Transforming the physical environment that shapes young children's health and development: the role of policies and partnerships.

An Action Agenda

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Global Environmental Health Policy Expert
Former Coordinator WHO Health and Environment

This introduction

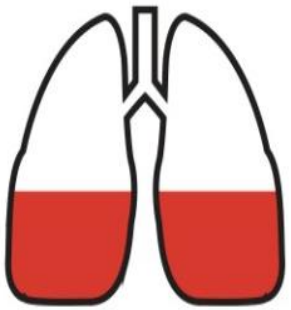
- Why the physical environment matters for ECD
- What are the risks and opportunities in the physical environment that create nurturing care for young children
- What are nurturing and sustainable environmental contexts/that support ECD and what are the public policies and interventions that can create/ enable those nurturing and sustainable environmental contexts?
- What are examples of good practice of successful multi-sectoral cooperation/programs and interventions
- How this network can can ensure young children in this region have access to and can thrive though safe and healthy nurturing physical environments.

How the Physical Environment is central to Early Childhood Development

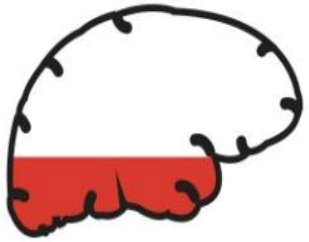
AIR POLLUTION
including indoors and outdoors

THE INVISIBLE KILLER

Air pollution may not always be visible, but it can be deadly.



36%
OF DEATHS FROM
LUNG CANCER

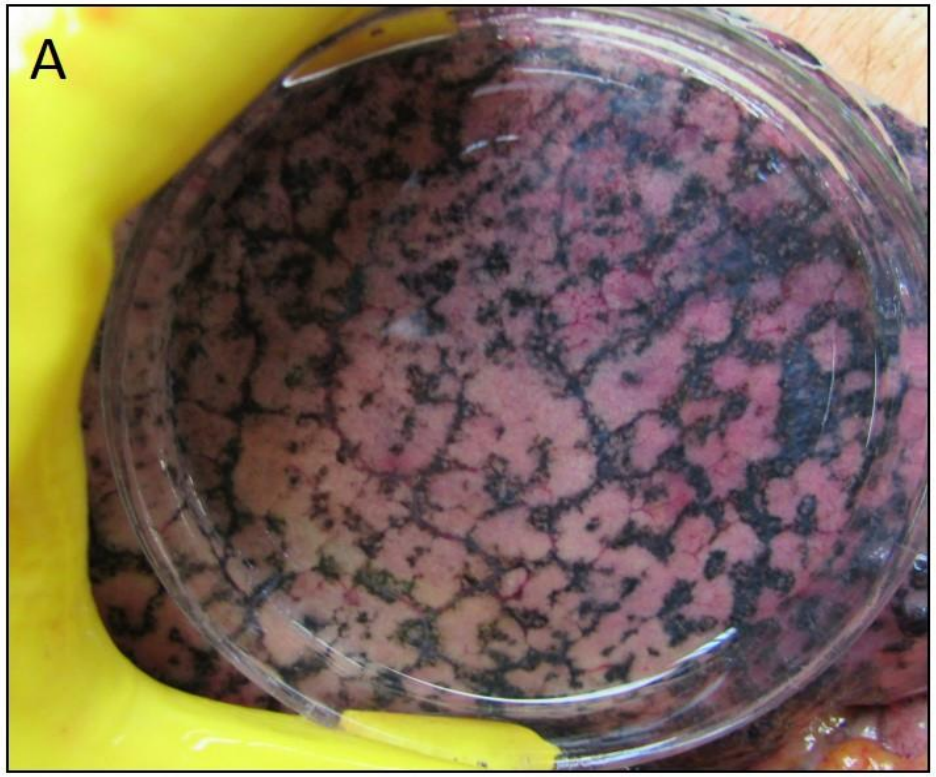


34%
OF DEATHS FROM
STROKE

27%
OF DEATHS FROM
HEART DISEASE

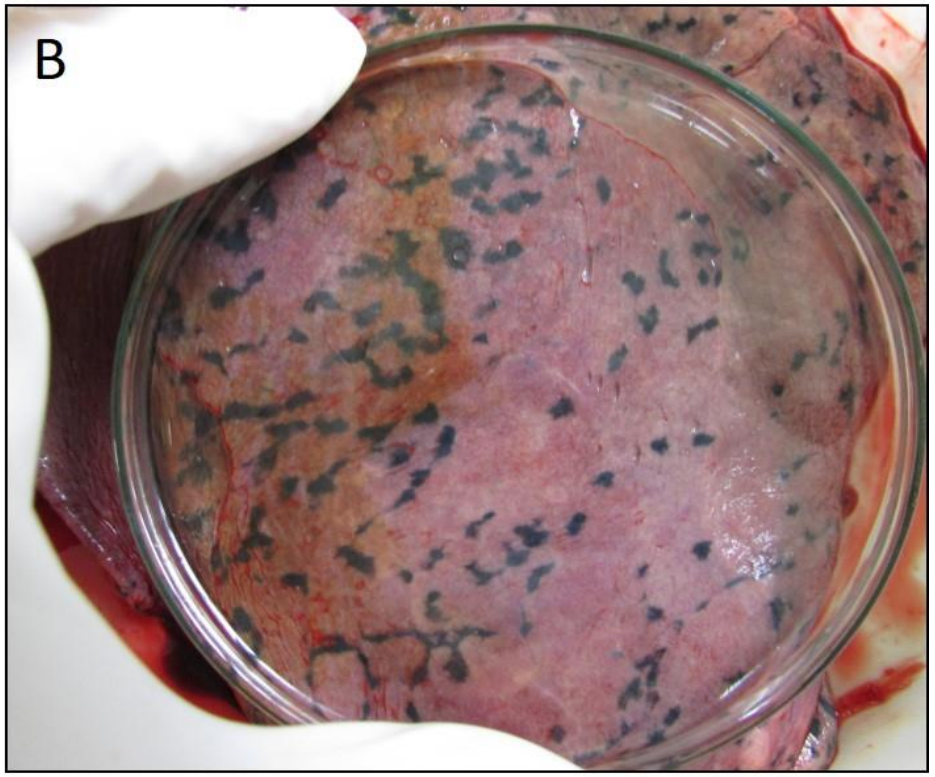
Soot in lungs – in a smoker and a non-smoker in Sao Paulo, Brazil

Smoker



FA = 0.48

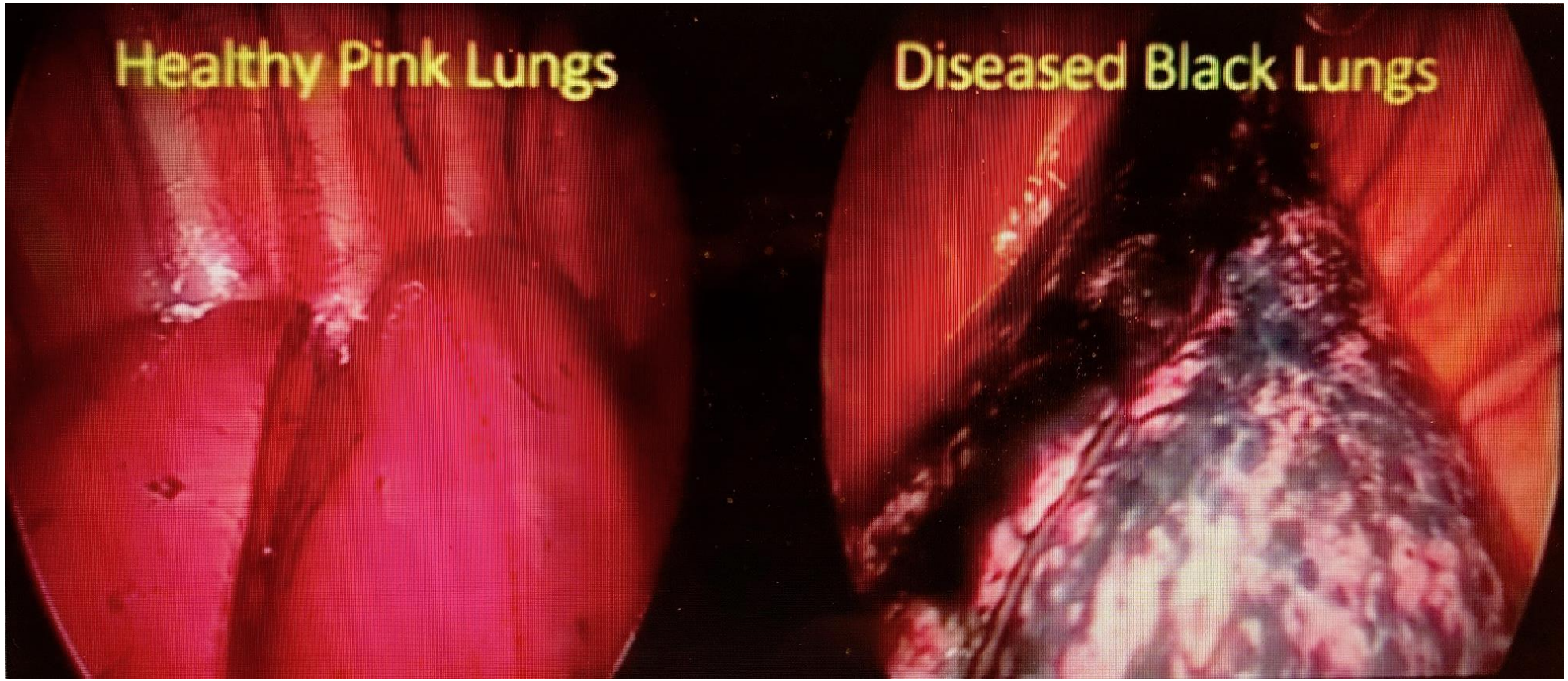
Non-smoker



FA = 0.19

Prof. Paulo Saldiva, Pathologist and Epidemiologist, Sao Paulo, Brazil

A healthy lung (left) and a lung of a non-smoker living in Delhi



Dr Kumar, Chest Surgeon, Lung Care Foundation, India
www.lcf.org.in

Lung of an adolescent born and raised in Delhi

Dr Kumar, Chest Surgeon, Lung Care Foundation, India. www.lcf.org.in

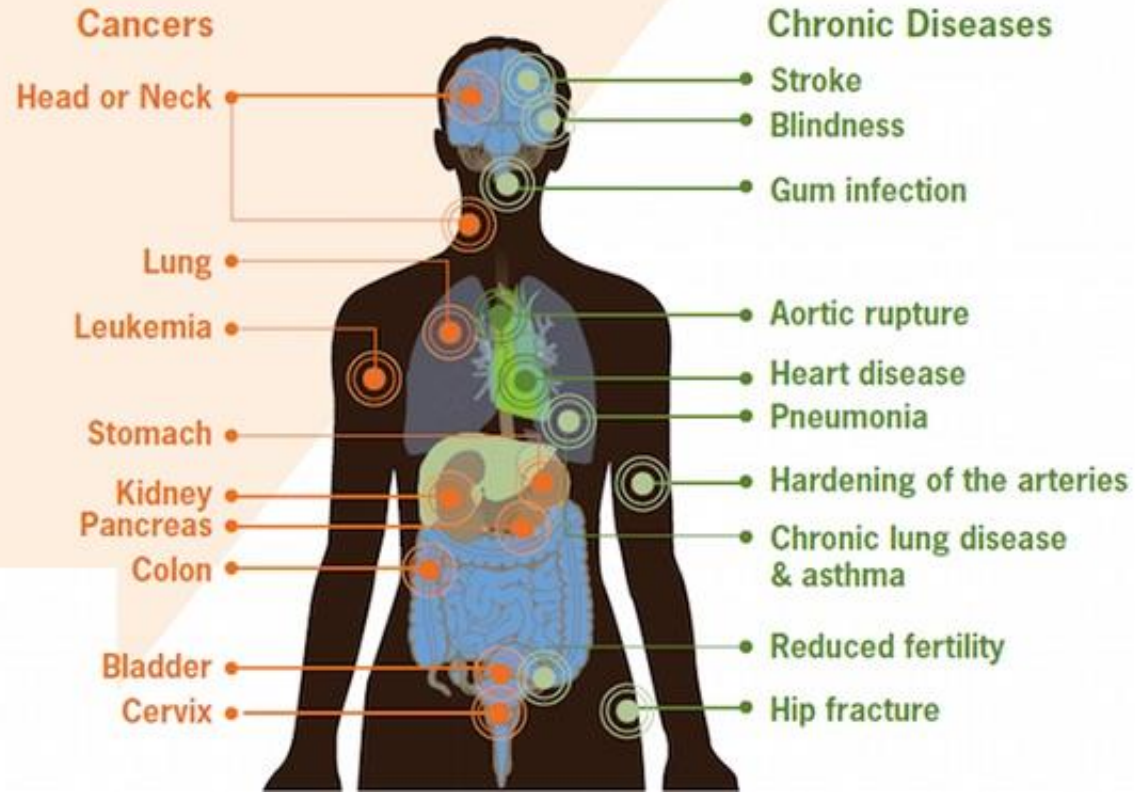
Un grand probleme pour la santé

7 million deaths from smoking

7 million deaths from Air Pollution

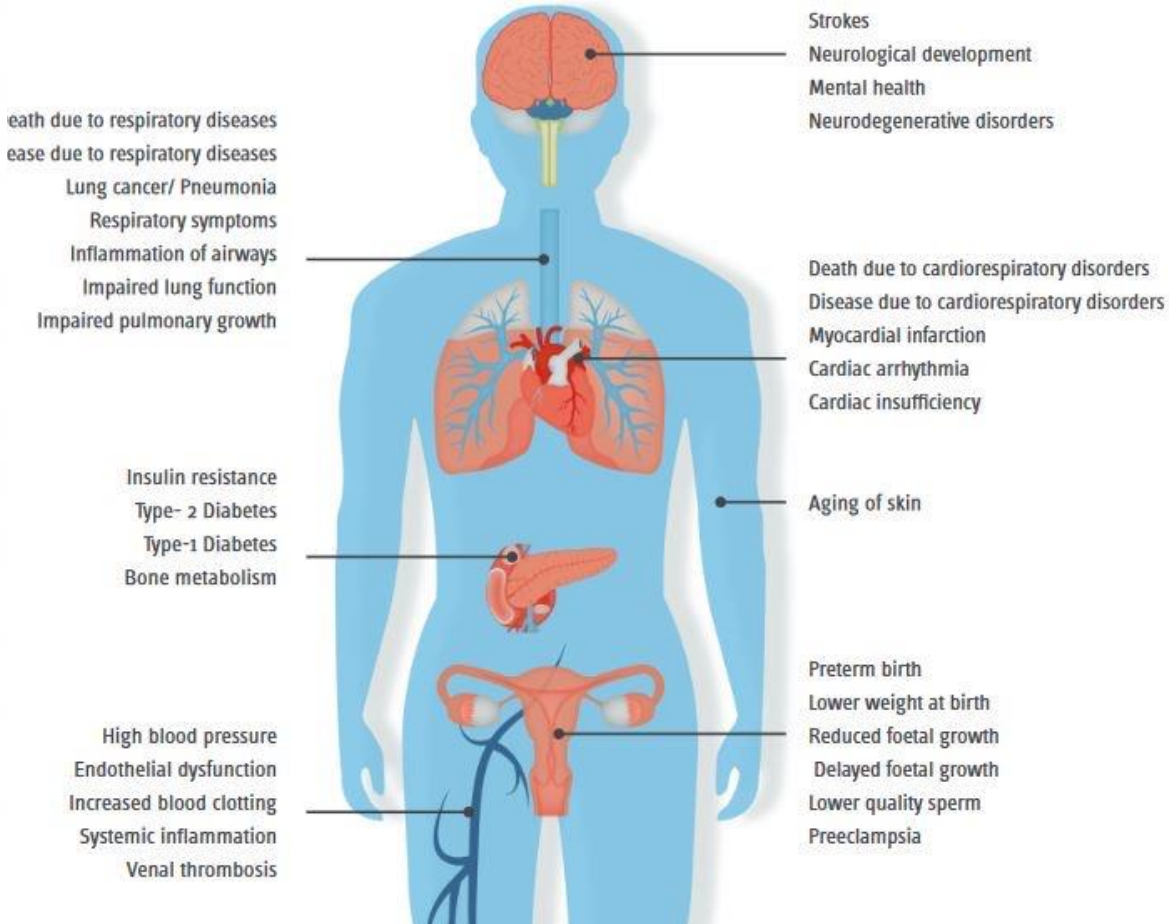
Risks from Smoking

Smoking can damage every part of the body



Risks from Air Pollution

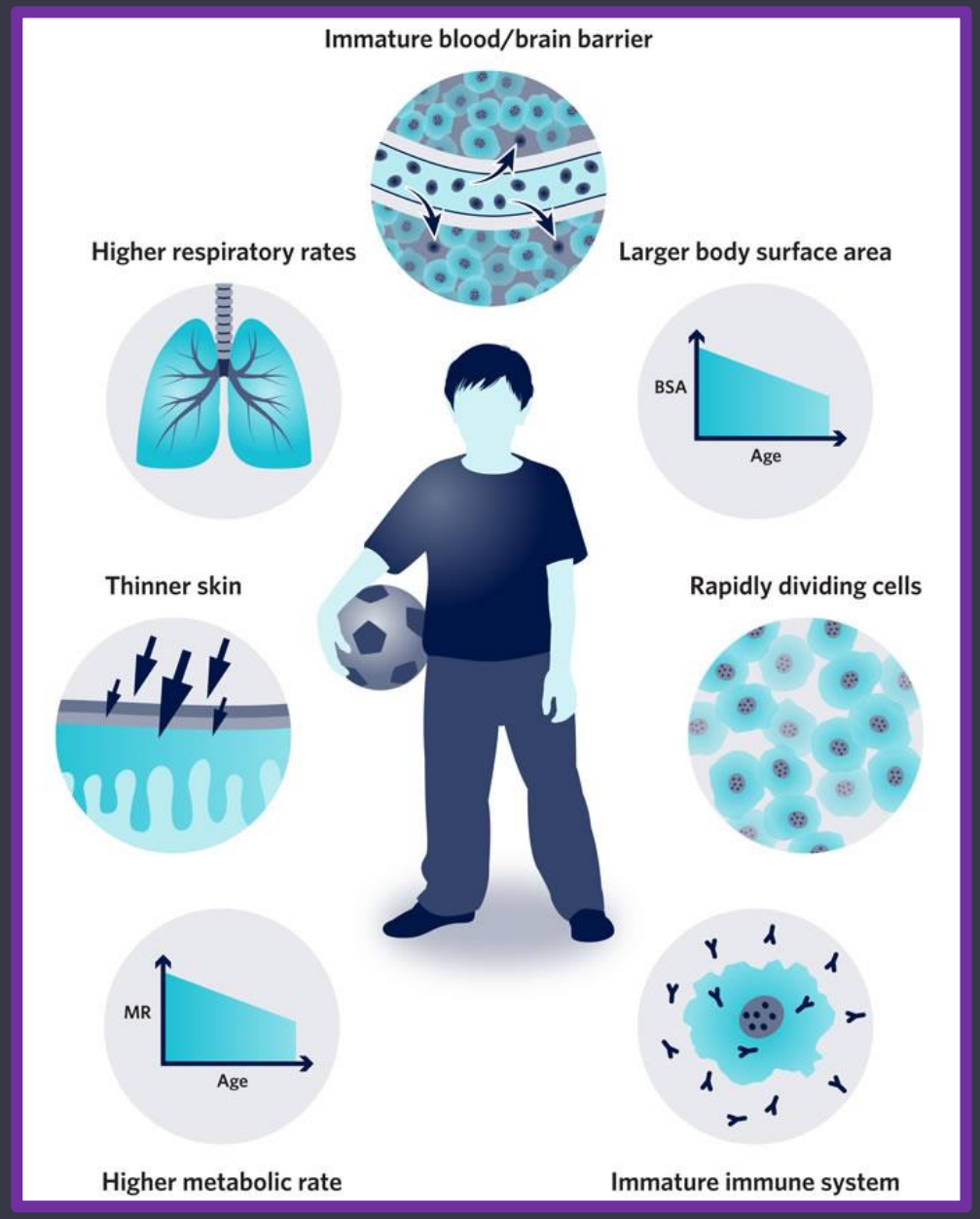
Air Pollution can damage every part of the body



Children are not small adults

Children are at greater risk of bearing negative health effects from exposure sto environmental hazards:

- Children's developing organ systems are more vulnerable to damage from exposures.
- Children are less able than adults to detoxify and excrete chemicals to which they have been exposed.
- Children's exposures are greater kilo-for-kilo than those of adults.
- Children have more years of future life in which to develop disease triggered by early exposure.



Source: Population Refernce Bureau 2012; Hernandez-Avila, 2002

Children's exposures are greater kilo-for-kilo than those of adults

Air inhalation

3 to 1

Soil/dust consumption

3 to 1

Drinking water

2.2 to 1

Dietary fat intake

3.4 to 1

Fruit & vegetable

1.7 to 1

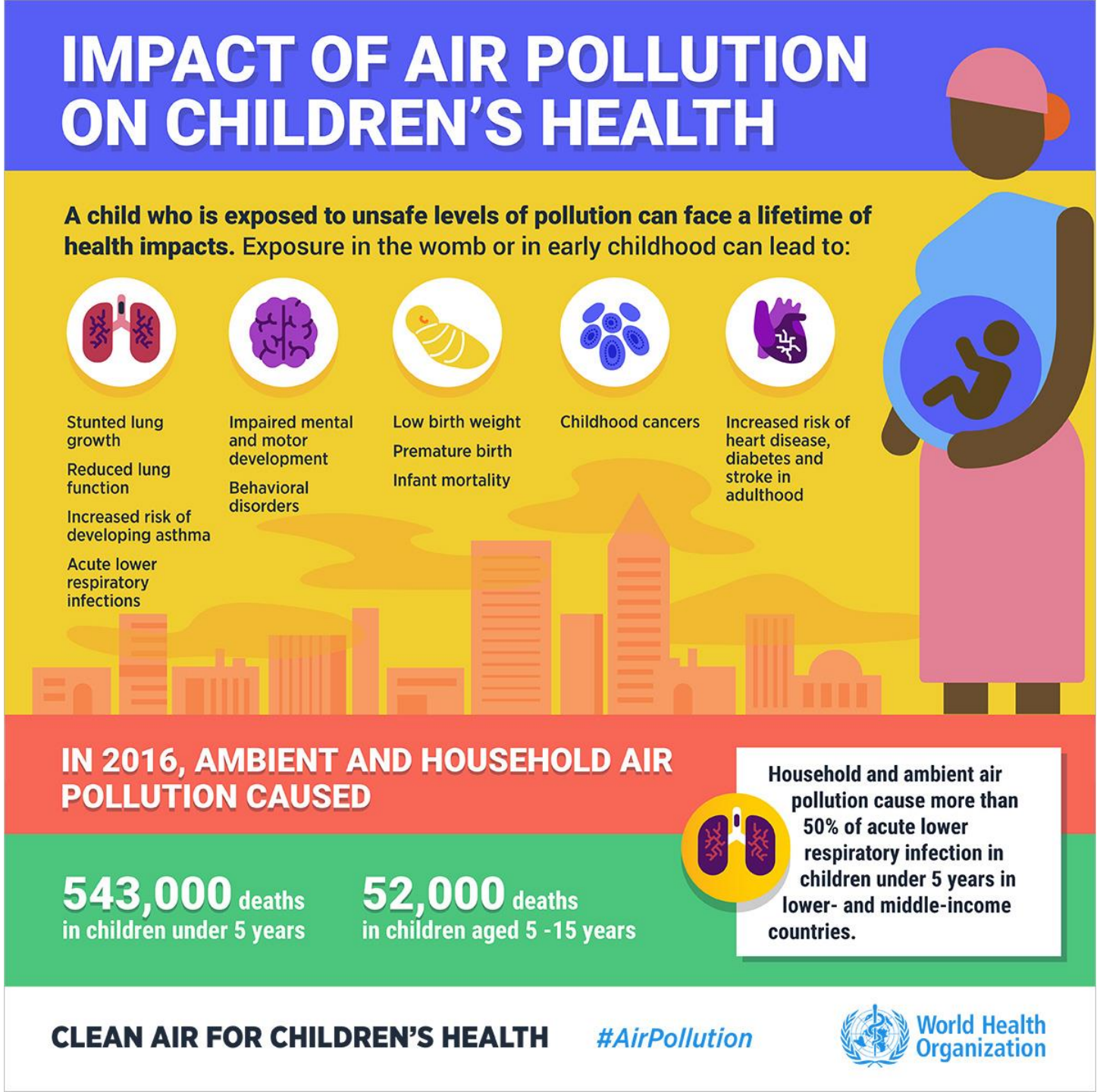
Source: Environmental Protection Agency (EPA). 2002. Child-Spec

Outdoor AP affects children:

Outdoor AP causes 5% of child deaths under age 5 , or 18% of Years of Life Lost

Twice the risk of life lost than the remaining population

Lelieveld et al. The Lancet, 2018



543,000 deaths a year under age 5

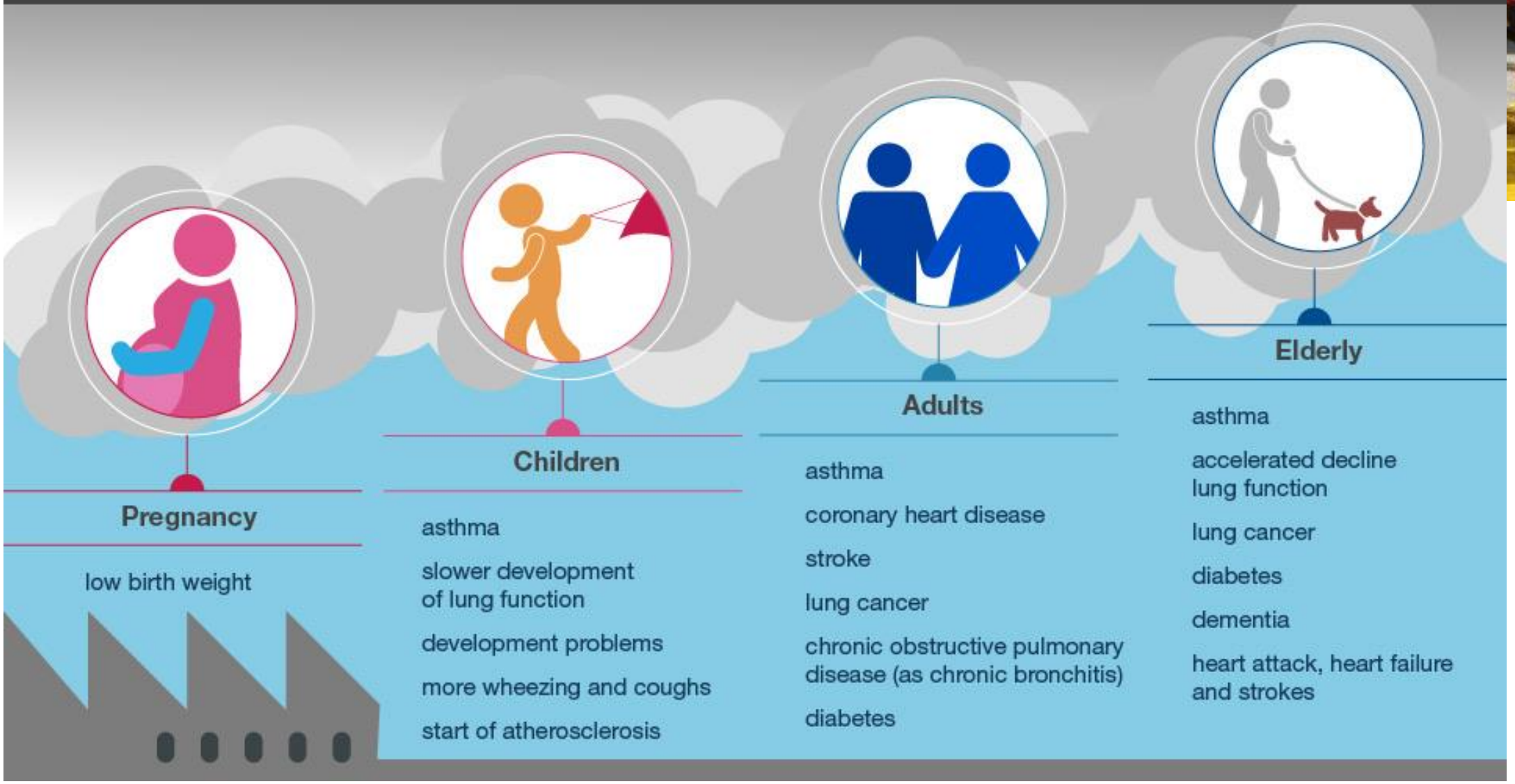
Outdoor air pollution:

Lung development and capacity

Risk of developing asthma

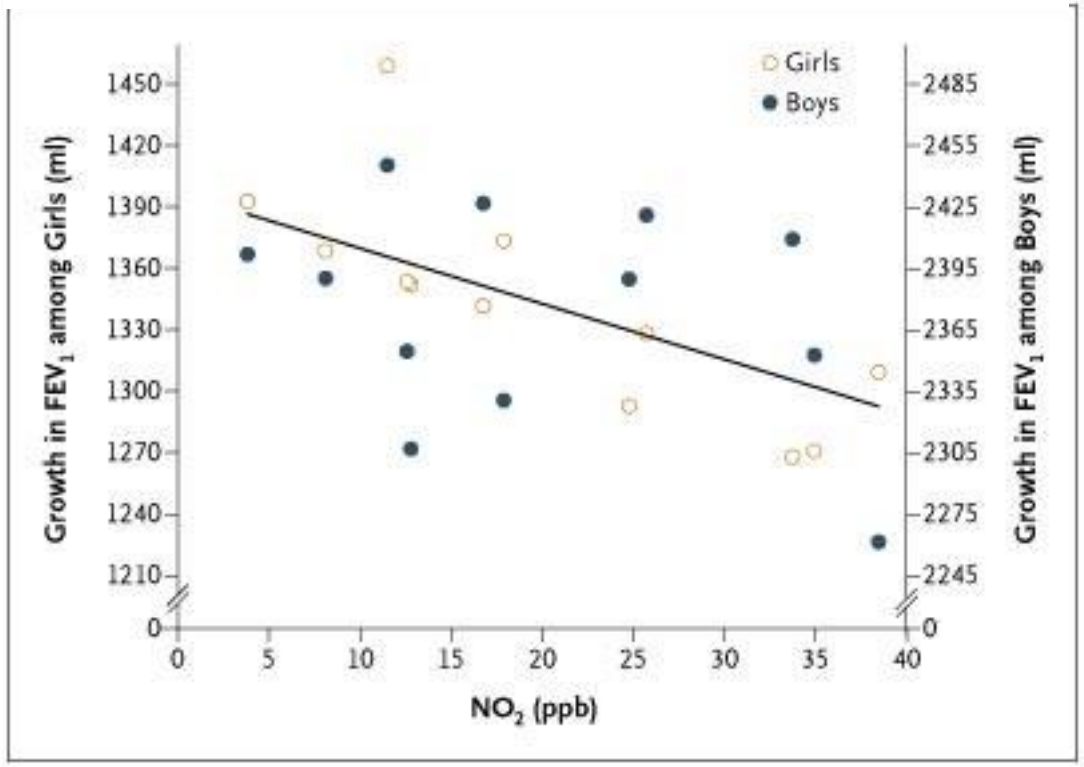
Reversed when moved into clear air areas

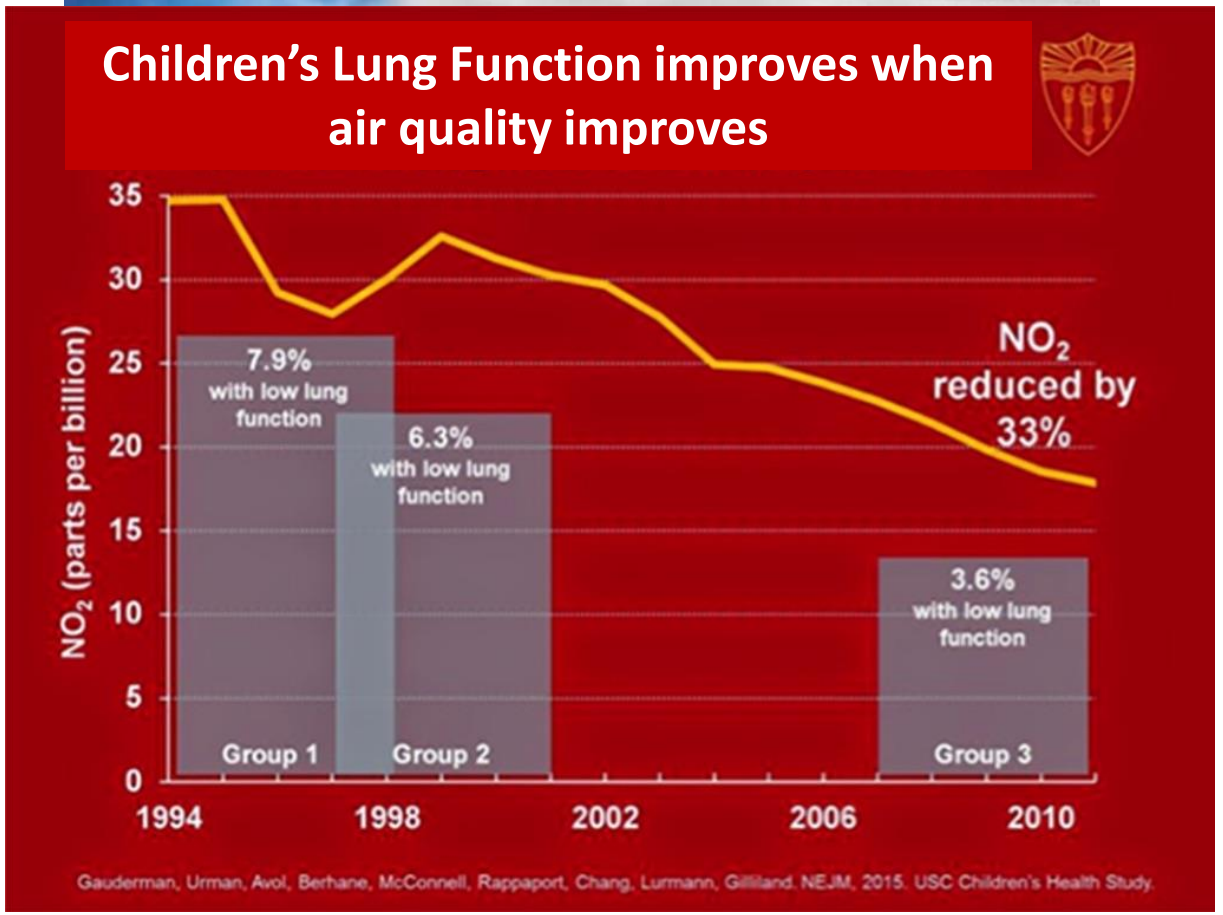
Air Pollution affects people's health across their lives



Children's Lung Function and Air Pollution

Lower Lung Function in places with more Pollution





Air pollution is the result of combustion of fuels like wood, charcoal, coal, and petrol, for transport, industry, cooking or heating/cooling buildings, or burning domestic or agricultural waste

Cooking, heating and lighting with wood, coal or kerosene – the largest source of AP for small children

Dirty household fuels and technologies for cooking, lighting and heating cause

- Indoor air pollution
- Burns from fires,
- Intoxication from kerosene use
- Time use by children in homes using polluting fuels 15hs vs 5 hs

Agriculture waste and solid waste burning

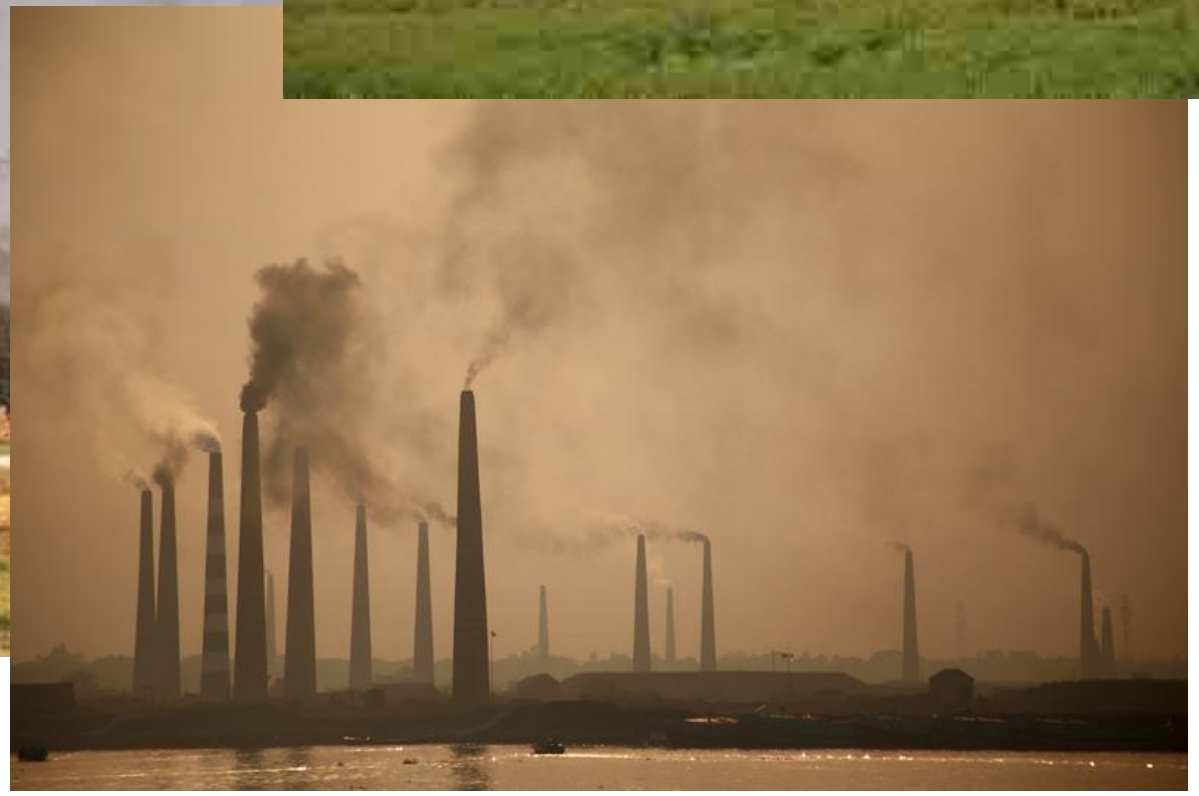
Transport

Coal fired power plants and industry

Port cities – emissions from ship's dirty diesel

A single cruise liner berthed at a passenger terminal can emit as much sulphur dioxide as 25,000 diesel buses

Brick Kilns



Air Pollution affects most people, 90% of the world's population.
we share the air, there is not clean air in bottles

Other environment risks affect specific groups of children

Artisanal mining – contamination by health metals

children, families living and working near mines e.g. mercury used in goldmining.

Damage the brain and nervous system, affects of cognition, memory, attention, language, motor skills

Lead in Paint – damages IQ, behavior, cardiovascular

Electronic waste – heavy metals, small business involved in recycling not aware of risks from contamination (e.g. through skin)

CLIMATE CHANGE

Global threat:
Consequences to child health now
Increasing dramatically in the future

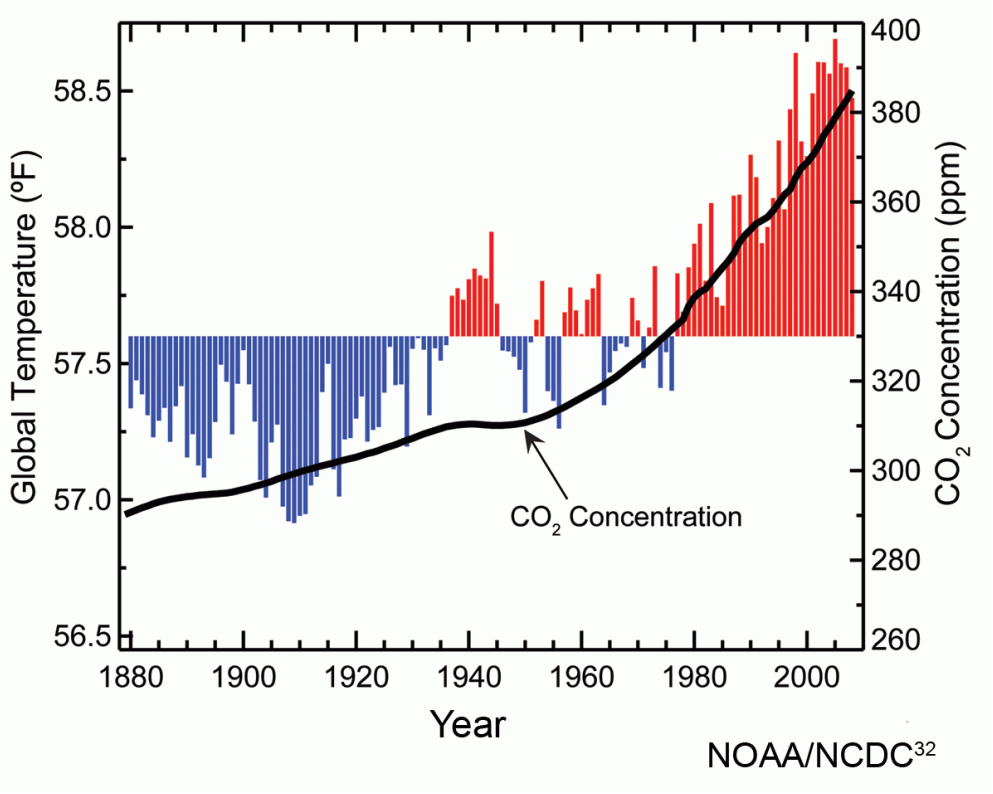


250 000 additional deaths per year between 2030 and 2050 without mitigation and adaptation

1. **Direct effects of floods, droughts, heatwaves, forest fires**
2. **Increase in infectious and vector-borne diseases**
3. **Impacts on social systems, migration and conflict**

AP and climate change:
Common causes & additional impacts

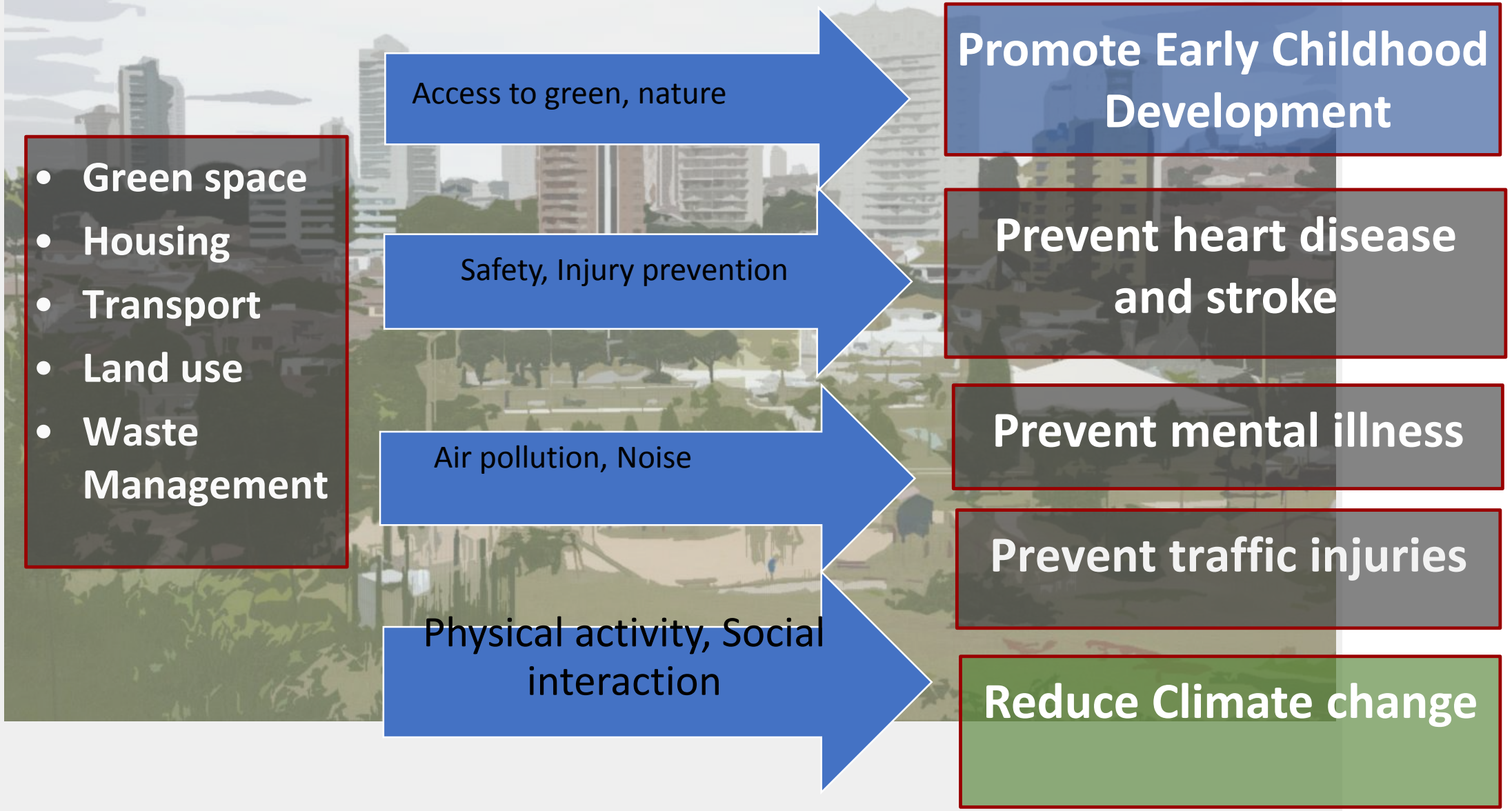
Climate change impacts are global, long term and catastrophic, affecting people across the globe



Air pollution impacts are local, short and long term. Those near the polluter are directly affected by the pollution.

Solutions & synergies with ECD

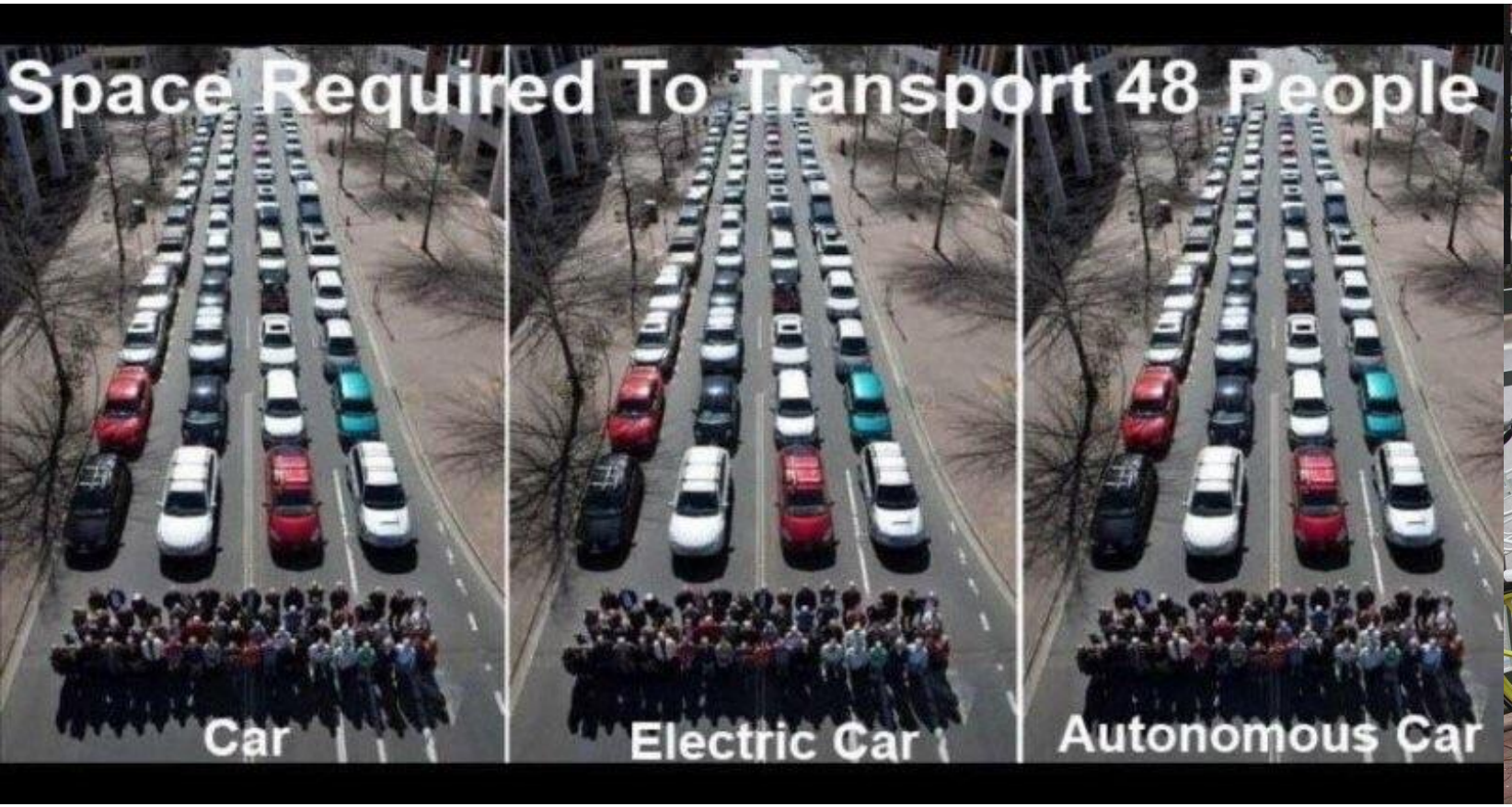
Solutions with synergies: Urban policies that prevent diseases, reduce climate change and promote ECD



Health co-benefits

Health co-benefits from transport policies

Do E-vehicles & Autonomous vehicles bring health?
Buses and bicycles vs E-cars



Sustainable transport health benefits

walking, cycling and public transport

Not only from fuels and engines

- Reduce air pollution and Noise
- Increases physical activity
- Reduces traffic injury
- Reduces noise
- Frees urban road/parking for green /public space
- Facilitates more equitable access to goods and services
- Eases movements of older people, children, disabled, women
- Promotes social cohesion in local communities

Getting the transport sectors to take up cycling and walking as part of their agenda

Sedentarism: 3,2 million deaths a year

30 minutes daily of active travel (cycling & walking) is enough to make a difference for healthReduce risk of coronary heart disease – by 50%

- Reduce risk of non-insulin-dependent diabetes and obesity – by 50%
- Reduce hypertension risk – by 30%.
- Reduce colon and breast cancer (50% reduction in colon cancer in long-term Shanghai study)
- Help maintain bone mass and protect against osteoporosis
- Improve balance, coordination, mobility, strength and endurance
- Increase self-esteem, reducing levels of mild to moderate hypertension and promote overall psychological well-being.


Need for robust measures
Big isues at stake, e.g. redistribute street space

Access to public and green spaces

- Can be used to separate emission sources
  - Highways and transport corridors from sensitive receptor groups
- Trees and vegetation absorb some air pollution and capture GHGs
- Shady areas can reduce the "heat-island" effect in urban areas
- Green spaces have important psychosocial and health benefits
  - Important social and recreational spaces

Mental ill health costs 4% of GDP

Urban planning & design improves & protects mental health

Protective factors:

- Space for exercise/ physical activity
- Access to green space and to nature
- Places that encourage social interaction
- Safety in the city
- Low noise, good sleep/learning at school
- Clean air
- Warm homes

Health co-benefits in home energy

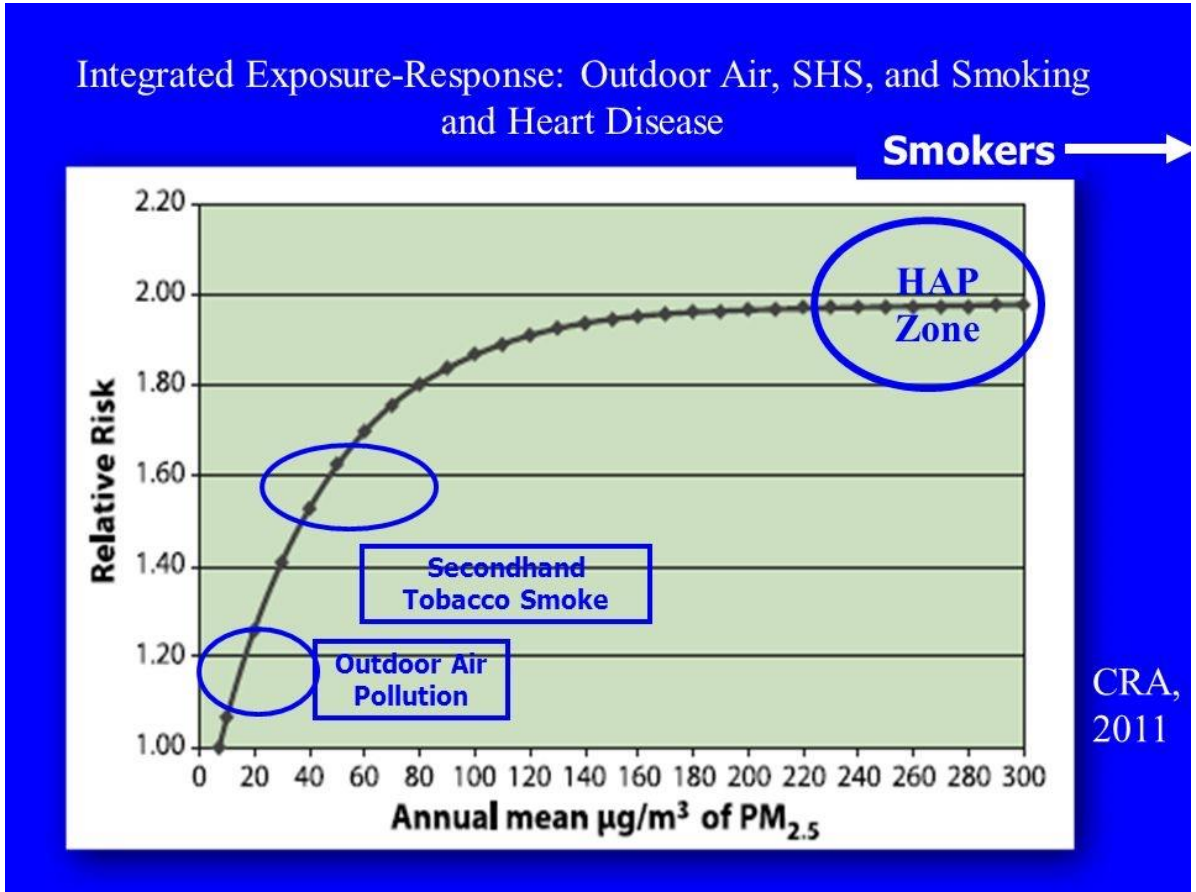
Light a billion lives – solar substitutes kerosene, India

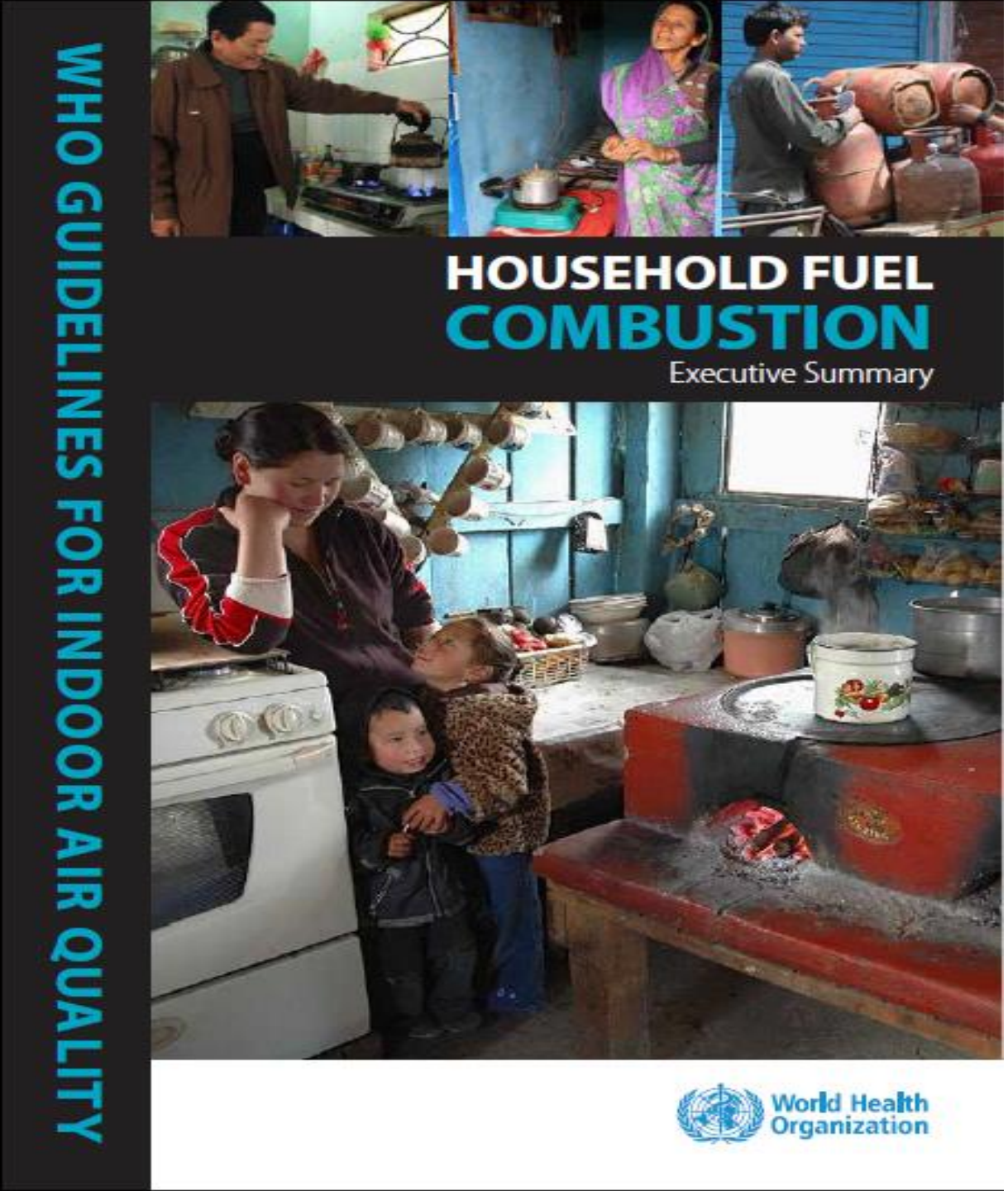
Solar hot water heating is an fast-growing, popular technology in Turkey, China, South Africa, Middle East, etc.

China is mass marketing next-generation solar PV & passive. Below passive solar "combi" hot water space heating raised night-time winter temperatures from 6-8º C lows in village near Beijing

The myth that simple technology improvements would tackle IAP

- Locally build
- Create local markets and small businesses
- Did help reduce deforestation
- Did reduce IAP a bit, but
- Not nearly enough to produce health benefits!
- Not “clean cookstoves” but “clean cooking”





Indoor Air Quality Guidelines:

for fuels and technologies used for cooking, heating and lighting in the home:

1. Don't use Kerosene
2. Don't use Coal
3. Use only very efficient cookstoves (following emission rates provided by WHO)
4. Use clean fuels in the transition LPG, Biogas, ethanol…

Housing regulation to include health criteria
WHO Housing and Health Guidelines has the science – need for model regulation and a label for Healthy Housing

Housing risks

- Indoor/outdoor air pollution
- Damp, mould & allergens
- Poor indoor ventilation
- Indoor temperatures
- Access to sustainable transport
- Urban waste, sanitation & water
- Heat Island
- Storms/flooding

Health impacts

- Chronic/acute respiratory disease
- Allergies, respiratory disease
- Respiratory disease
- Physical inactivity, NCDs, traffic injuries
- Water and sanitation-borne disease
- Strokes
- Injuries/poverty




Health co-benefits

Housing that is energy-efficient and good for health

« Improved insulation saved 0.26 months of life per person » (UK Warm Front Programme)

« Reduced wheezing, days-off school, doctors' visits were reported by occupants of insulated homes « (NZ Insulation study)

Reduction of respiratory illness by 9% to 20% and increase of individual productivity between 0.48% and 11% with natural ventilation startegies

Health co-benefits in housing

Energy-efficient heating, cooling and natural ventilation can reduce strokes and respiratory illness as well as TB and vector-borne diseases;

A focus on slums /sub-standard housing - where needs are greatest/benefits could be multiplied

Solar hot water heating - India

Cape Town, South Africa's Kuyasa neighborhood slum upgrade

Low emission zones around schools

Transport related UF AP in and nearby schools: associated with lower cognition, poor working memory, and ADHD

Environment International 121 (2018) 199–206

Contents lists available at ScienceDirect

Environment International

journal homepage: www.elsevier.com/locate/envint

How to protect school children from the neurodevelopmental harms of air pollution by interventions in the school environment in the urban context

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ARTICLE INFO

Handling Editor: Adrian Covaci

Keywords:
Particulate matter
Air quality

ABSTRACT

Recently, there has been a flurry of publications assessing the effect of air poll
we present a summary of the results obtained within the BRain dEvelopment and Air
ticles in scHool childrEn (BREATHE) Project, which aimed to evaluate the effects of the expo
related air pollutants in schoolchildren in Barcelona. To this end, we comprehensively characterised air quality

- Reduce traffic and increase green areas in school surroundings
- Move schools away from traffic
- Promote active travel to school

Access to clean energy: alternative to polluting coal & diesel generators

Access to clean/sustainable energy in Health Care

- Energy efficient medical technologies
- Substitute diesel generators for sustainable sources (solar, hydro…)
- Access to sustainable transport
- Energy efficient buildings …

Solar suitcase powering a health care facility in Nigeria.

Solar powered refrigerator in Vietnam.

Need for Health in All Policies (HiAP):

- To tackle a wide range of determinants of health, in particular the social, political and commercial determinants of health
- To manage complexity, promote equity
- Collaborative and participatory approaches to governance and policy making
- Involvement of many stakeholders
- New formal and sustained mechanisms for intergovernmental integration
- Commitment to and mechanisms for accountability

Approaches to intersectoral action, some examples

1. **Methods** - Health impact assessment, CBA, needs assessment
2. **Policy domains** with urban jurisdiction: transport, housing, land use planning, water, waste, education, health
3. **Governance & opportunities** to influence investments and behaviour in the direction of health and health equity.

Examples of influencing sector policies to protect & promote health

1. Environment litigation/raise issue in political agenda
2. Aahurs convention - access to information public participation, access to env. Justice
3. Development banks safeguards
4. Codes of practice for businesses
5. Multilateral Environment Agreements – Chemical Conventions Basel, Rotterdam, Stockholm,
6. Regional inter-ministerial processes – Europe, Asia, Africa

Examples from civil society: What did work

- Technology based standards for all major categories of pollution sources. (MACT, BAT)
- Information disclosure (Toxic Release Inventory)
- Public ownership and operation of treatment plants
- Liability for pollution and harm
- Citizen enforcement law suits
- Toxic torts instead (common law)
  - Challenging burden of proof:
    - preponderance of the evidence for exposure, and
    - causation: show that each pollutant can and did cause specific injury to a specific individual

Include health protection into sectors: Governance mechanisms

National policy frameworks	• Development plans, Poverty Reduction Strategies and Plans (PRSPs) • Sector strategies (health, energy, transport, housing, agriculture)
Rules & regulations	• Litigation (e.g. polluter pays, class action) • Permit and licensing requirements • Grievance mechanisms/ombudsperson
Economic instruments	• Incentives (e.g. tax, subsidies) • Penalties (e.g. fines, lending conditionality)
Planning tools	• Impact assessment processes (e.g. health, social, environmental) • Economic assessment (cost benefits, cost effectiveness)
Democratic instruments	• Functioning Civil Society Organizations • Stakeholder engagement and public participation processes • Free mass media, access to information, to internet
Institutional capacity for action	• Structures, designated individuals/groups • Procedures/processes and related resources (e.g. human, financial) • Internal capacity & mechanisms for further capacity development
Monitoring and performance mechanisms	• Of health and development footprint of policies and investments • Of stakeholder views and perceptions • Of process itself, planning, implementation, follow-up, etc

Too much complexity?

If we don’t even have indicators of air quality can we afford to start integrating other aspects?

URBAN95

Bernard van Leer FOUNDATION

If you could visualize your city from a 95 cm height – the average for a 3 year old – what would you change?

Transportes y movilidad adaptado a ninos
(y a personas mayores, mujeres embarazadas…)

Bernard van Leer FOUNDATION

“Calles planeadas para que sean mas seguras y que lleven a menos stress”

Espacio publico, eventos de comunidade,

Project Crezco con mi barrio, Bogotá

It is possible! How to get there? Vision, leadership, incentives, regulation and cooperation

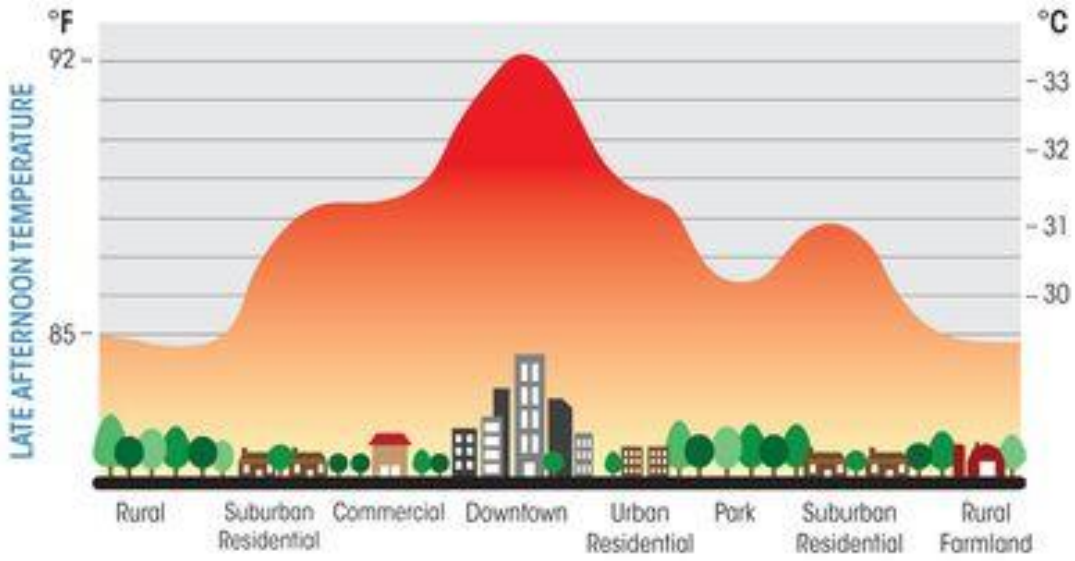
En Ile-de-France, l’usage de la voiture marque un recul historique

Une enquête montre que les trajets du quotidien en automobile ont diminué de 4,7 % dans la région par rapport à 2010. Une première depuis l’après-guerre.

Par Éric Béziat Publié le 13 novembre 2019 à 04h29 - Mis à jour le 13 novembre 2019 à 18h05

voiture » à Paris, le 22 septembre. DOMINIQUE FAGET / AFP

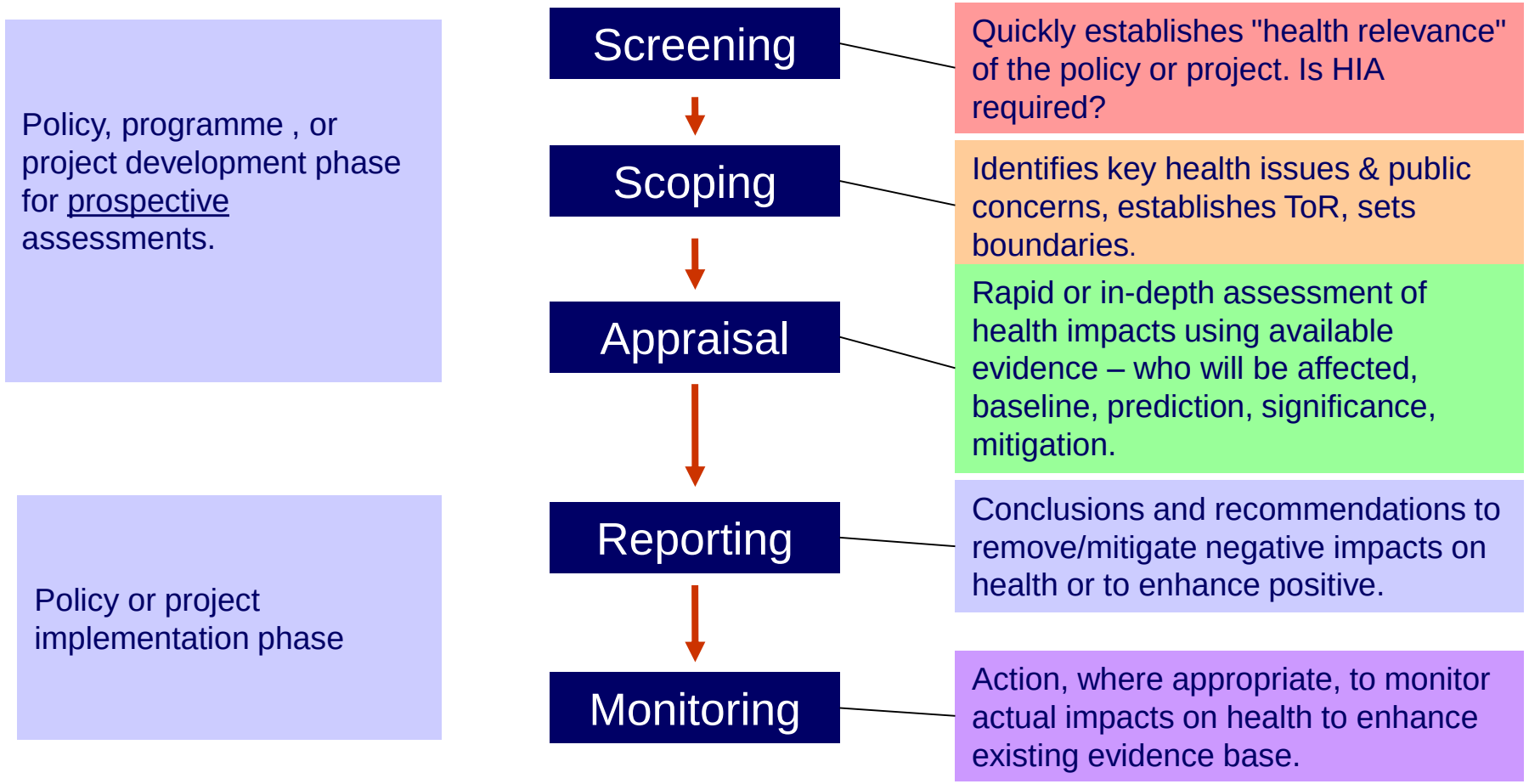
1. A vision that integrates cities, children, clean air, health and climate



2. Analysis: sources of pollution and health risk

New York 2% of buildings heating systems caused 50% of the pollution

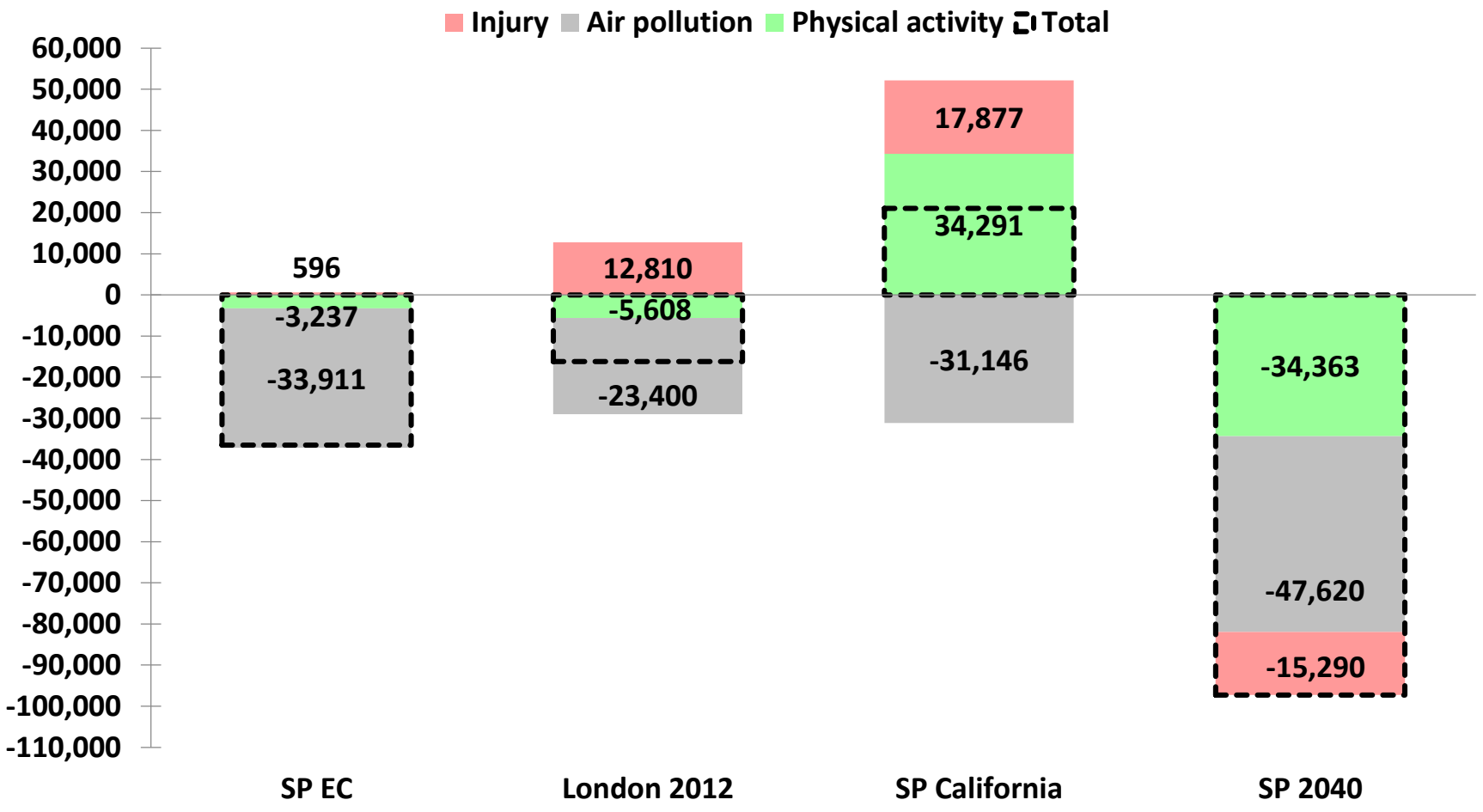
Local science to policy analysis: what are the expected health impacts from policy alternatives in your city?



Health Scenario analyses

Transport scenarios for Sao Paulo, Brazil:

Expected changes in DALYs attributable to changes from air quality, physical activity and road injuries



Sá et al. 2017

Analysis: Look at perceptions, engagement, justice

- Who is your audience?
- Focus on issues that people care, are concerned or enraged about.
- Personal, ethical and justice issues matter
- Co-productions of knowledge, stakeholder engagement is key to identifying the right solutions

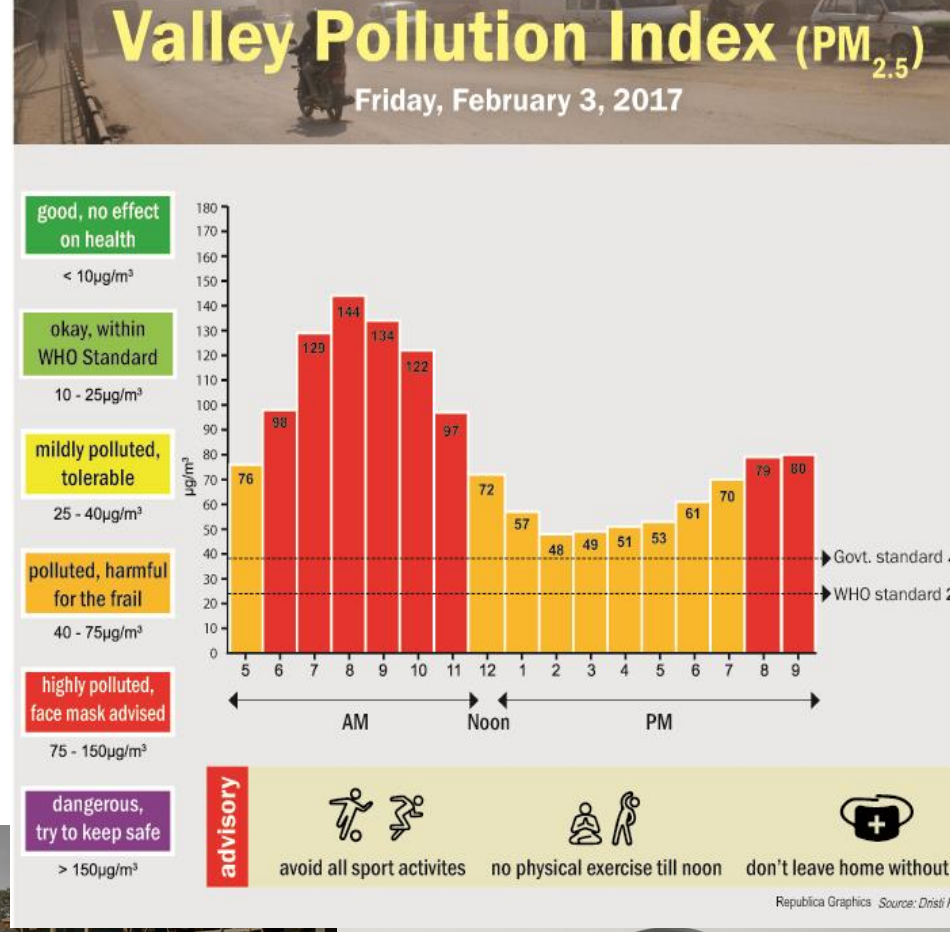
The risk of not taking account of context – system change solutions for those who will have to change their usual habits

Par example, eliminer les subsides pour le petrol aporte souvent de grandes oppositions si des solutions alternatives pour chaque groupe de la population ne sont pas anticipés

Citizen science

Portable air quality monitors being used by civil society and media

Monitoring of air quality does not depend on government alone



3. Look at existing knowledge and good practice

- Technology solutions, model legislation , business models (engage academia, schools, government, federation of industry & comerce).

- Disseminate that knowlegde, media, judiciary and educacional systems, professional associations, industry and comerce

- Promote local economic models, business and innovation for urban child health (transport, energy, housing, public space)

look at good practice

Pedestrianization in Istanbul

Pedestrianization of city's historic peninsula. (295 streets since 2010)

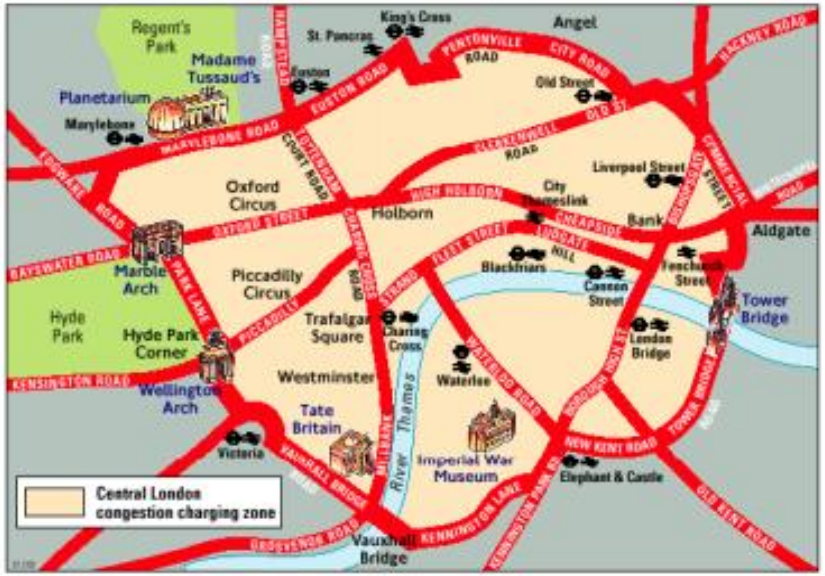
Air monitoring revealed NO2 levels declined by 42%. Communications potential.

Non-Motorized Transport in Chennai

First megacity in India to adopt a Non-Motorized Transport Policy

60 percent of transport budget is allocated to construct and maintain NMT infrastructure

Expected to have the largest public bike share system in India



London Low Emission Zone and congestion Charge

Sticker scheme bans older, more polluting vehicles from city during daytime hours.

Restrictions tighten each year, moving towards full petrol and diesel ban by 2030.

Other European cities following with diesel bans. Many cities with congestion charges

4

Facilitate public debate and demand for healthy public policies

Give voice and enable participaton of children

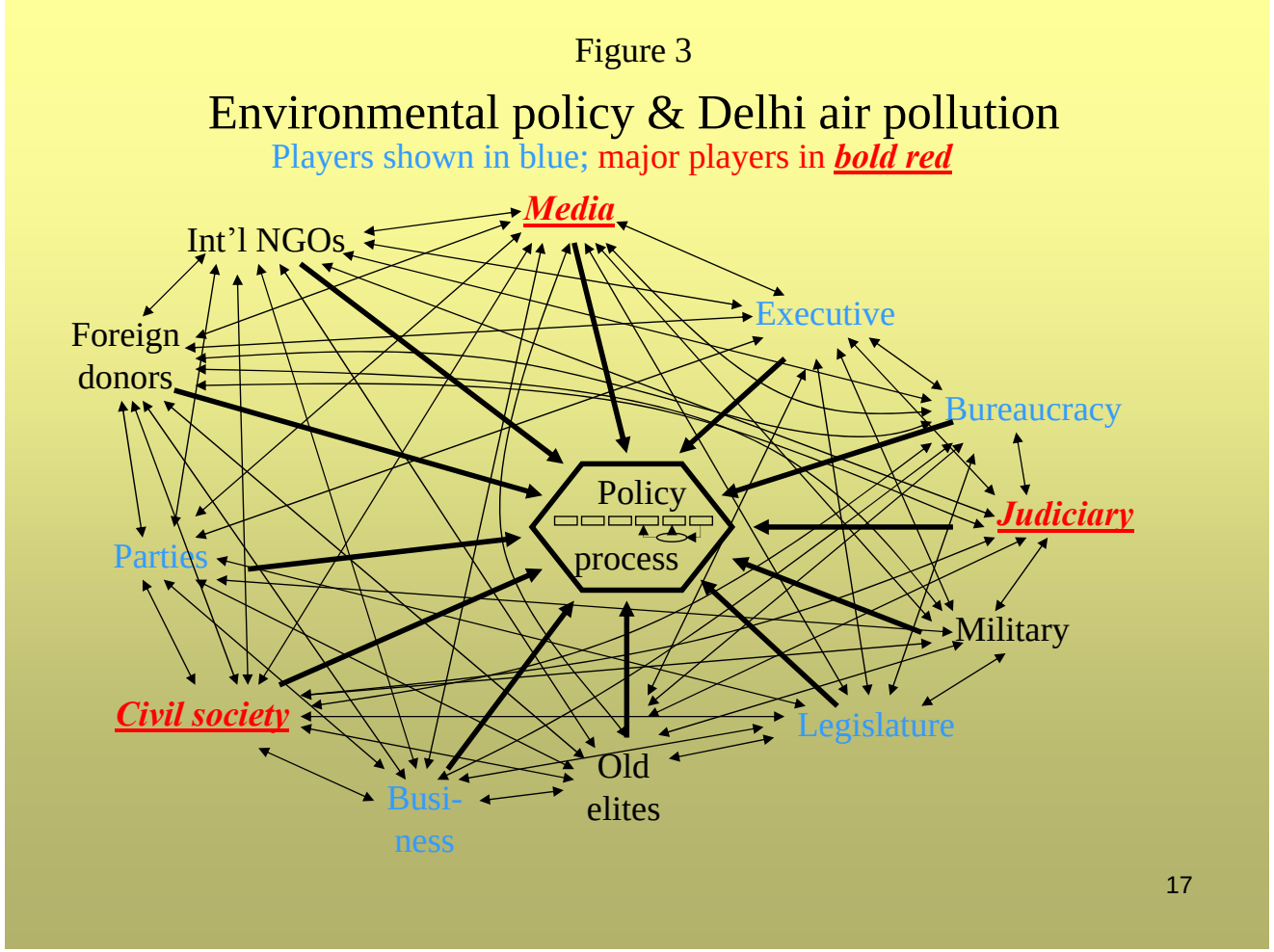
What type of city do we want?

Cities that support early childhood development

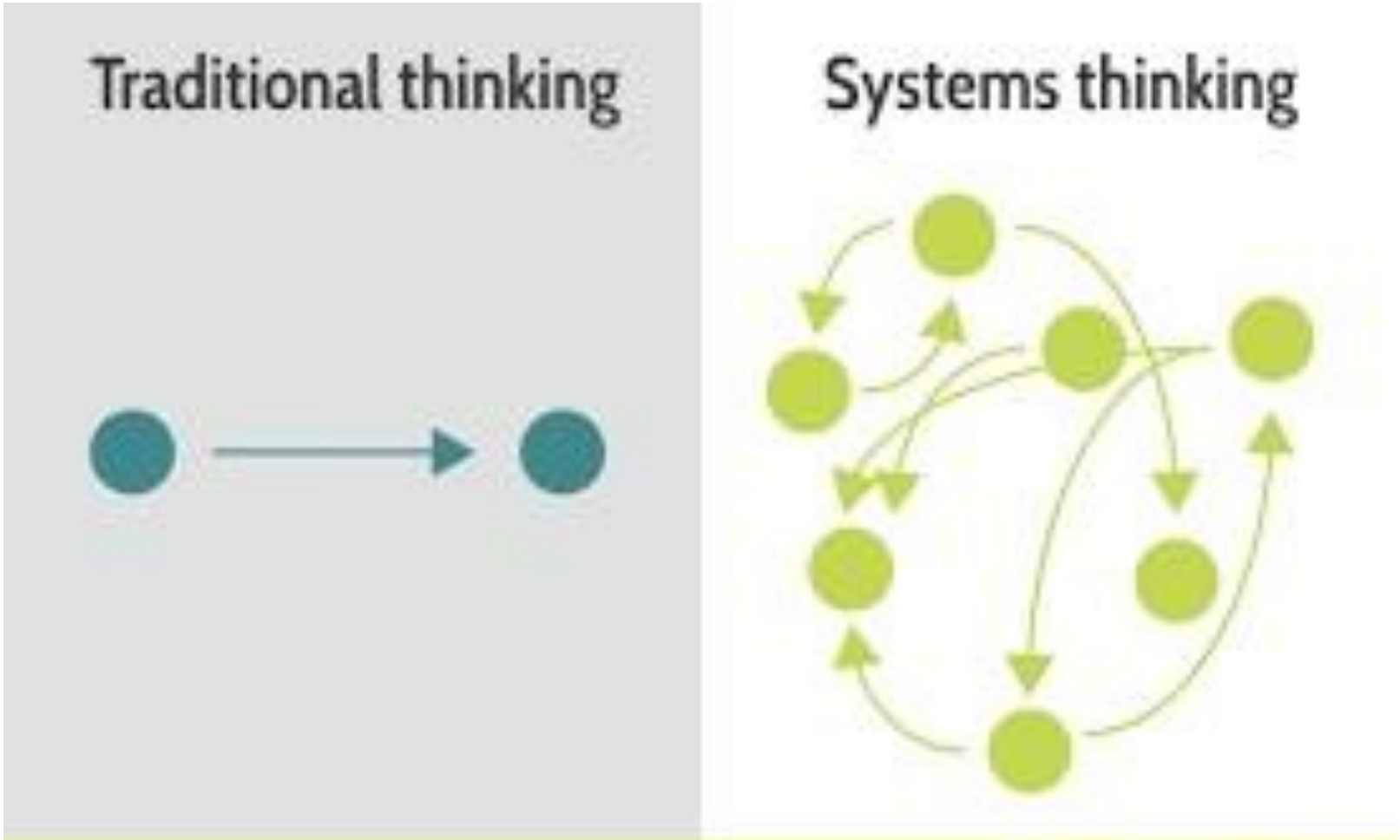
Places for play and social interaction

Places to explore and be in contact with nature

Avoid vertical interventions, look at the system

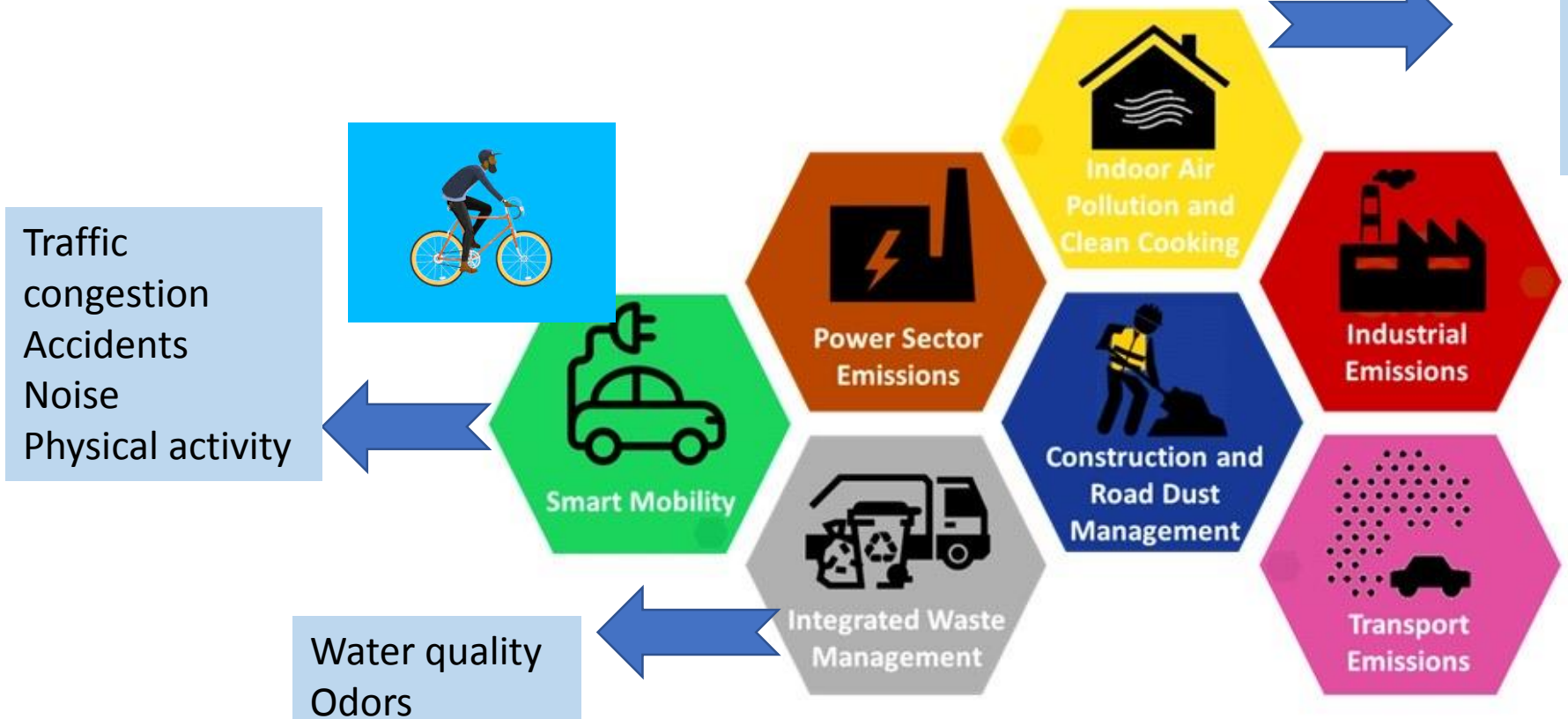


Structural transformations require engagement with politics, private interests, the public and behavioural change



Systemic perspective

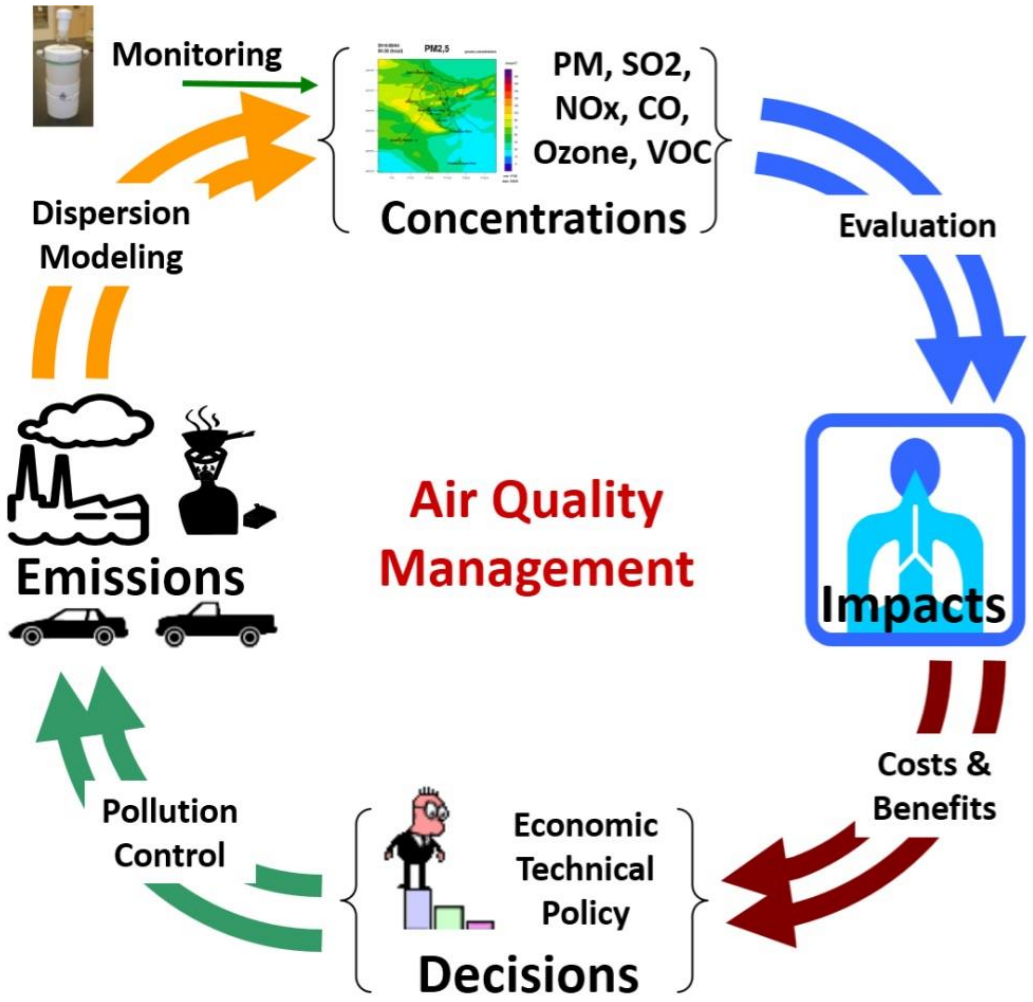
Women and girls: time for education and productive activities



Traffic congestion
Accidents
Noise
Physical activity

Water quality
Odors
Accidents
Bio Fertilisers

Connecting systems – linking environment and ECD



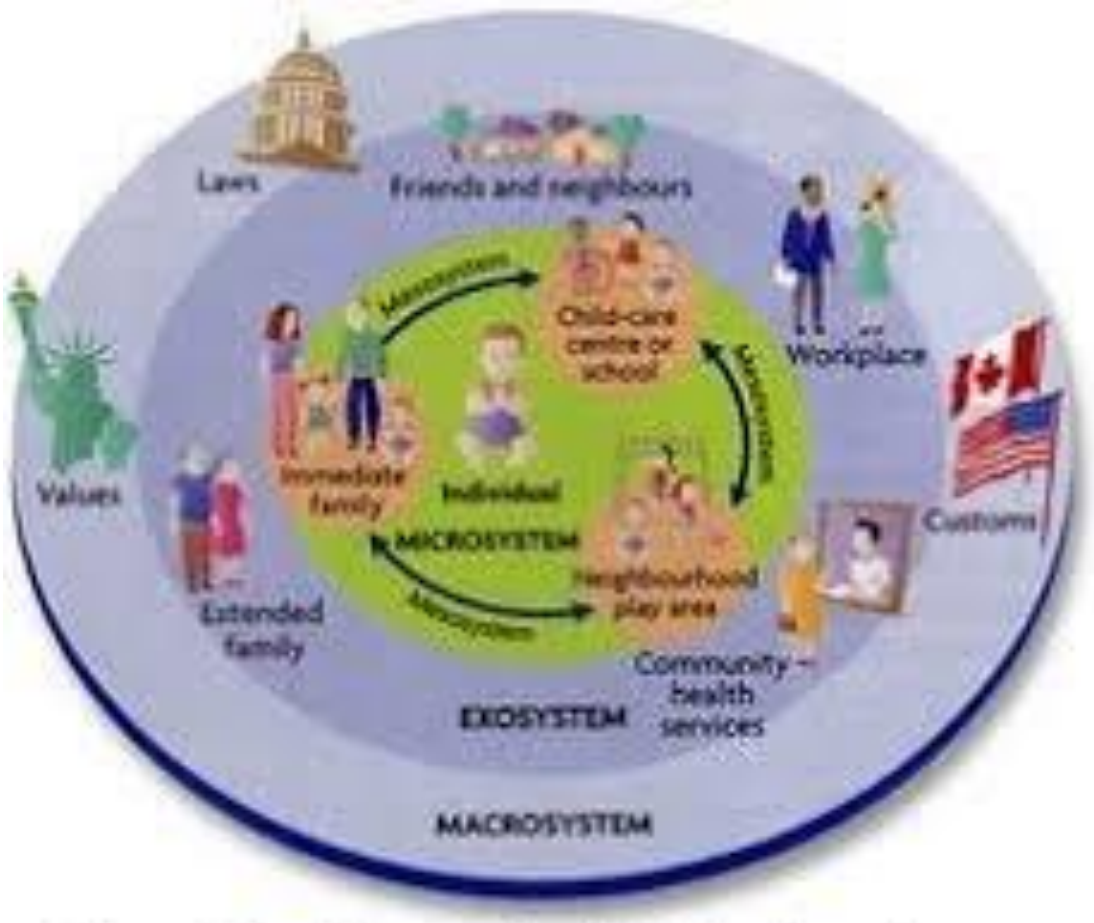
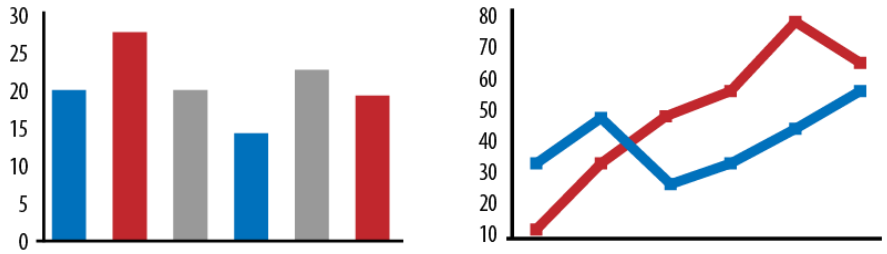


Figure 1. Bronfenbrenner's ecological systems theory (in Berk & Roberts, 2009, p. 28)

5. Engage with key sectors, such as health



- Health Impact Assessments
- Costs of innaction and benefits from interventions
- Senario analyses – what is expected from interventions

Create partnerships with social science institutions, civil society, integrate their knowledge and perspective regarding the social and political context

Engage with institutions working with public policies, such as Development Banks, the United Nations, WHO, UNICEF, UNESCO

Health Professionals

- Can advice on behaviours
- Listen to constraints people face
- Communicate about risks and benefits of PPs
- Follow-up and report on health changes from Public Policy change

Health facilities:

- Reduce emissions
- Waste management
- Clean Energy

6. LOOK INTO SUSTEINABLE BUSINESS MODELS

Bulk by to make the transition to clean vehicles

Bicycles for urban transporte

Electric buses: Shenzhen

16.000 autobuses electricos, la myor flota del mundo

Otras 30 ciudades en China planean tener 100% del transporte public movido a electricidad

Electric cars

7- Document and report success, track progress

Create accountability, evaluate internventions
Cooperation with statistics departaments, universities and agencies (health, urban planning, education, transport etc.)

Clean air in cities

Access to clean energy in the home

Deaths due to air pollution indoors and outdoors