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Health, climate change and air quality-state of knowledge

Andy Haines

LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE

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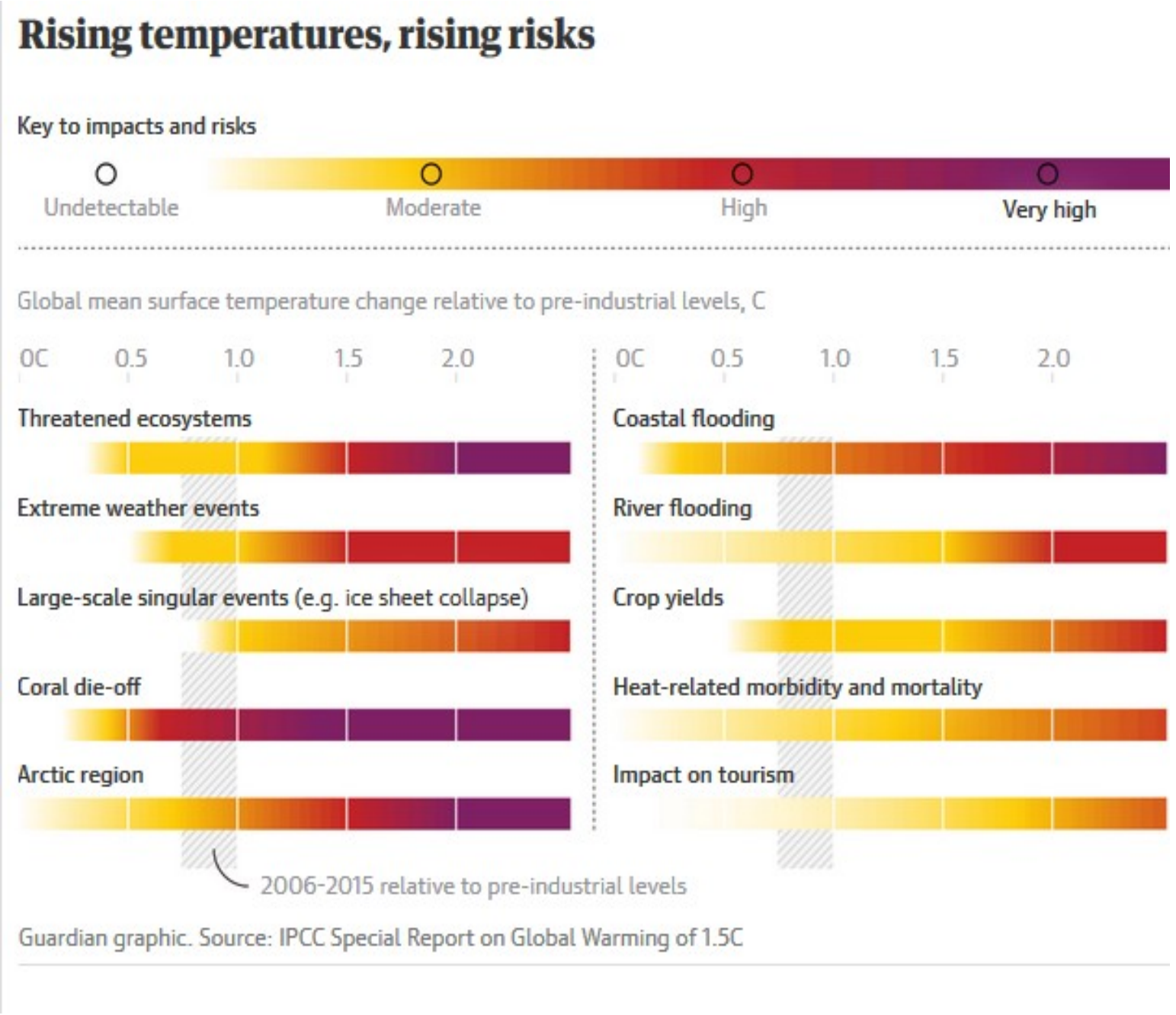
IPCC 1.5°C report 8 October 2018



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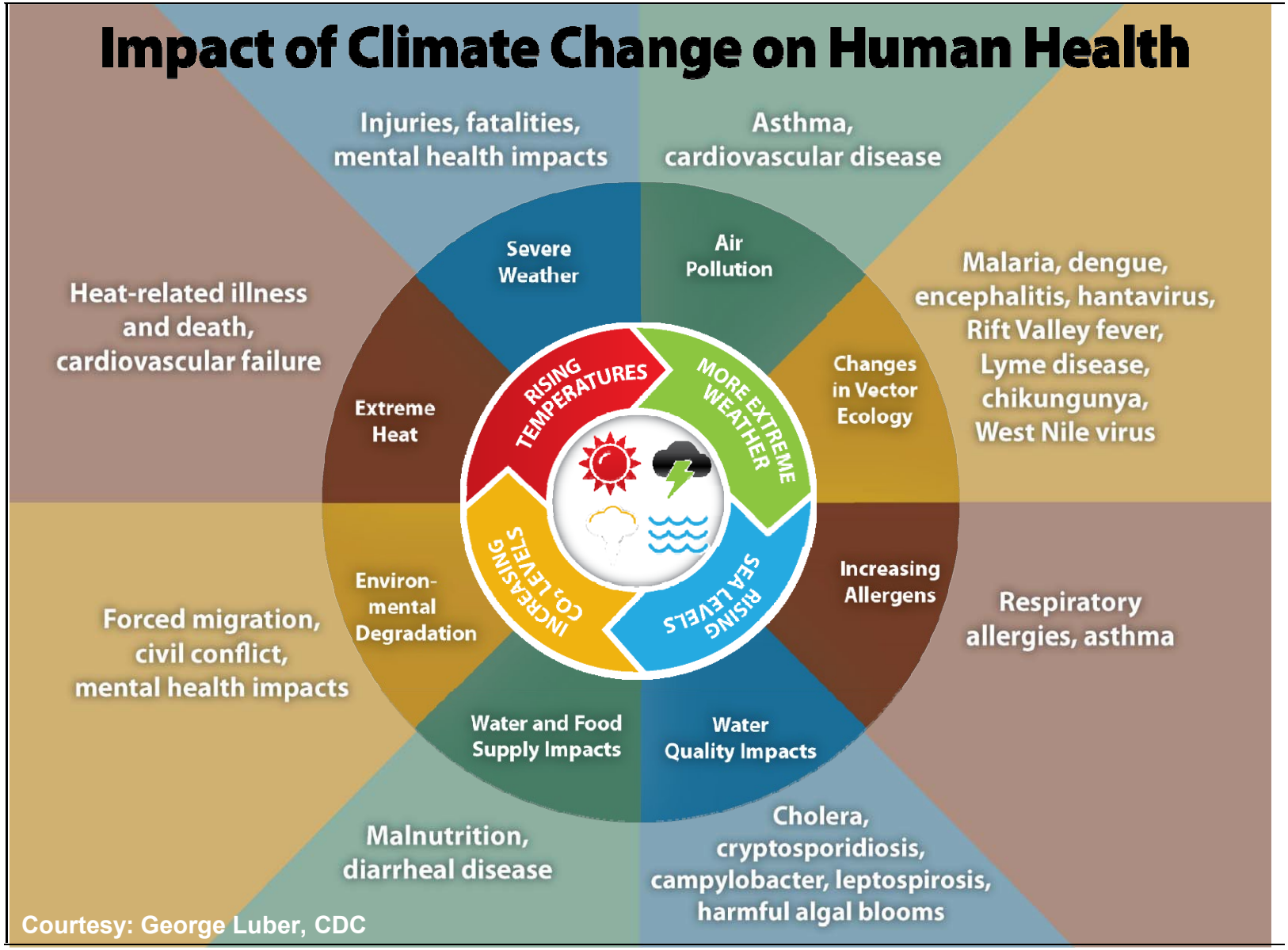

European Academies
easac
Science Advisory Council

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The imperative of climate action to protect human health in Europe

EASAC policy report 38

June 2019

ISBN: 978-3-8047-4011-2

This report can be found at www.easac.eu

Science Advice for the Benefit of Europe

- **Climate change is adversely affecting human health**
- **Climate change can have effects on health within the boundaries of the EU and also by affecting the health of populations outside the EU.**
- **Rapid and decisive climate action could greatly reduce the risks to health**
- **Much can be done by acting on present knowledge, capitalising on the health co –benefits of decarbonisation**
- **The scientific community also has important roles in generating new knowledge and countering misinformation**

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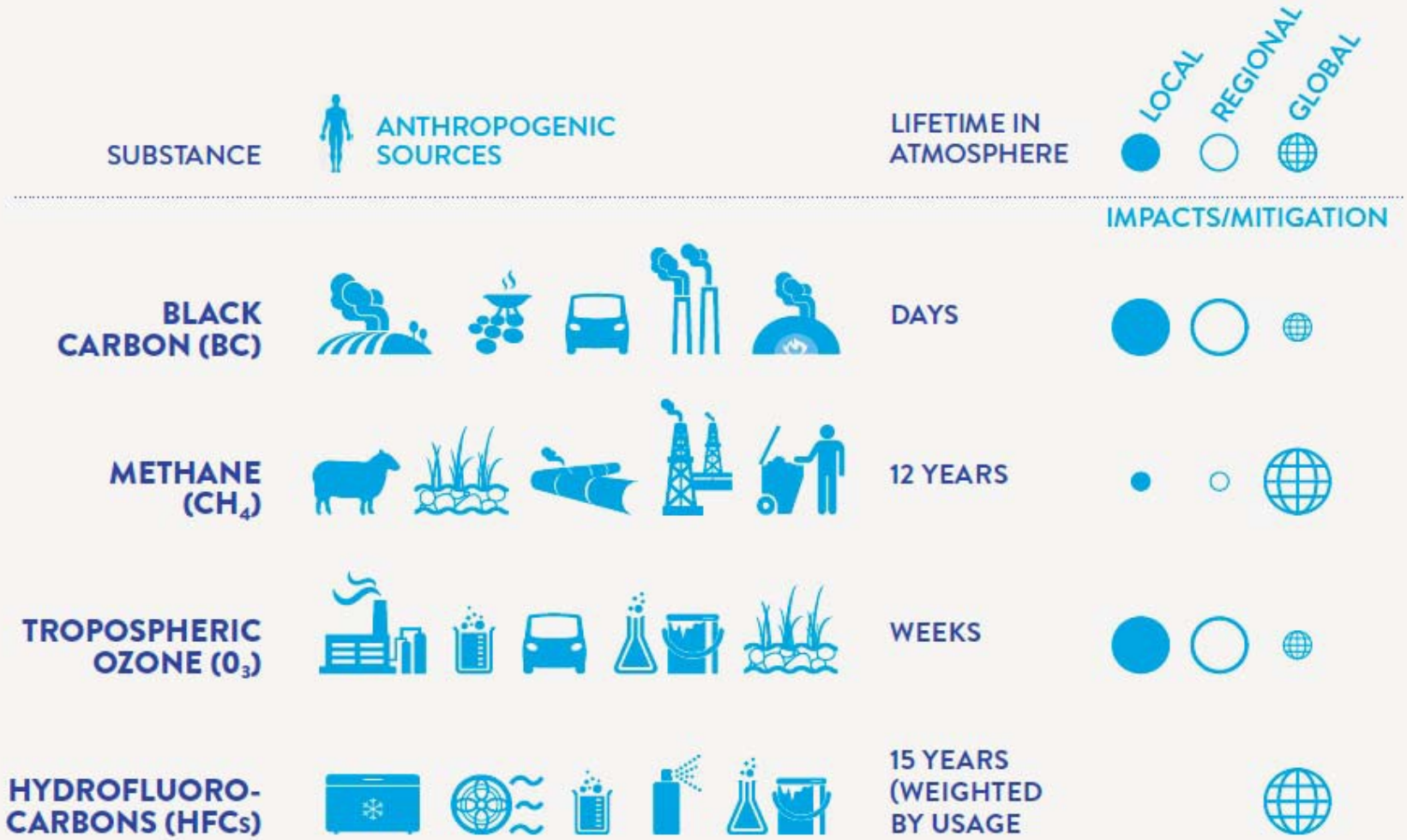
SHORT-LIVED CLIMATE POLUTANTS

Near term response to mitigation



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Air Pollution & Climate
Two Sides of Same Coin

The majority of air pollutants impact the climate (directly or indirectly)

The majority of GHG sources co-emit air pollutants (or contribute to their formation)

This interlinkage often multiplies the costs arising from our current dangerous pathway but is also an opportunity to amplify the benefits of our actions and catalyse even greater mitigation ambition

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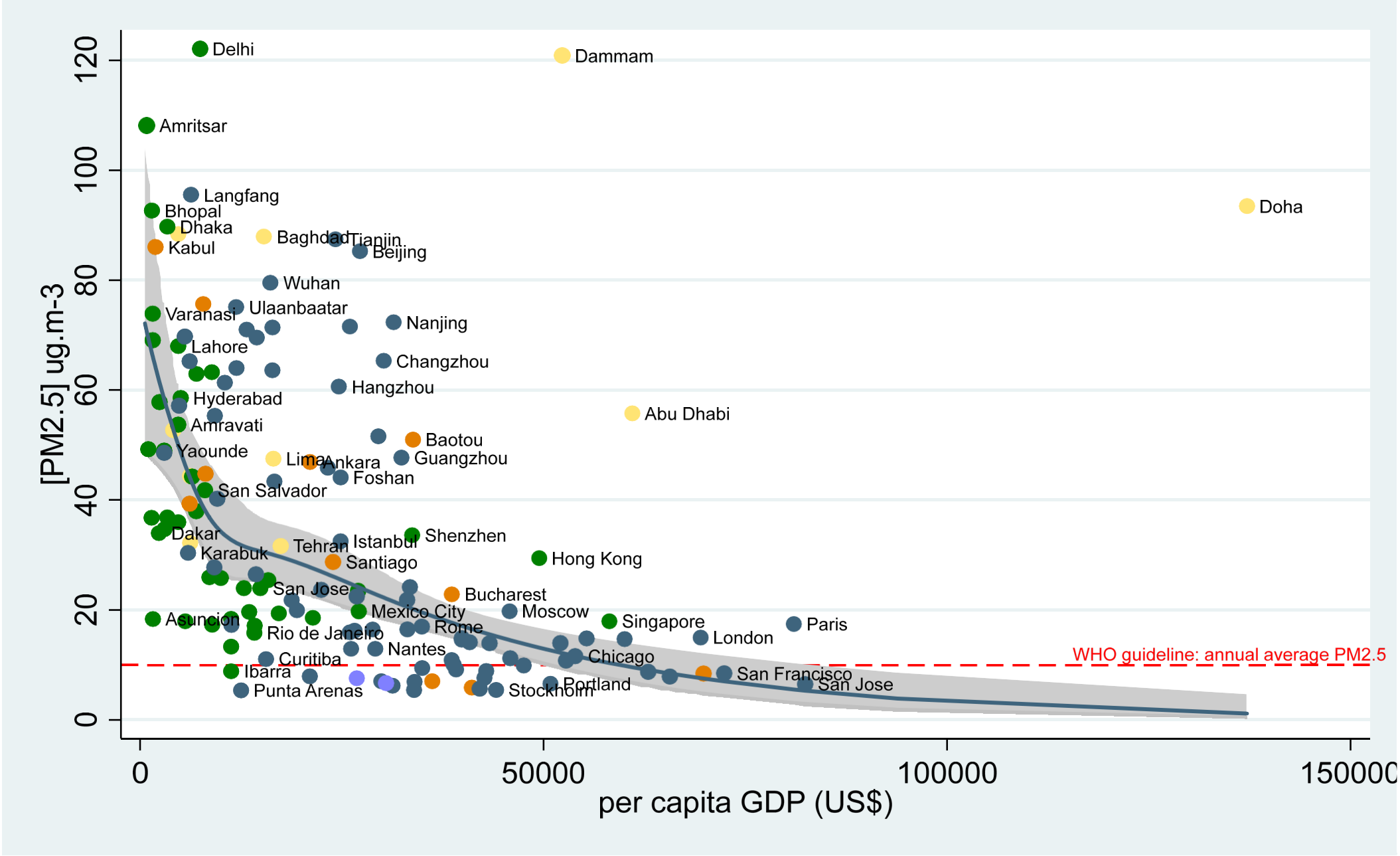
Air pollution: annual average $PM_{2.5}$, SHUE database cities

(Milner, Wilkinson , Haines, Davies) (Wellcome Trust funded)



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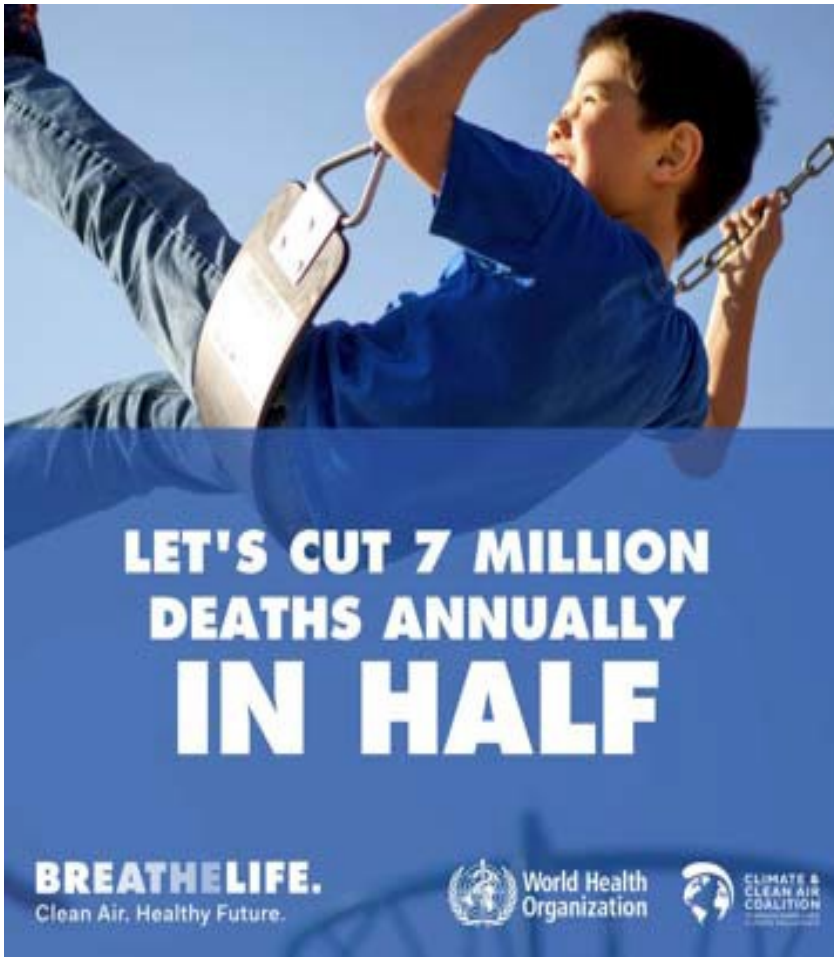

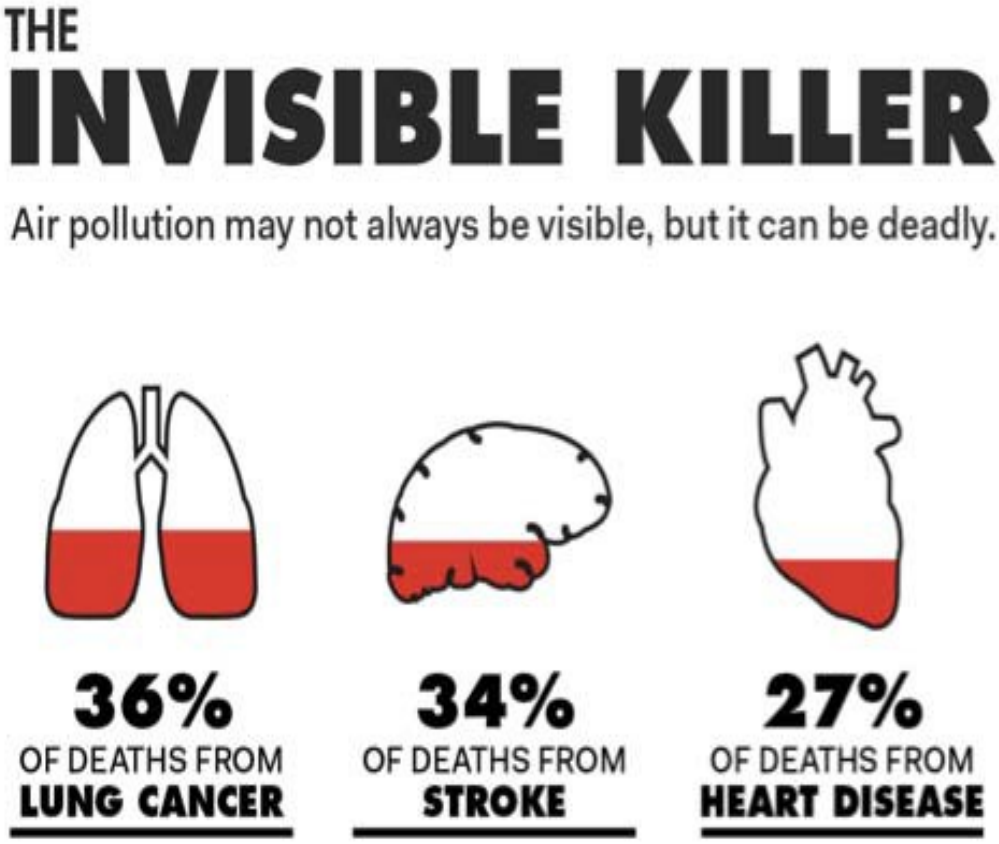

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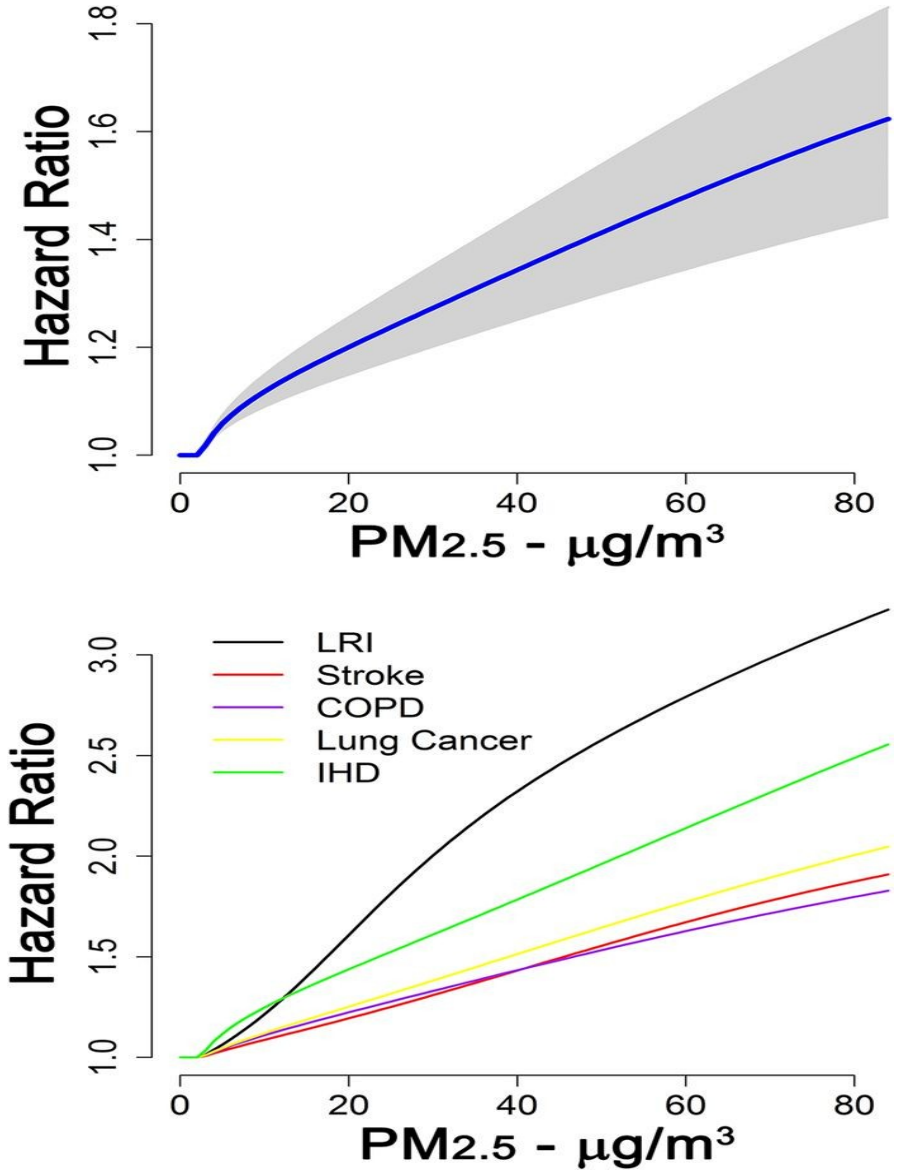
Recent (GEMM) hazard ratio predictions over PM2.5 exposure range for Non-communicable diseases plus Lower Respiratory Infections (NCD+LRI).
COPD = Chronic Obstructive Pulmonary Disease , IHD= Ischaemic Heart Disease



Richard Burnett et al. PNAS doi:10.1073/pnas.1803222115

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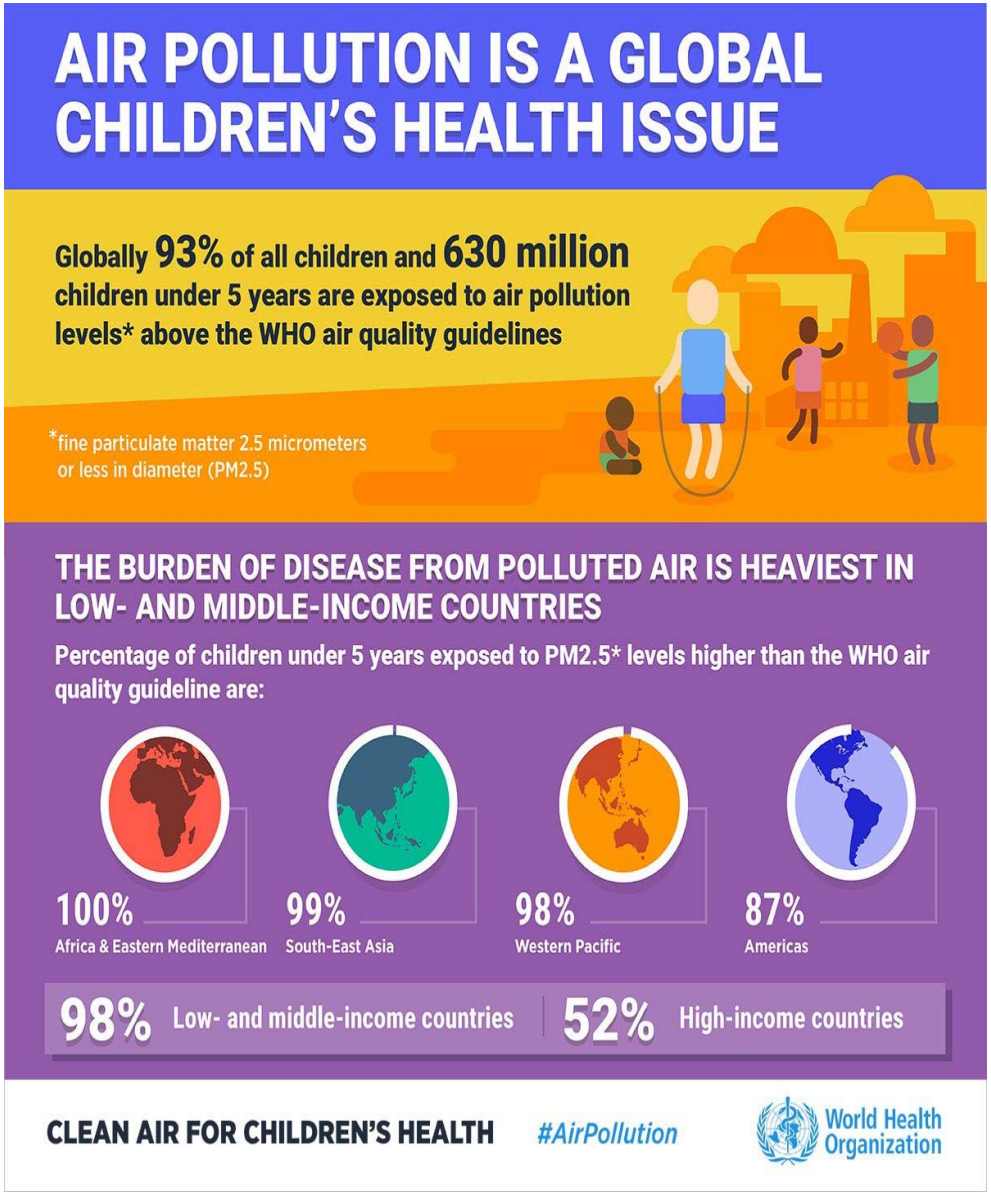
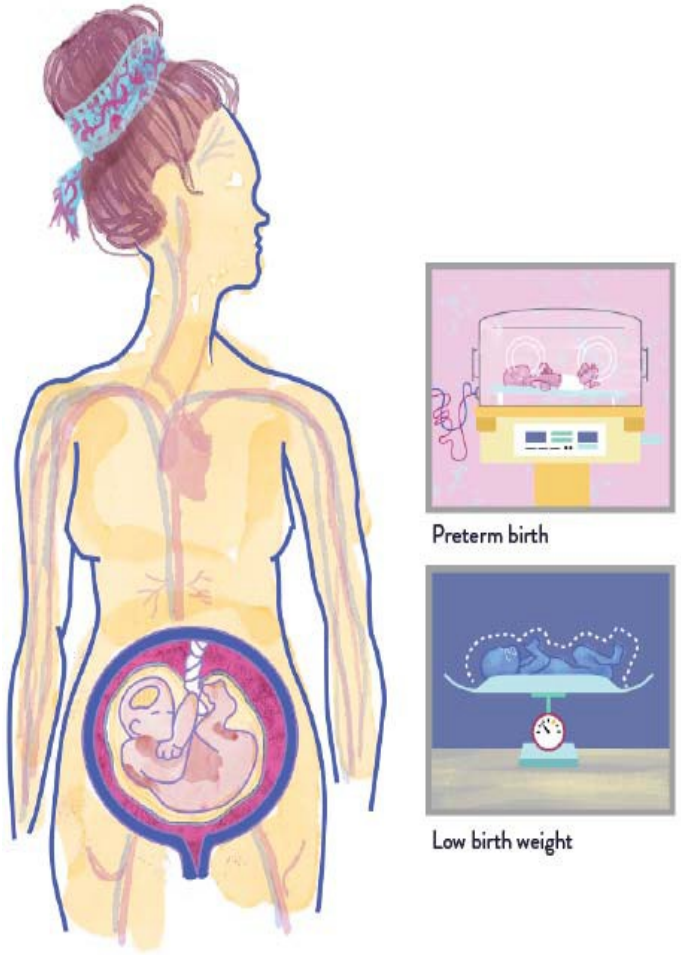
Air pollution risks to child and maternal health





Global, national, and urban burdens of paediatric asthma incidence attributable to ambient NO2 pollution: estimates from global datasets

Pattanun Achakulwisut, Michael Brauer, Perry Hystad, Susan C Anenberg, Lancet Planetary Health 2019

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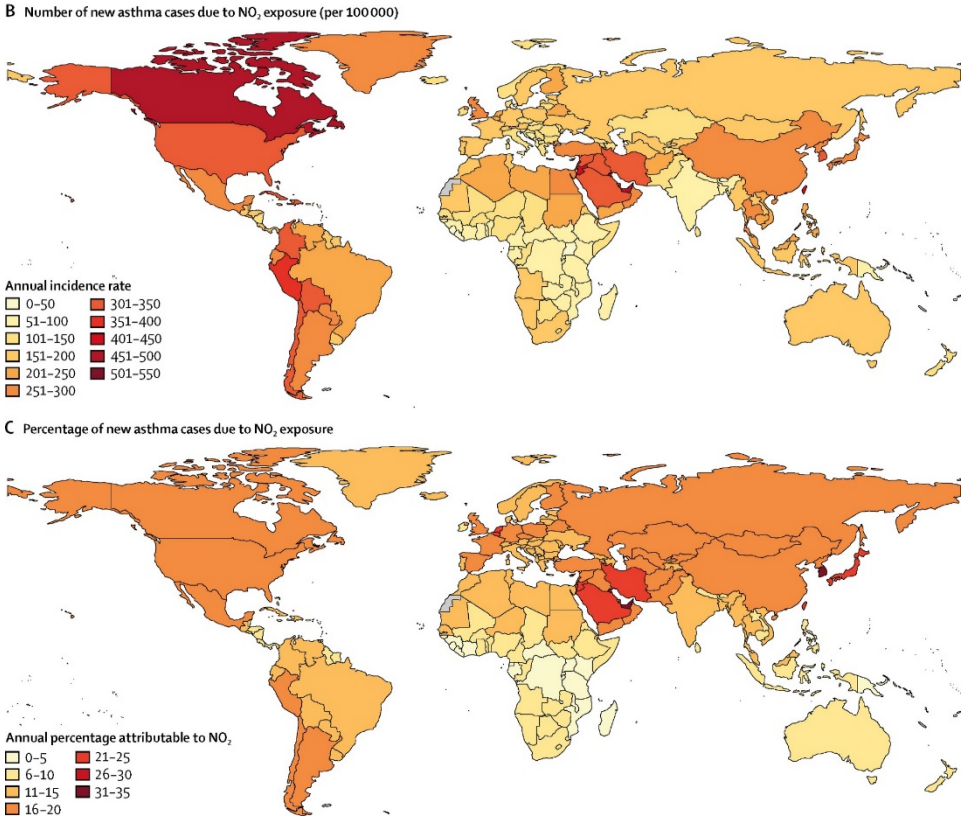

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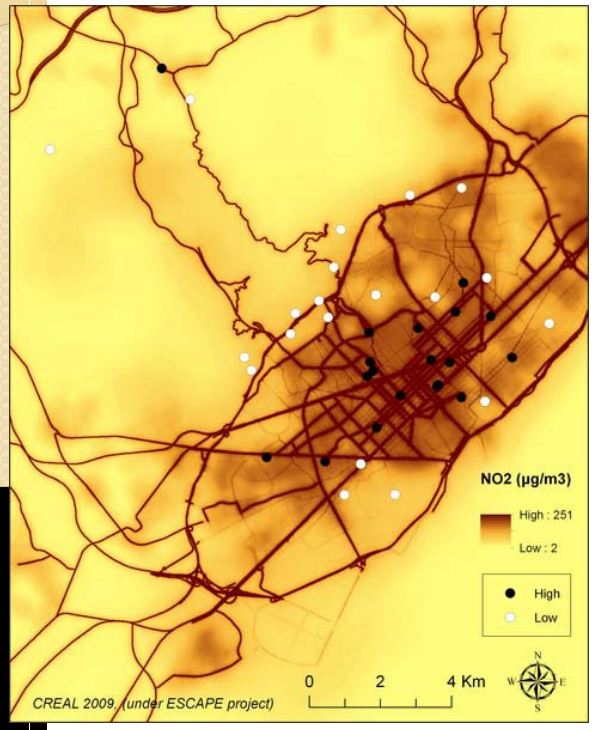
Transport –related air pollution and cognitive development in children



Children attending schools in Barcelona exposed to higher levels of Elemental Carbon,NO2,and UFP experienced substantially smaller growth in all the cognitive measurements;

r J,, et al. (2015) Association between Traffic-Related Air Pollution in Schools ognitive Development in Primary School Children: A Prospective Cohort PLoS Med

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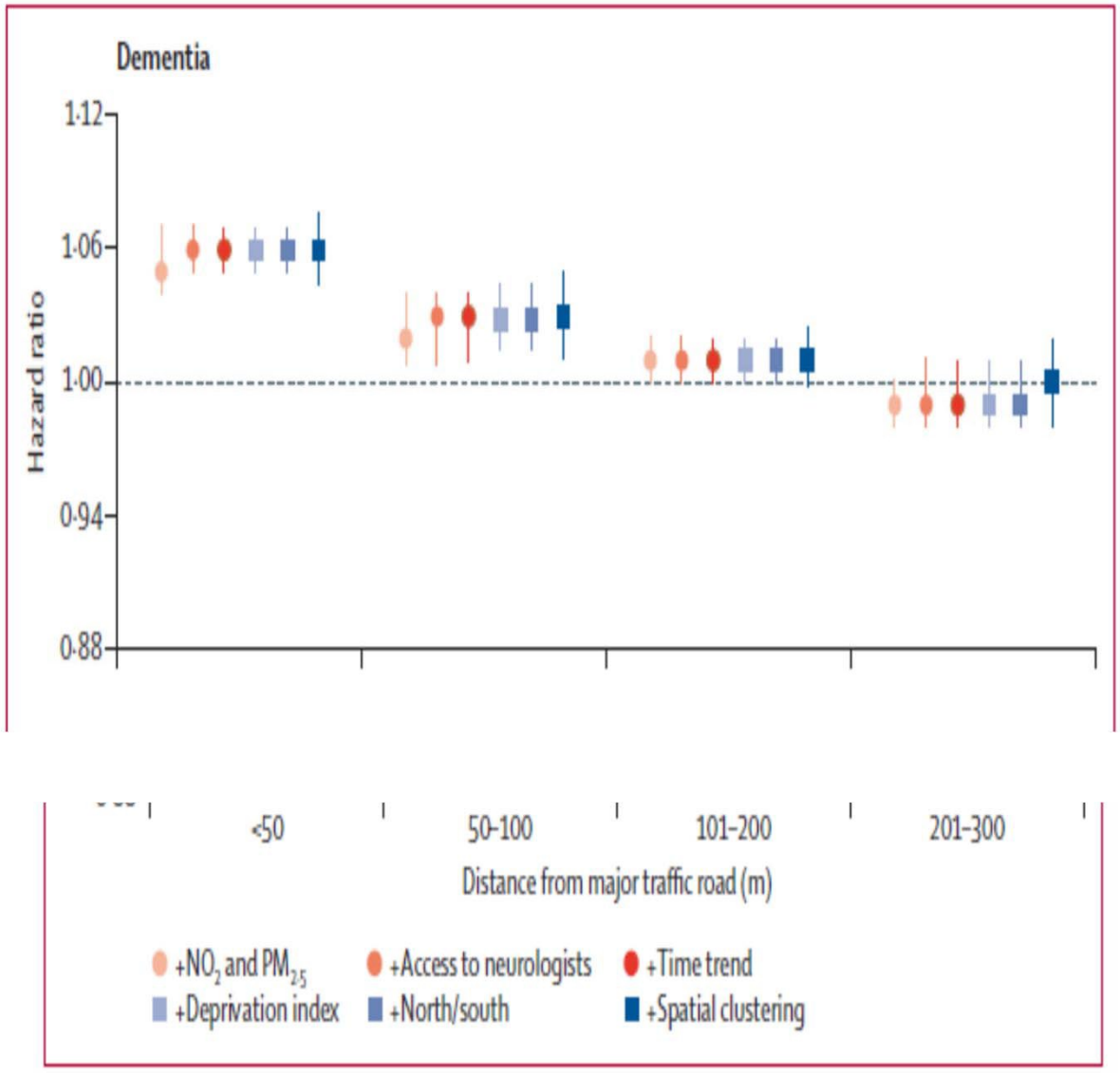
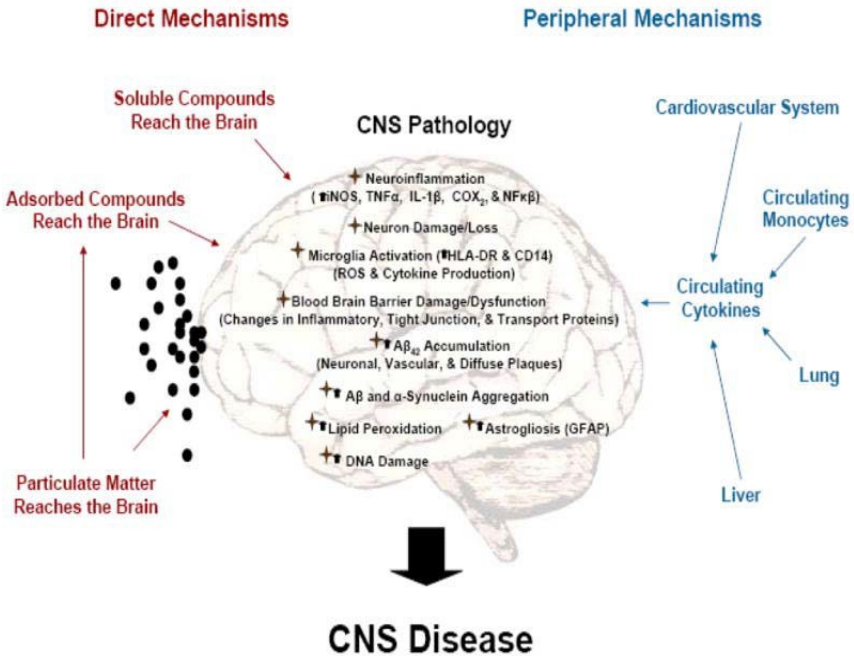
Possible increased risk of dementia – proximity to major road

(Chen et al Lancet 2017 :389; 718-26)





Block & Calderon-Garciduenas 2009

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THE ULTIMATE SOLUTION TO POLLUTION and to climate change

Energy switching to clean renewable sources

Transition to “circular economy”

New technologies have ‘leapfrog’ potential.

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Healthy sustainable cities

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Modelled dietary change and GHG emissions

(Milner et al 2015 BMJ Open)

- Average dietary CO2e emissions per person in the UK are ~**2050 kg/year** (or 5.6 kg/day)
- Following optimisation to **meet WHO nutritional guidelines**, CO2e emissions per person reduced to ~**1700 kg/year** (4.7 kg/day)
- ~**17%** decrease in dietary GHG emissions
- The dietary changes would save ~**7 million** life years over 30 years, mainly from reduced **coronary heart disease.**
- Projected increase in life expectancy of ~ **8 months**

Under 2 Degrees Celsius: Fast Action Policies to Protect People and the Planet from Extreme Climate Change

http://ccacoalition.org/en/resources/summary-under-2-degrees-celsius-fast-action-policies-protect-people-and-planet-extreme

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