Clean Air Catalyst

A Global Partnership for Accelerating Clean Air Solutions

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WORLD RESOURCES INSTITUTE

Vital Strategies

Jakarta
a city of collaboration

Patient Guidance

Presented by Ginanjar Syuhada

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Objectives

- Overview of air pollution exposure pathway
- Clinical interventions to manage health effect and reduce exposure
- Public health solutions to air pollution
- (Diagnostic) Relevant data to be collected and integrated with health outcomes data

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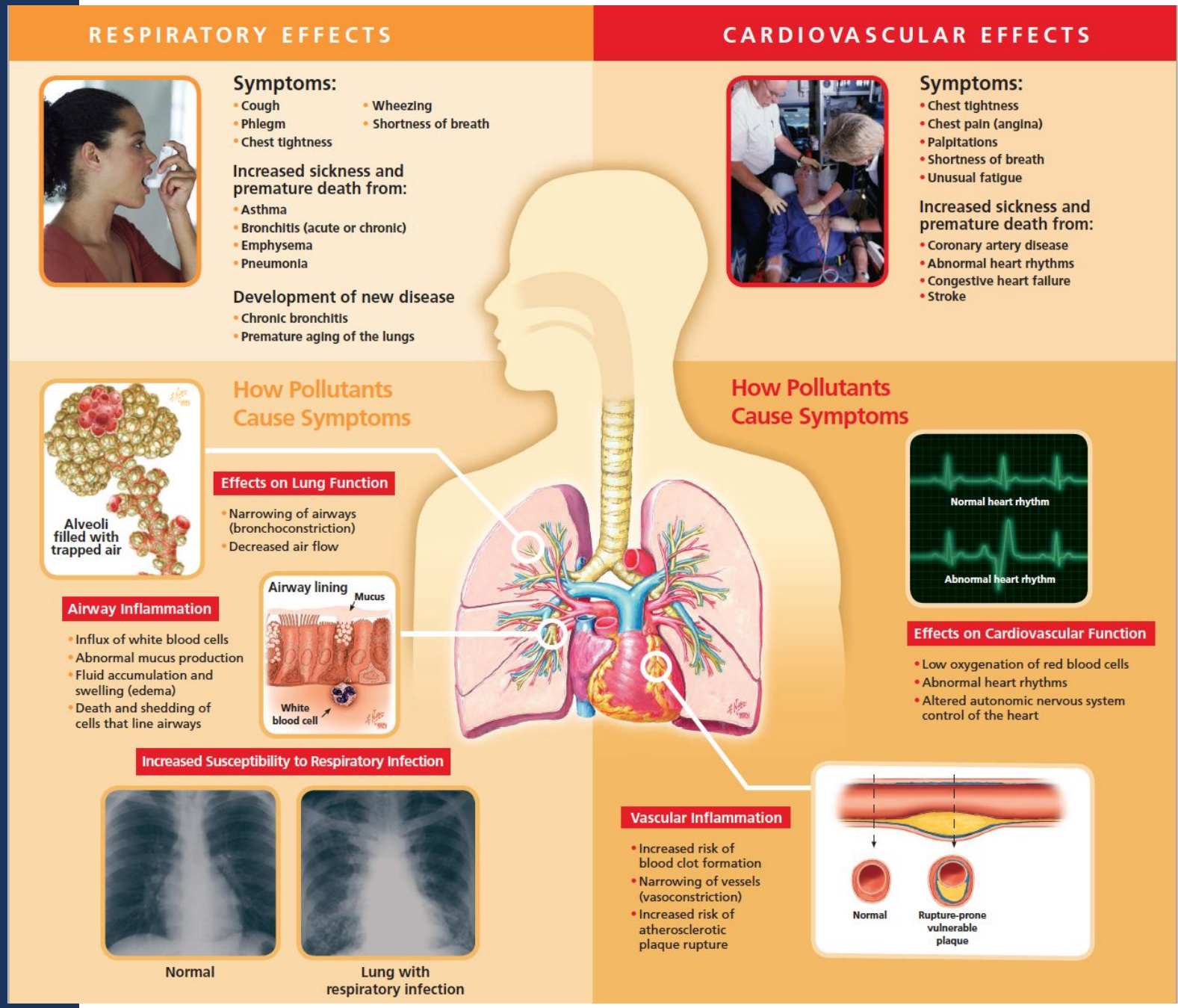
Review: Air pollution has adverse health effects along the life course

IMPACT OF AIR POLLUTION AT DIFFERENT LIFE STAGES

PRENATAL	BIRTH	EARLY CHILDHOOD	LIFE-LONG IMPACTS
Reduced growth	Preterm birth and low birth weight	Decreased lung growth, reduced lung function, lower respiratory infections, including pneumonia, and developmental effects	Chronic respiratory and cardiovascular disease

Review: Air pollution has adverse respiratory and cardiovascular effects



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Exposure Pathway

intervention by clinicians

https://ehp.niehs.nih.gov/1307866/

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What are some examples of clinical interventions that can help manage existing health conditions after they have manifested?

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Medical treatment can help manage existing health conditions

- Suggestive evidence that inhaled corticosteroids for asthma may reduce airway inflammation response to air pollution.
- Suggestive evidence that statins or supplements with anti-inflammatory effects may reduce some cardiovascular responses to air pollution.
- Prevention (e.g., smoking avoidance, flu immunization) and optimized management of air pollution-sensitive conditions

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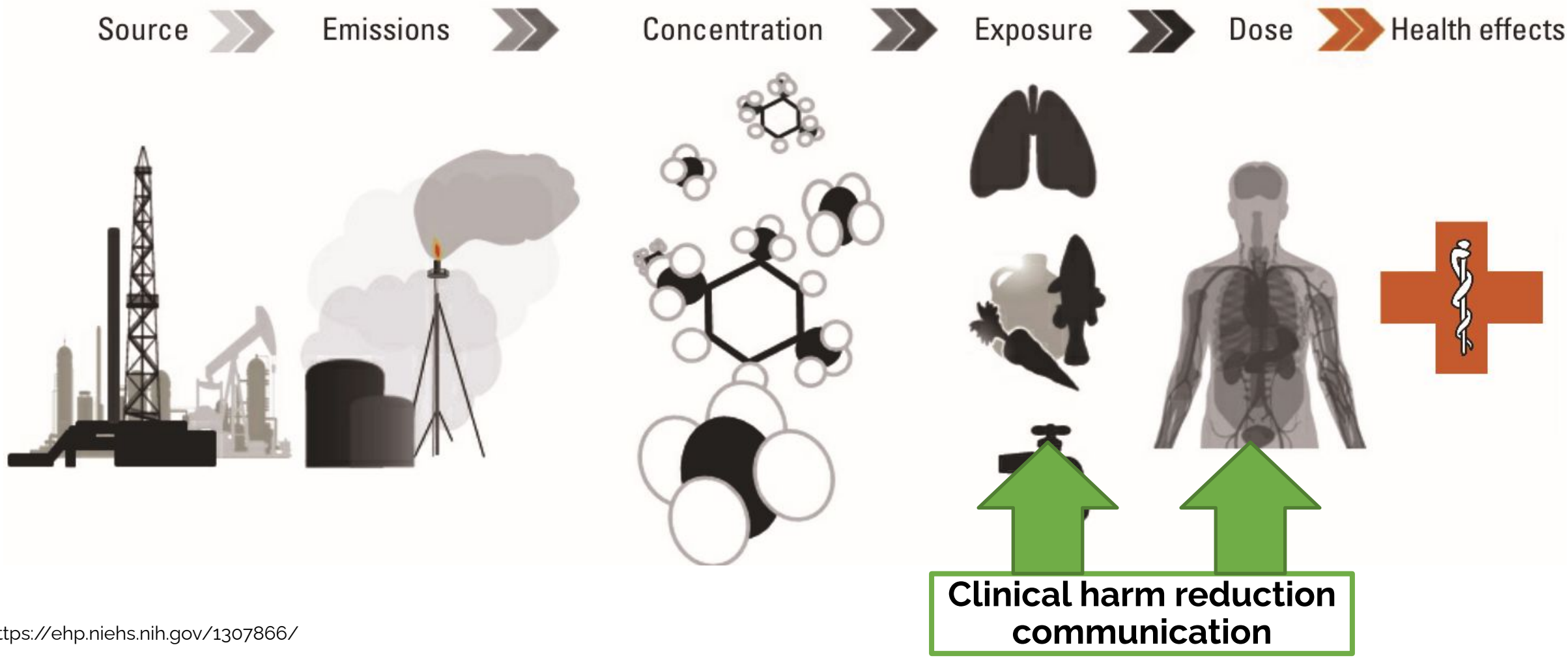
Clinicians can communicate harm reduction strategies to reduce exposure



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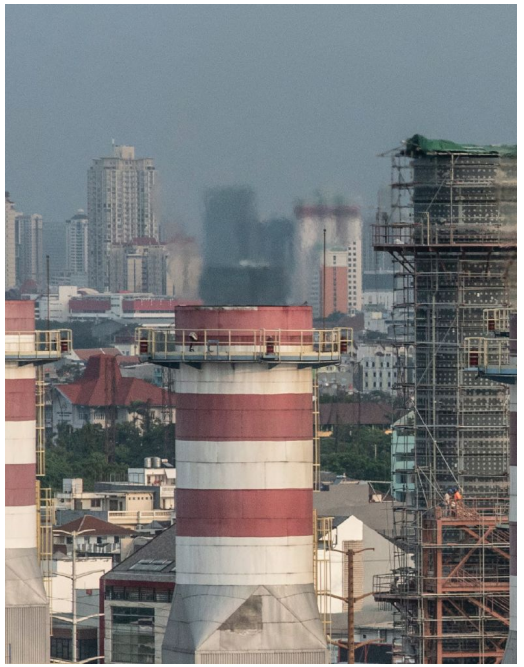
Communicate about leading sources of air pollution in Jakarta

Land transportation

Smelting, manufacturing, and chemical industry factories



Power plants

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Clinicians can communicate harm reduction strategies to reduce exposure

Advise patients to:

- **Be aware of the air quality** in the environment, especially if there may be sudden changes in air quality. Check the Jakarta Clean Air website (www.rendahemisi.jakarta.go.id) for daily air quality conditions.
- **Remain indoors** as much as possible on poor air quality days to reduce your exposure to pollutants.
- If walking or exercising outdoors, try to **avoid areas with heavy vehicular traffic** or near known pollution sources.

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Air filters and masks are ineffective

- Particulate and gas filters require frequent filter replacement and maintenance
- Effectiveness depends on the type of pollutants, mask design and how they are used
- Simple paper dust masks and surgical masks allow particulate through
- N95 masks may offer inadequate protection due to fit and compliance

False sense of security can lead to greater exposures

What can you ask patients to help you identify links between a health complaint and air pollution exposure?

Diagnostic Questionnaire Checklist

- ✔ When did the [symptom or complaint] begin?
- ✔ Does the [symptom or complaint] exist all the time, or does it come and go? That is, is it associated with times of day, days of the week, or seasons of the year?
- ✔ (If so) Are you usually in a particular place at those times?
- ✔ Does the problem abate or cease, either immediately or gradually, when you leave there? Does it recur when you return?
- ✔ What is your work? Have you recently changed employers or assignments, or has your employer recently changed location?
- ✔ (If not) Has the place where you work been redecorated or refurnished, or have you recently started working with new or different materials or equipment? (These may include pesticides, cleaning products, craft supplies, et al.)
- ✔ Have you recently changed your place of residence?
- ✔ (If not) Have you made any recent changes in, or additions to, your home?
- ✔ Does anyone else in your home have a similar problem? How about anyone

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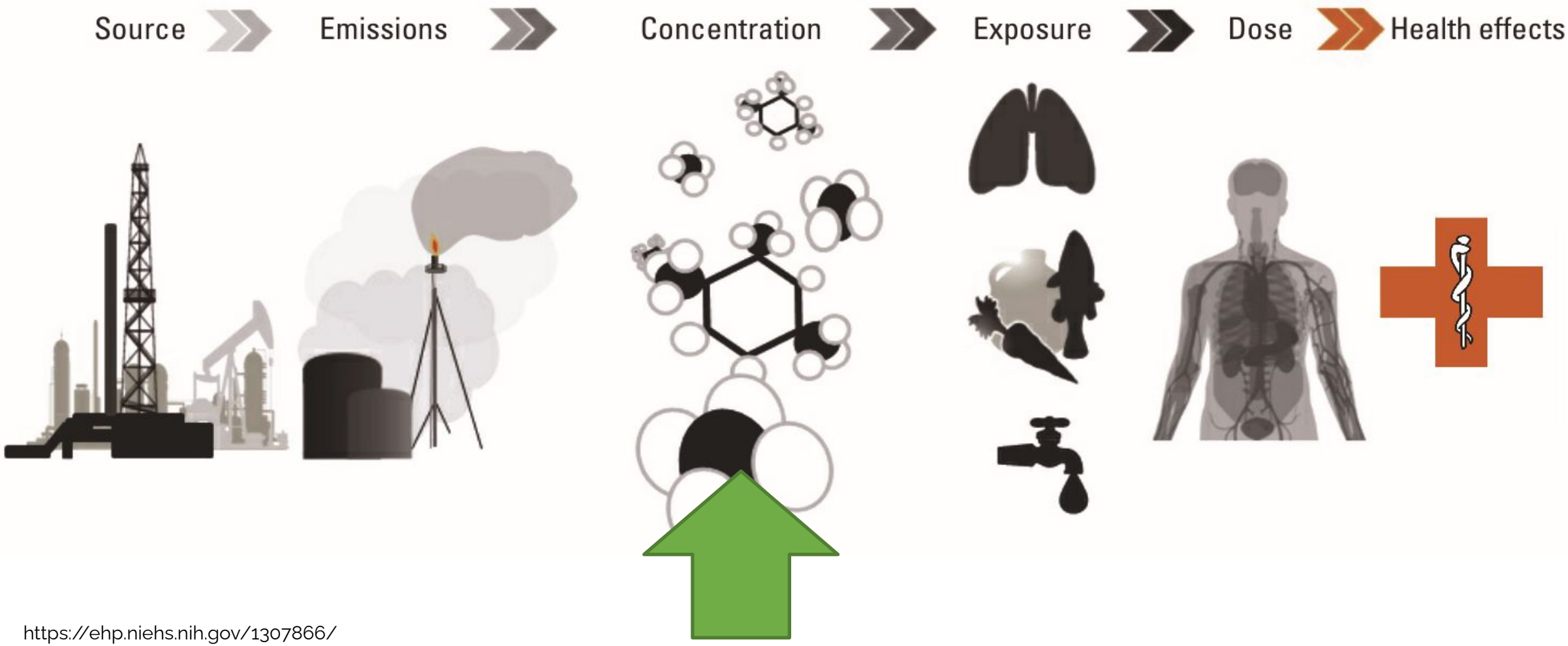
Some short-term strategies attempt concentration control



https://ehp.niehs.nih.gov/1307866/

New Delhi enforces 'odd-even' road law to tackle fatal levels of air pollution

Kelly Burke • 7NEWS Tuesday, 5 November 2019 5:54 am

"They did this scheme twice before and it is pointless," said Amit, a driver. "I am not supposed to be taking my car out today but I am just taking the back roads and short cuts to avoid the traffic officers. All the other drivers I know are doing the same. Yes pollution is a terrible problem, I have had an awful chest infection for the past two days because of it, but this temporary scheme is not going to change anything. We need real action from the government."

-The Guardian, 4 Nov 2019

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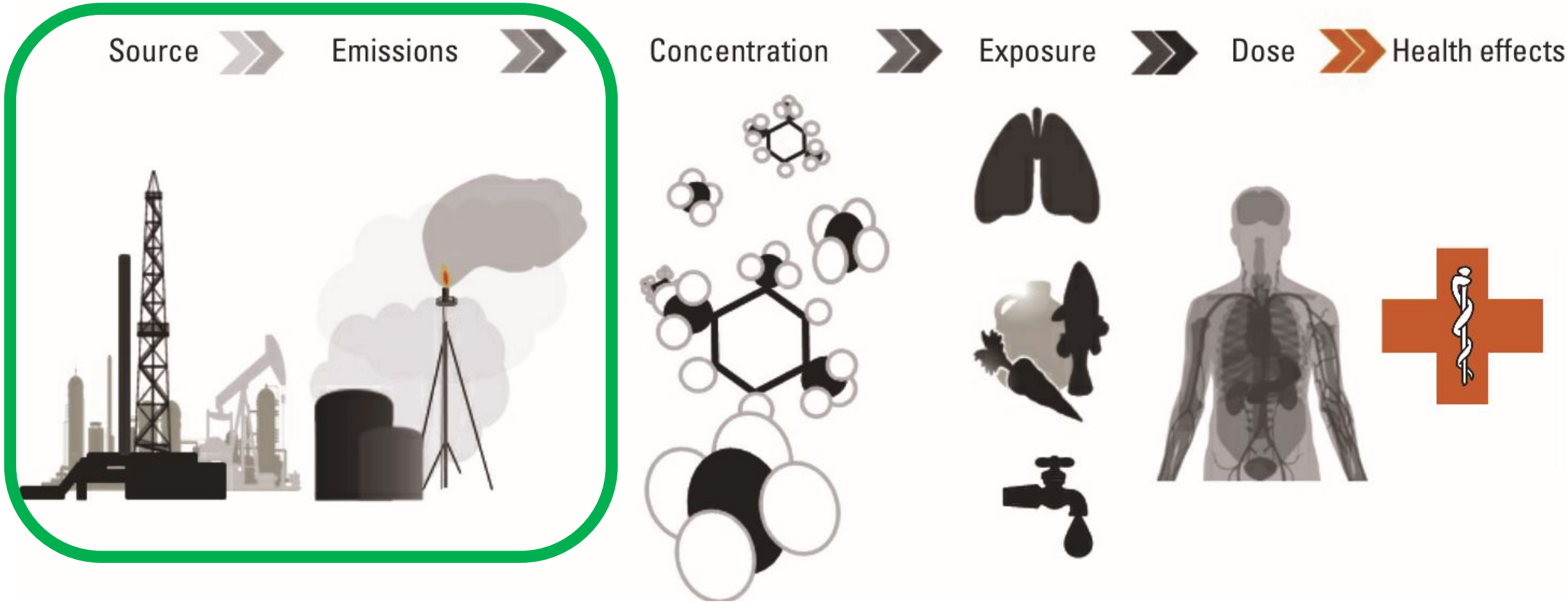
Public health solutions can reduce air pollutants at their sources



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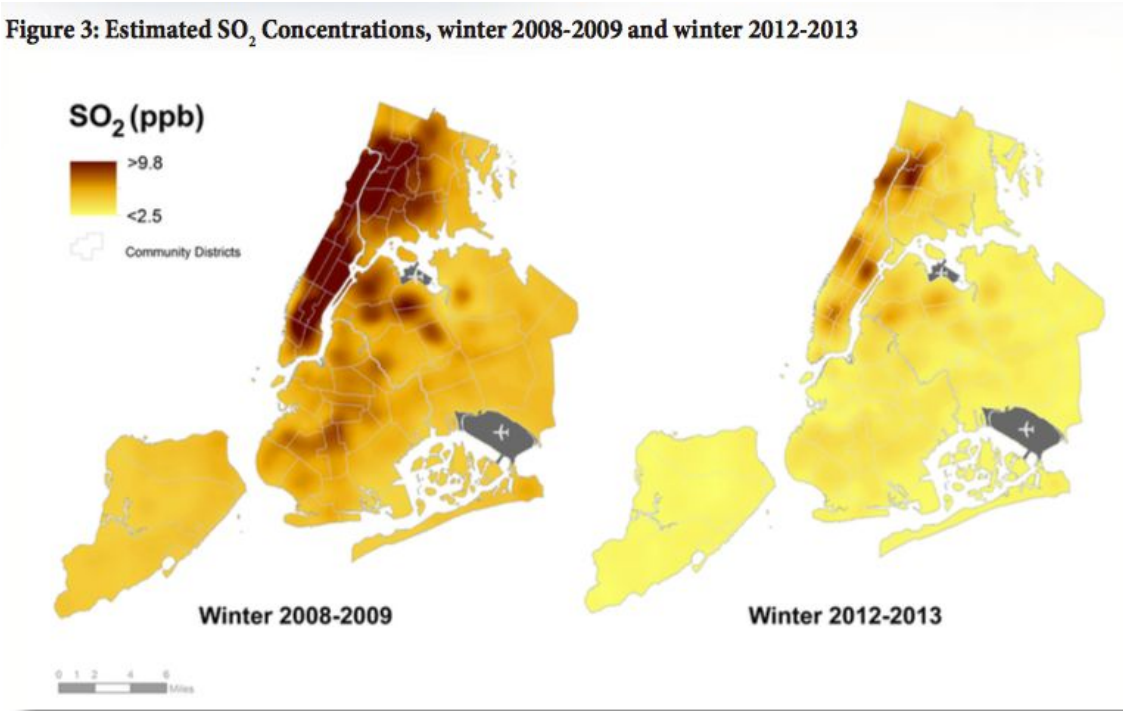
Mayor Bloomberg Announces New York City's Air Quality has Reached the Cleanest Levels in More than 50 Years

September 26, 2013

Levels of sulfur dioxide in the air have dropped by 69% and since 2007 the level of soot pollution has dropped by 23%.

The cleaner air is preventing 800 deaths, 2,000 emergency room visits and hospitalizations from lung and cardiovascular diseases annually, compared to 2008.



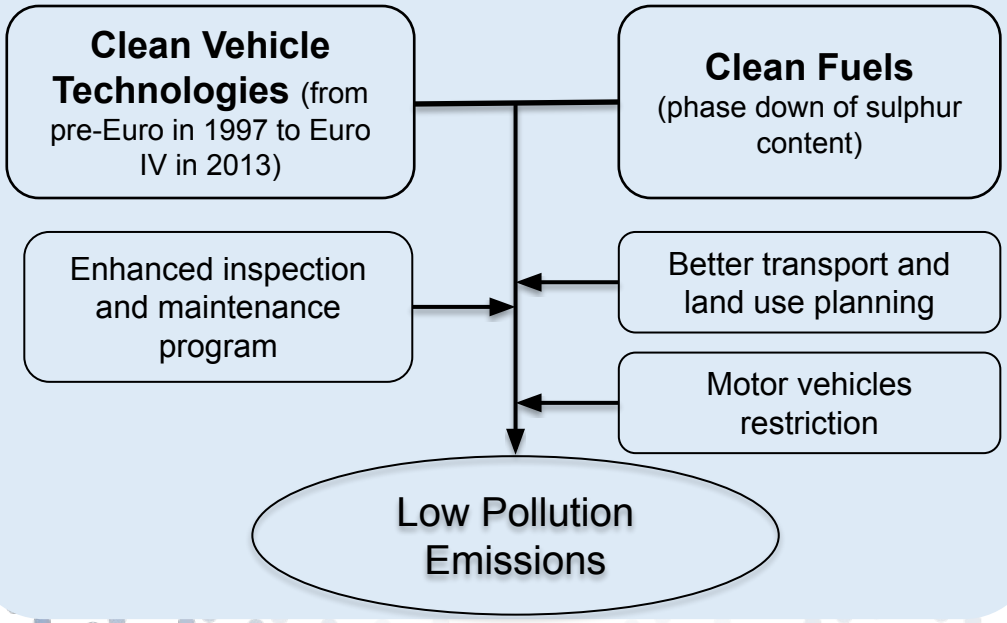
Bangkok, Thailand

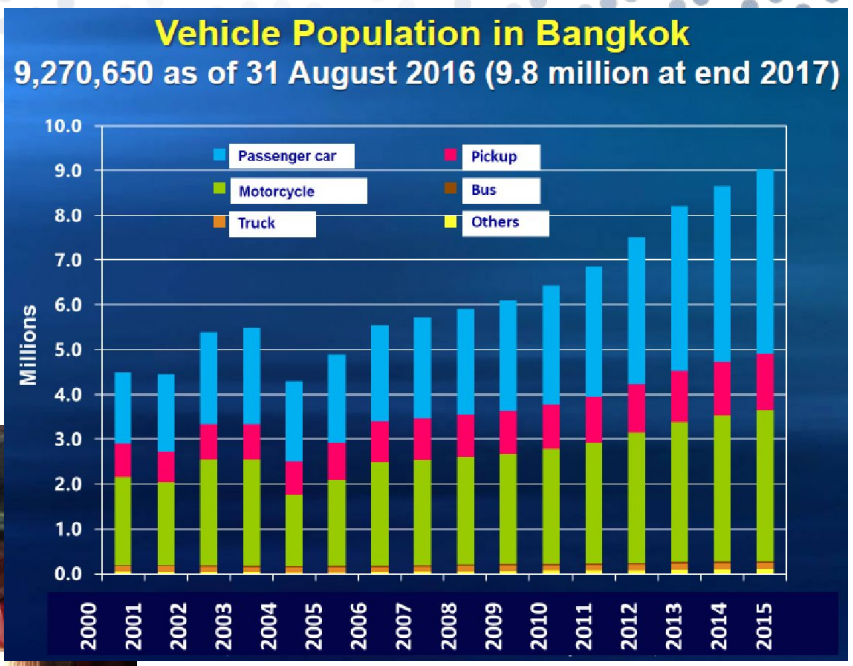
Tackling vehicular air pollution through comprehensive vehicle pollution control strategy

Innovation in Source Identification

Local emission inventory identified mobile source to be the largest source of air pollutants in Bangkok, accounting for nearly 54% of the PM_{10} emission in 1997

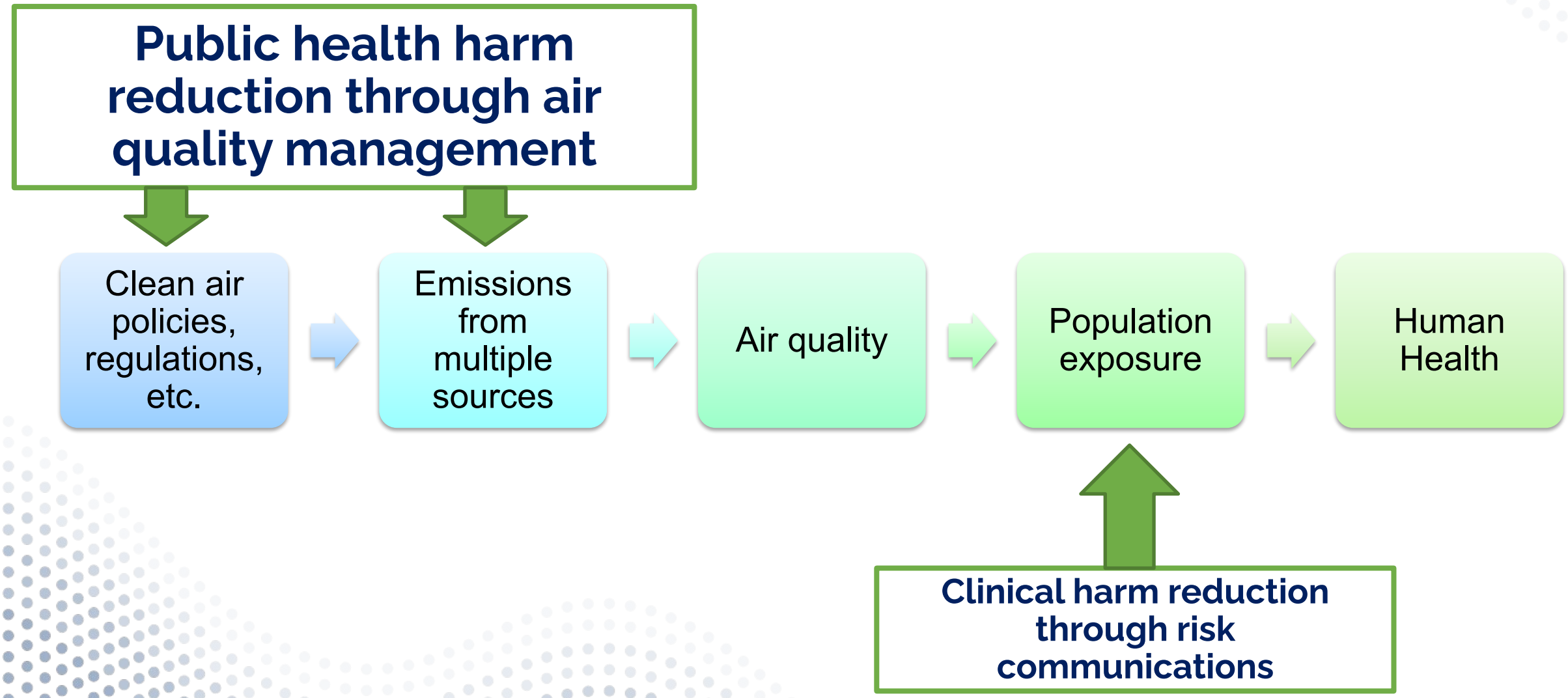
Comprehensive Vehicle Pollution Control Strategy





Between 1997 and 2016, the annual average of PM_{10} concentration reduced from 90 ug/m^3 to 49 ug/m^3

Clinical solutions are limited; public health solutions are required



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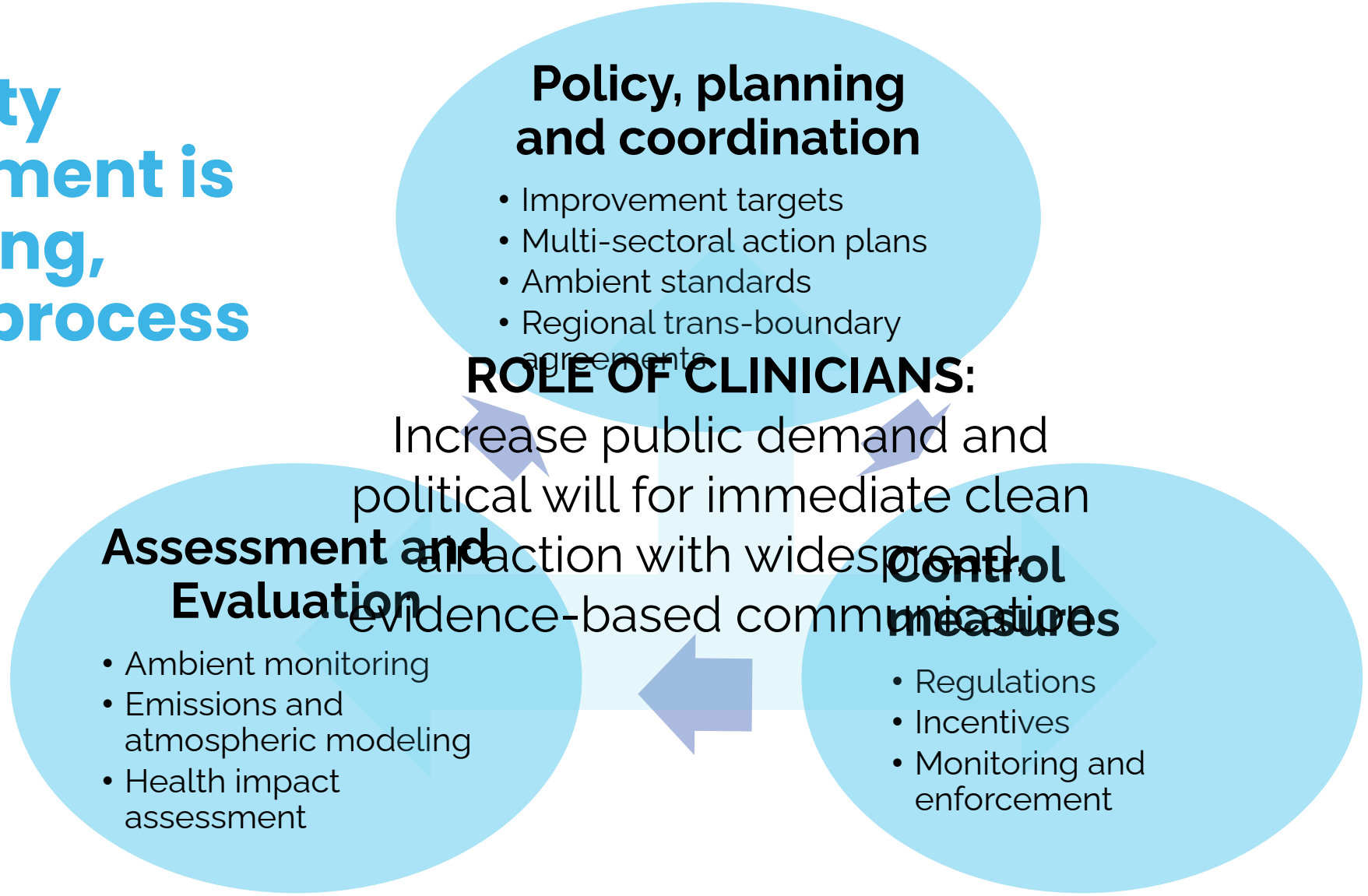
Air Quality Management is an ongoing, cyclical process



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Key Takeaways

- Strategic **medical management can dampen the harm** that air pollution inflicts on sensitive or vulnerable patients.
- Clinical guidance to protect human health from the health risks is tremendously **limited**.
- **Public health solutions** that reduce emissions at their source produce the most sustainable gains for health.

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Patient Guidance Exercise

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Thank You

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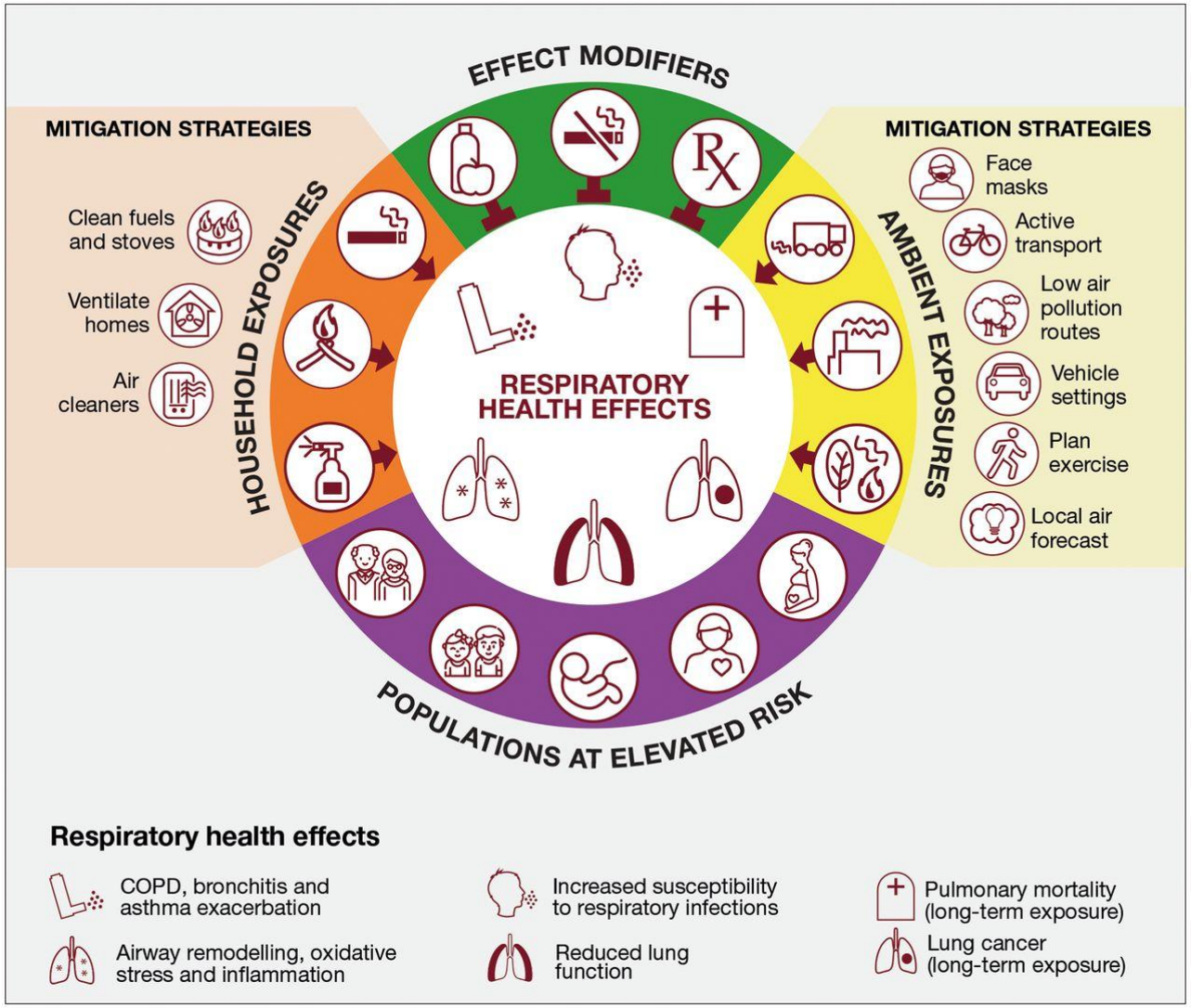
Key elements in mitigating air pollution exposure and protecting respiratory health.



Christopher Carlsten et al. Eur Respir J 2020;55:1902056

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