# Bengaluru Healthy Air Coalition



Dr Prashanth Thankachan

SJRI

# Greetings from St. John's!



**Medical College**
~700 students
~30 depts
~400 staff

**Hospital**
1350 beds
60 Depts
~3000 staff

**Nursing College**
~450 students
~20 depts

**Allied Health
& Hosp.
Administration**
~ 250 students

**Research Institute**
~350 projects

# Invisible Global burden

- 7 million deaths due to Air pollution globally

- 91%  of population live in places that exceed WHO guidelines

- 24% of all stroke and 25% of all heart disease related death attributed to air pollution

- 1·24 million deaths in India in 2017, were attributed to air pollution, 50% were in people younger than 70 years.

- Improving air quality in India would lead to an increase in life expectancy by 2 years

WHO, Lancet VOLUME 3, ISSUE 1, PE26-E39, JANUARY 01, 2019
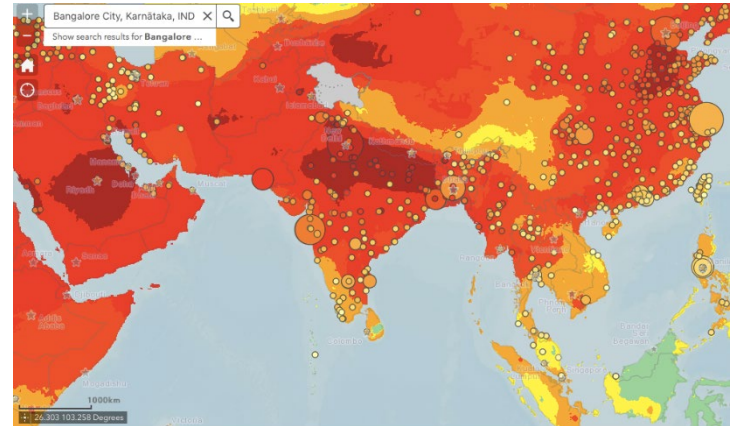
# Prospective Urban and Rural Epidemiologic (PURE) Study

Top 10 risk factors for cardiovascular disease in low-income countries, by population-attributable fractions

| Risk factor | Value |
|---|---|
| Hypertension | 14.3 |
| High non-HDL cholesterol | 14.2 |
| Household air pollution | 12.0 |
| Diabetes | 10.4 |
| Poor diet | 10.0 |
| Abdominal obesity | 7.0 |
| Low education | 6.0 |
| Tobacco use | 4.5 |
| Low physical activity | 2.2 |
| Excess alcohol | 2.0 |

Top 10 risk factors for death in low-income countries, by population-attributable fractions

| Risk factor | Value |
|---|---|
| Poor diet | 19.2 |
| Low education | 13.7 |
| Low grip strength | 10.9 |
| Household air pollution | 9.0 |
| Tobacco use | 7.6 |
| Diabetes | 6.7 |
| Hypertension | 5.6 |
| Low physical activity | 2.7 |
| Depression | 1.9 |
| Excess alcohol | 1.8 |

Lancet, 2019

# Bengaluru Healthy Air Coalition Launched



**Launched in April 2019, collaboratively between (SJRI, HEAL, GCHA)**

**Comprises of doctors, researchers, public health experts, Government sector (BBMP, Pollution Control Board), Media**

**Inauguration of air quality Monitors in Bangalore**

# Bengaluru Air quality monitoring

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## A citizens-led response to pollution

### Sustained citizen activism had forced closure of a polluting factory. But, citing standards, KSPCB has issues with independent pollution monitors

Stringent regulations have spectacularly failed to stem the slide of Bengaluru's once clean air into pollution levels beyond human endurance. But as polluting industries there, the closure of Graphite India in Whitefield offers a glimpse of hope. That sustained, vigorous citizen activism can indeed make a change.

Yes, the city's 80 lakh plus vehicles bellowing out mega tons of smoke across Bengaluru's labyrinthine road network in the real elephant in the room. That goes on without any regulatory mechanism to curtail skyrocketing vehicle numbers. But this still does not spare industrial emissions, mentioned by the Karnataka State Pollution Control Board (KSPCB) rulebook.

In a multi-pronged campaign against Graphite India's Bengaluru plant, residents in and around Whitefield had stood as one. Whitefield Rising, a citizens' collective, had called out the factory for spewing black dust across a huge perimeter for four decades. So, on April 2, when GI announced the closure of its operations here, it was a well deserved victory for people power.

An industrial pollution goes unchecked, particularly in the city's outskirts, concerns follow the Whitefield model to push KSPCB and other agencies into action mode.

**Independent monitors**

Currently, there are 23 air quality monitoring stations operated real-time by the KSPCB and 14 manual monitoring stations that measure PM10 on any two days in a week. But the citizens feel that the real-time data on the KSPCB website is not user-friendly. They find it tedious to understand and access location-specific data.

### Not calibrated: KSPCB

Insisting that its monitoring devices adhere to stringent standards, KSPCB contends that the devices operated by others are not calibrated. A Board official, preferring anonymity, notes that the instruments are kept at a height for the non-pollution air quality standards.

"The air quality should be measured where there is free flow of air, and that can happen only at heights of 3 to 10 metres," the official explains. "At three feet height, you don't measure ambient air quality, you only gauge the re-suspension of road dust due to vehicle exhaust hitting the kerbs."

KSPCB, the official informs, measures air quality continuously from seven monitoring stations at Central Silk Board, Hosur Road, Kavika, Mysuru Road, Shahid Ground, Jayanagar 5th Block, Veterinary College, Hebbal, NIMHANS, City Railway Station and Basaveshwaranagar. Besides, the Central Pollution Control Board has set up three such stations at BTM Layout, Peenya and Marathahalli.

**Initiatives galore**

Despite the Board's reservations over independent monitoring, several such initiatives have taken off across the city.

For instance, the Health Air Coalition, a health sector-led initiative for clean air in the city, now plans to install 40 stationary monitoring devices across the city. As many as 15 devices are already in place. The generated data is available to the public since April 5.

The devices now track the city's pollution level at locations monitored. As the BBMP head officer at Corporation Circle, BBMP public health care centres at Banashankari, JC road, H Siddaiah Road, N R Colony and Basavanagudi.

AirCare, a high-density particulate matter (PM2.5) monitoring network monitors PM2.5 levels 24/7 and hosts the data online for real-time tracking.

The network has been developed by Shiv Shankar, founder of Mapshalli, a non-profit organisation, and Varun Ramakrishnan, a class 12 student from The International School Bangalore, in collaboration with WhiteField Rising.

Using mobile devices, other groups in the city also monitor air quality over a seven-day period in Jayanagar, Banashankari, Silk Board, Electronic city, Uttarahalli and MG road.

**The GI case**

It was the data from AirCare and other sources outside KSPCB that helped track the pollution from GI, recalls Zibi Jamal from Whitefield Rising. "At GI, the pollution levels were peaking at 2am and 3am. It was very clear that vehicular emissions were not causing it. KSPCB was not tracking it 24/7," she recalls.

The GI factory closure might be a silver lining for citizens activism. But the onslaught of private vehicles continues unabated.

Vehicular emissions remain a formidable threat to Bengaluru's air, as reiterated by a study by Urban emissions, info and the Center for Study of Science, Technology and Policy (CSTEP).

**Pollution warning**

The study warns that by 2030, pollution from PM10 (particular matter less than 10 microns in size) will increase dramatically by 74%. Fuelling this dangerous spike will be the usual suspects: Vehicular exhaust, industrial emissions, on-road dust and construction dust.

At 43%, vehicular emissions are the single largest contributor to pollution in the city. While road dust accounts for 20%, industrial emissions and construction dust make up 14% each. Diesel Generator sets account for seven per cent.

**Rasheed Kappan**
(Inputs by Rakshitha R)

### K V LAKSHMANA
Retired mediaperson, Hosur Road

As we all get stuck in traffic jams, it has become very difficult to inhale the exhaust fumes. The infrastructure has collapsed, impacting the environment a lot.

### SAI PRASAD
Academician, Whitefield

Bengaluru has not added parks such as Lalbagh and Cubbon. This is grossly inadequate to control the rising pollution in the city, a definite sign of rapid and mindless urbanisation.

### MALAVIKA HARITA
Retired CEO

Rising number of private personal vehicles is a definite trigger for increase in air pollution. But I don't blame people for buying their own vehicles. A lot of us wouldn't buy a vehicle if we had an efficient public transport system.

### RAHUL SIDGIDDI
Digital Marketer, Malleswaram

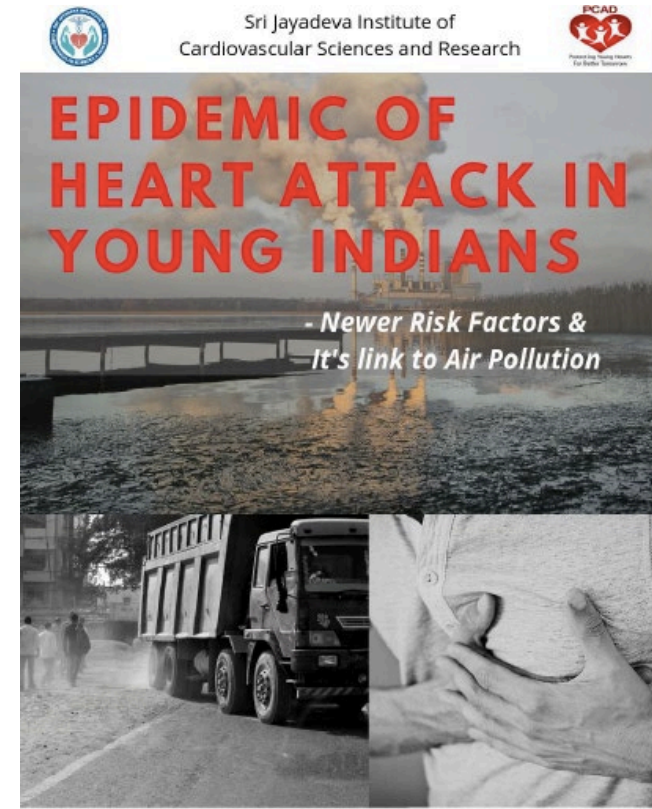Dehydration is a common phenomenon and people of all age groups are falling prey. The pollution levels have shot up. The dust in the air is causing respiratory problems.

## Beating the heat a tough task, breathing toxic air tougher

As the 'most pleasant weather' tag slips away from Bengaluru, as the mercury levels go beyond 37 degrees this summer, rising air pollution has made it all worse. Increased industrial activities, unregulated vehicular emissions and construction dust have all combined to aggravate it further.

K V Lakshmana, a retired mediaperson and a resident of the city, observes: "As we all get stuck in traffic jams, it has become very difficult to inhale the exhaust fumes. The infrastructure has collapsed, impacting the environment a lot.

The city, he says, is booming with its residential, industrial and IT sectors dotted with restaurants galore, all conveniently located close to offices. But these outlets also draw a stream of private personal vehicles, bringing with them high pollution.

The highways and arterial roads also bring in a host of intra-city and long-distance trucks, billowing out smoke, generated by the ceaseless construction boom.

In this rising pollution graph, academic resident, Malavika Harita finds a definite trigger for increase in air pollution. But Harita does not blame people for buying their own vehicles. "A lot of us wouldn't buy a vehicle if we had an efficient public transport.

Rising number of private personal vehicles is a definite trigger for increase in air pollution. "As someone who has grown up in Bangalore and belongs here, I can feel how warm it has become over the years. Winters have disappeared. I have put away all my sweaters. Don't need them anymore," she says.

The deadly mix of pollution and heat has made it worse, Harita notes. "You cannot drive around the city with the windows down, or you need air conditioning again. If you want to live in Bengaluru you will surely need a personal air-conditioned bubble."

Beyond construction dust and industrial emissions, it is the sheer number of vehicles over 15 years old that cause maximum pollution. Most of these run on a mixture of kerosene and diesel to save money, but in the process release smoke that is extremely polluting.

The Metro project has been going on for years. There is no specific public transport plan for the future. The existing systems, she adds, are too overcrowded for people to switch from their private cars to the public transport.

The pollution has had a huge negative impact on public health. "There is a big increase in respiratory diseases. You can actually feel your throat tickling at your eyes burning," says Harita. "I was also reading somewhere that the increase in cancer cases could be attributed to increasing pollution levels."

But it was then, years ago. The IT sector grew, but the city's environment has been destroyed. Bengaluru sacrificed its abundant water bodies at the altar of development. Unreal growth should have been directed in the right way without jeopardising the city's citizens and environment.

Lack of entertainment for a huge working population meant setting up more and more malls. "Bengaluru has not added parks such as Lalbagh and Cubbon. This is grossly inadequate to control the rising pollution in the city, a definite sign of rapid and mindless urbanisation," he laments.

**Pooja Deshpande**

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**Highest Pollution Readings from KSPCB Monitoring Stations**

| No. | Station Location | Air Quality Index |
|-----|------------------|-------------------|
| 1 | Rail Wheel Factory, Yelahanka | 147 |
| 2 | Central Silk Board, Hosur Road | 129 |
| 3 | Shahid Ground, Jayanagar 5th Block | 118 |
| 4 | City Railway Station | 111 |
| 5 | Kavika, Mysuru Road | 108 |
| 6 | Yeshwanthpura Police Station | 107 |
| 7 | Swan Silk Pvt Ltd, Peenya | 106 |
| 8 | AMCO Batteries | 105 |
| 9 | Veterinary College, Hebbal | 103 |
| 10 | Rajiv Gandhi Institute of Chest Diseases, NIMHANS | 101 |

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# BBMP inaugurates the launch of the Healthy Air Coalition Bengaluru

Healthy Air Coalition Bengaluru was launched with an inaugural ceremony at the St John's Research Institute, Koramangala. BBMP Additional Commissioner for public health, D Randeep inaugurated the launch of a network comprising of 40 air quality monitoring devices installed across the city. The network currently installed is spread across 15 different locations in the city. Ricky Kej, Grammy awardee, was the guest of honour.

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# Air quality tracking gets a private push

## Pvt players set up own air monitoring stations

**BENGALURU:** The plummeting air pollution level in Bengaluru has lead to many private organisations to lock horns with the Karnataka State Pollution Control Board (KSPCB) to check and disseminate air quality details.

Now, both the private players and civic bodies are setting up their own monitoring stations across the city.

While the KSPCB measures air quality on terraces of buildings, the private players and individuals measure the human-breathable level making it a game changer.

There are only 10 online monitoring stations operated in real-time by the KSPCB and 14 manual monitoring stations which measure PM10 on any two days in a week. But the citizens feel that the real-time data on the KSPCB website is not user-friendly. They find it tedious to understand and access location-specific data.

Meanwhile, KSPCB senior environmental officer Gurumurthy ensured that the data would be available soon on the website.

"We are holding a meeting with stakeholders in three days and will come up with a mitigation plan to tackle the pollution. We will submit it to National Green Tribunal for its approval. Meanwhile, I will direct my authorities to upload pollution data on the site," he said.

The Health Air Coalition, a health sector-led initiative for clean air in the city, plans to instal 40 stationary monitoring devices across the city soon, with the first 15 already installed and generating data available to the public by April 5.

The coalition will maintain the monitors for a year so that by the end of the monitoring period, health experts can carry out a comparative analysis of annual average concentrations against WHO recommendations and Indian standards.

The location of the monitors has been chosen in collaboration with health experts at the St John's Research Institute, BBMP and KSPCB. Some of the locations include BBMP head office at Corporation Circle, BBMP public health care centres at Banashankari, JC road, H Siddaiah Road, NR Colony at Basavanagudi and other places.

### Mobile monitoring

Other groups are also monitoring pollution.

AirCare, a high-density particulate matter (PM2.5) monitoring network developed by an NGO in collaboration with Whitefield Rising group, monitors PM2.5 levels at 10 places.

Using mobile devices, other groups in the city also monitor air quality over Seven days at Jayanagar, Banashankari, Silk Board, Electronic city, Uttarahalli and MG road.

"We will carry out mobile monitoring with selected participants to better understand individual exposure and hotspots in the city," said Aishwarya Sudhir, a representative from Health Air Coalition.

"We will also share the pollution data and health impact assessments will with policy-makers for deliberations on air quality measures," Aishwarya added.

Ashish Verma, Professor of Transportation Engineering, IISc, said: "Right now we are discussing only the monitoring stations. The experts and civic authorities should also focus on the mitigation plan by identifying and having a clear idea about the sources of pollution."

**DH News Service**

*While the KSPCB measures air quality on terraces of buildings, the private players and individuals measure the human-breathable level.* DH FILE PHOTO

# Bengaluru sources of Pollution



PM$_{2.5}$ emissions : source-wise share in tons in 2015 and 2030 (projected)

Contributions from outside the urban airshed — 15.7%

BRICK KILN — 2.6%

DIESEL GENSET — 4.0%

16.1%

23.0%

TRANSPORT — 26.5%

RESIDENTIAL — 9.9%

INDUSTRIAL — 2.1%

DUST

1800 new vehicles added to Bengaluru roads every day.

IISc Study from 2010 projected Bengaluru vehicular traffic to be 68 lakhs by 2020. Currently, 80 lakh vehicles on road.

most cars single person driven, during peak hours 15km can take ~1.5 hours.

Bengaluru generates around 4500-5000 tons of waste per day

# Adverse Effects– Silent Health Emergency

- 35% of heart attacks in Bengaluru occur in young individuals (20-40 years) with no known cardiovascular risk factors. Most of them cab drivers (Dr Patil, Jayadeva Institute, Bangalore)

- Clear relationship between heart attacks, stroke and respiratory illnesses with poor air quality, with more hospital admission on high pollution days in 9 cities in the UK (Guardian, 21 Oct, 2019)

# Health as a driver for change
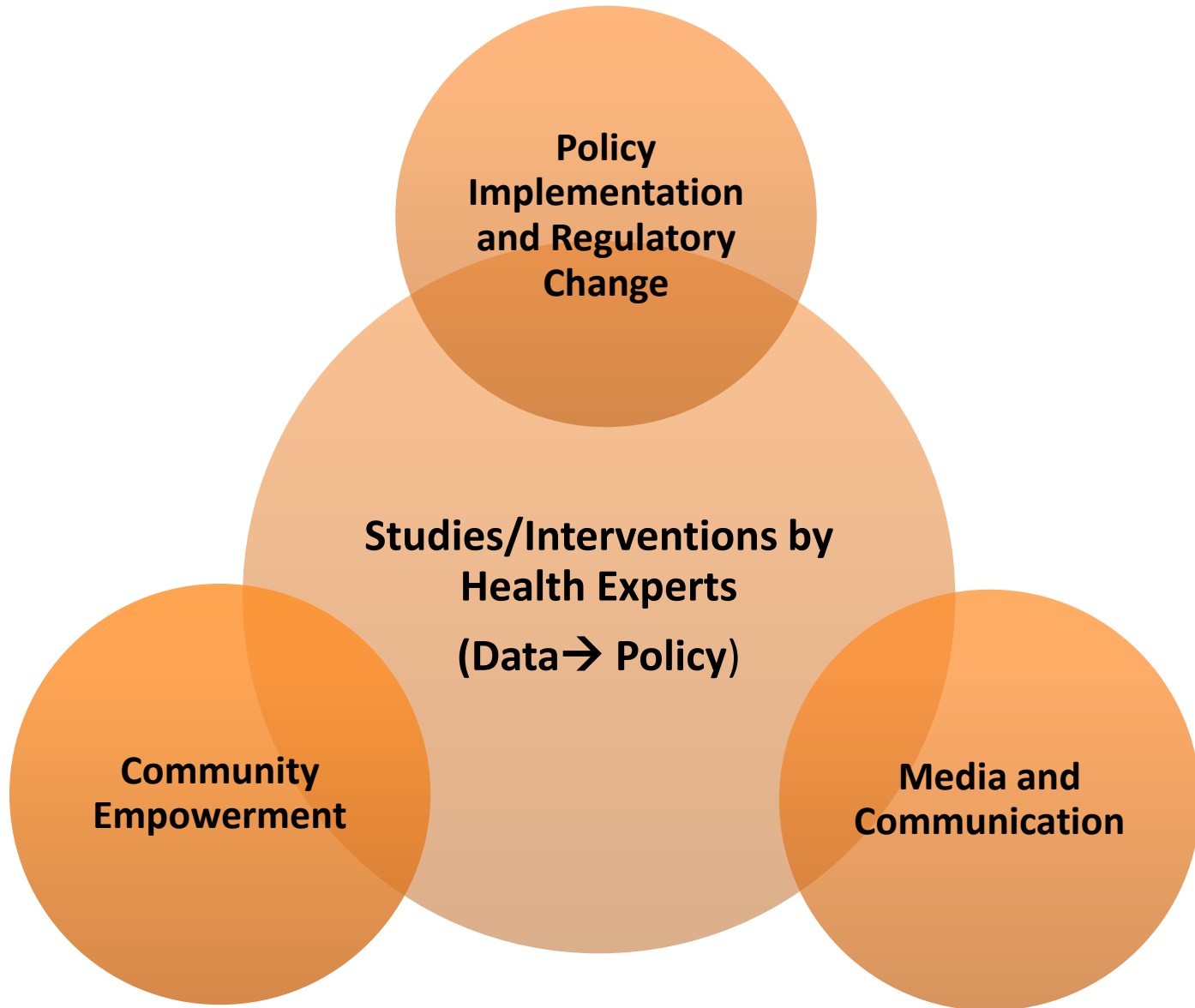
# Bengaluru Healthy Air Coalition

**Evidence based Data to drive Policy**

| Compiling existing research and creating new research to address data gaps | Release of data/Peer reviewed papers/Workshops and consultations | Advocacy with pollution control board and ministry of health |
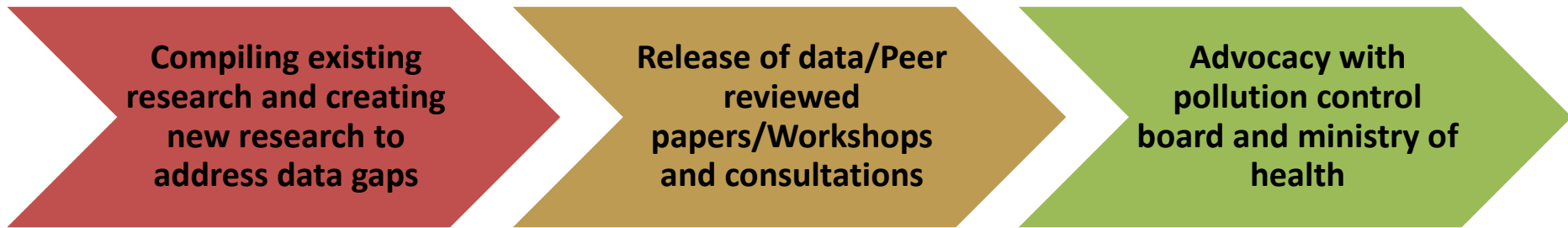
**Acknowledge that Air Pollution is a serious health threat and affects all**

**Data driven development of action plan with health as a focus**

**Measure the impact of action plan implementation**

# MEASUREABLE OUTCOMES/MILESTONES

## Acknowledge that Air Pollution is a serious risk factor to health

| Specific Activities | Outcome/Milestones |
|---|---|
| A workshop on air pollution, existing data vs data gaps with scientists, doctors, health care professional | Data-driven conversations led by health experts, doctors and air quality scientists |
| Workshop II, in continuation of the above | Need for specific interventions/change in the existing policy framework based on data |
| Advocacy with state-level agencies and elected representatives | Push the change forward |
| Similar workshops in other cities | Standardised approach |

# Data-driven action plans with health as a focus

| Specific Activities | Outcomes/Milestones |
|---|---|
| Consultation on city-level action plan and the need for focus on health | Identifying air pollution as a health threat rather than a tech-fix and the need for health experts to step in. This workshop will help identify key areas that require consultation from health experts (based on data/evidence) |
| Collaboration on solutions for air pollution with organisations working on transport and waste burning. | Using data from studies on health outcomes to actively advocate the need for public transport and sustainable practices in segregation and management of waste in the city. |

# Bengaluru Healthy Air Coalition

**Community Empowerment**

Interaction of doctors with informed citizen and environmental groups on data and research. Sharing of knowledge .

Better understanding of health impacts and the demand for health advisories

Pressure on the regulators and the local governing bodies to control and address pollution

Translating the knowledge

Help people affected such as asthmatics prevent exasperations

Affected groups and informed citizens can better relate and demand change at community level

# Bengaluru Healthy Air Coalition

**Media and Communication**



Release of data analysis, reports - Interaction with population

Enable public discourse on pollution. identify solutions

Lead to interventions and sustainable actions

Validated information to the masses

Build and sustain the needed change

Resulting in better air quality

# Long term

```
┌── Transport dpt
│
├── BBMP
│
├── KIADB
│
├── BDA
KSPCB/Chief
Secretary ├── Food and Civil
│
├── BMRCL
│
├── BMTC
│
├── KSPCB
│
└── Dpt of Energy
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## BENGALURU CITY ACTION PLAN

**Nodal Implementing Agency – KSPCB**

**Inter-departmental coordination between 9 different agencies**

**Availability of data on multiple platforms**

**BBMP to tackle road works, waste management**

**Transport dept to improve public transport and find ways to encourage public use – dedicated bus lanes**

**BBMP has shared responsibility with BDA, BMRCL and BMTC**
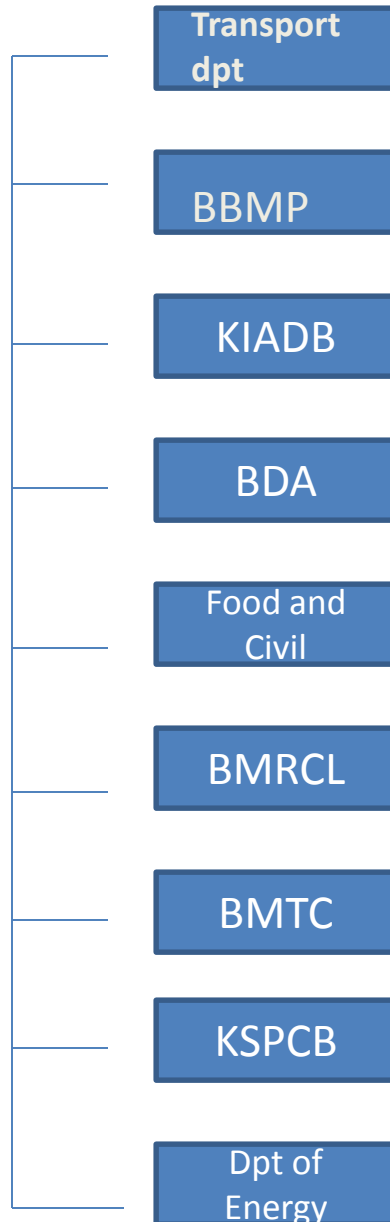
# Bengaluru Healthy Air Coalition

**Short term engage**

- School children to positively influence their surroundings (home, social peers, community) for a change.

- Encourage pvt sector to incentivise clean air seeking behaviours and activities.

- Plan events to disseminate clean air as a health need in educational institutions (seminars, debates, innovation etc)

- Make available simple factsheets for the common man to relate to this problem

- Learnings from London's Clean air initiatives, how can it be adapted to Bengaluru's needs

# Bengaluru Healthy Air Coalition

**OUR STRENGTHS**

Diverse stakeholder groups, experience in designing studies and informing policy, working with the local administration, committed and well educated citizen groups.

**CHALLENGES**

Change can cause disruptions that can affect large populations and their livelihood,  fast growing economy, bureaucracy, need a stable Govt for implementation

**NEXT STEPS**

Funding, identify research gaps, design studies and help develop and implement the action plan for Bengaluru

# Bengaluru Healthy Air Coalition

# THANK YOU!