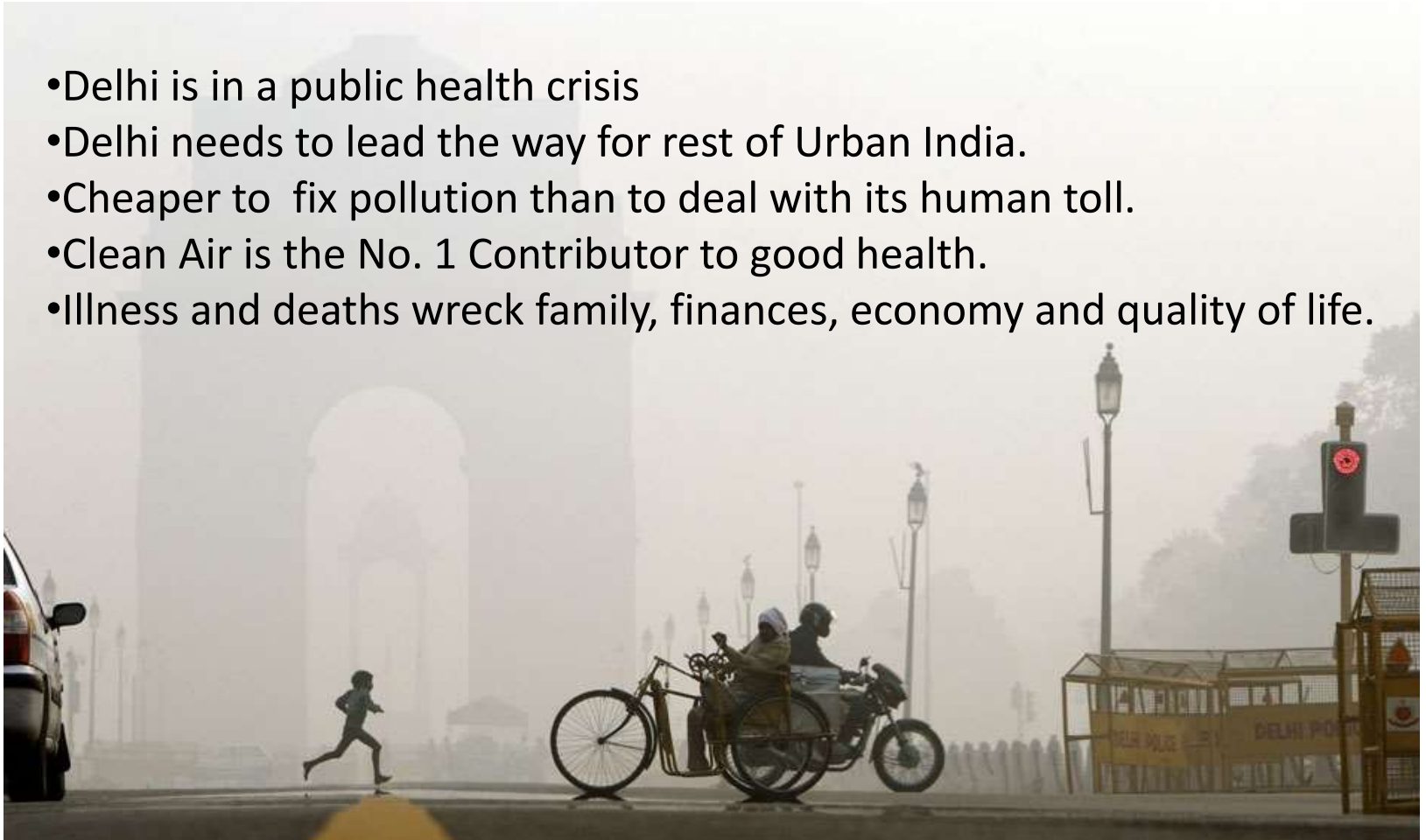


**So, where do we  
stand?**



# A Bold and massive intervention is required!

- Delhi is in a public health crisis
- Delhi needs to lead the way for rest of Urban India.
- Cheaper to fix pollution than to deal with its human toll.
- Clean Air is the No. 1 Contributor to good health.
- Illness and deaths wreck family, finances, economy and quality of life.



**I feel so helpless, what  
can I do?**



# Ways to reduce air Pollution – At home



- Conserve energy - turn off appliances and lights when you leave the room.
- Recycle
- Connect your outdoor lights to a timer or use solar lighting.
- Use low-VOC or water-based paints, stains, finishes, and paint strippers.
- Test your Air Quality at Home
- Choose not to smoke in your home, especially if you have children.



# Ways to reduce air Pollution – Buy Smart



- Buy ENERGY STAR products, including energy efficient lighting and appliances.
- Choose efficient, low-polluting models of vehicles.
- Choose products that have less packaging and are reusable.
- Shop with a canvas bag instead of using paper and plastic bags.
- Buy rechargeable batteries for devices used frequently.
- Buy local products



# Ways to reduce air Pollution – Drive Wise



- Keep tires properly inflated and aligned.
- In the summertime, fill gas tank during cooler evening hours to cut down on evaporation. Avoid spilling gas and don't "top off" the tank. Replace gas tank cap tightly.
- When possible, use public transportation, walk, or ride a bike.
- Get regular engine tune ups and car maintenance checks (especially for the spark plugs).
- Report smoking vehicles to your local air agency.
- Join a carpool or vanpool to get to work.





**What do we want the  
Government to do?**





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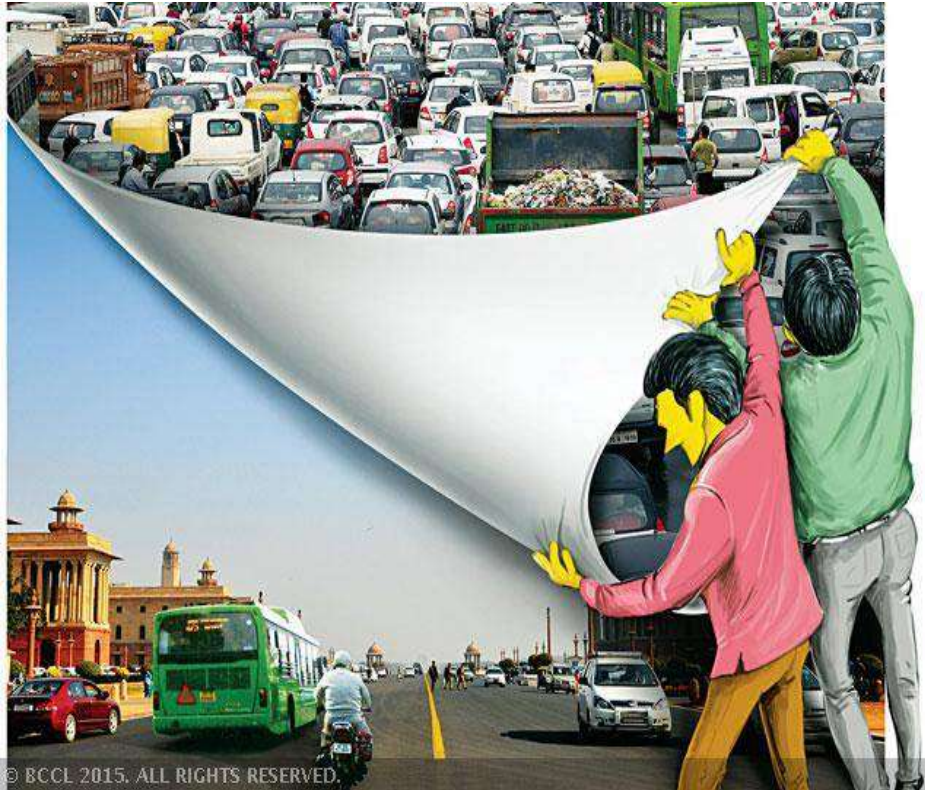
## Defensive

- Build awareness – alert mechanism, advisories, data.

## Offensive

- Develop and enforce emission standards
- Improve public transportation & traffic management
- Implement a waste management system
- Work on introducing Euro IV and other cleaner fuels now





## Incentivize good behavior

- Use of public transport
- Use of CNG & Electric vehicles
- Carpooling

## Penalize bad behavior

- Multiple cars
- High parking fees
- eToll to enter congested areas



# Key Takeaways

- **Protect Yourself**
- **Be Aware and stay aware**
- **Reduce your carbon footprint**
- **Be a spokesperson for Change**



# Helpline Numbers

**Trash Burning Complaint Number**

**+91 9717593574**

**Polluting Vehicle Complaint Number**

**011 42400400**



This is what clean air looks like



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