Health co-benefits of mitigation policies for air pollution

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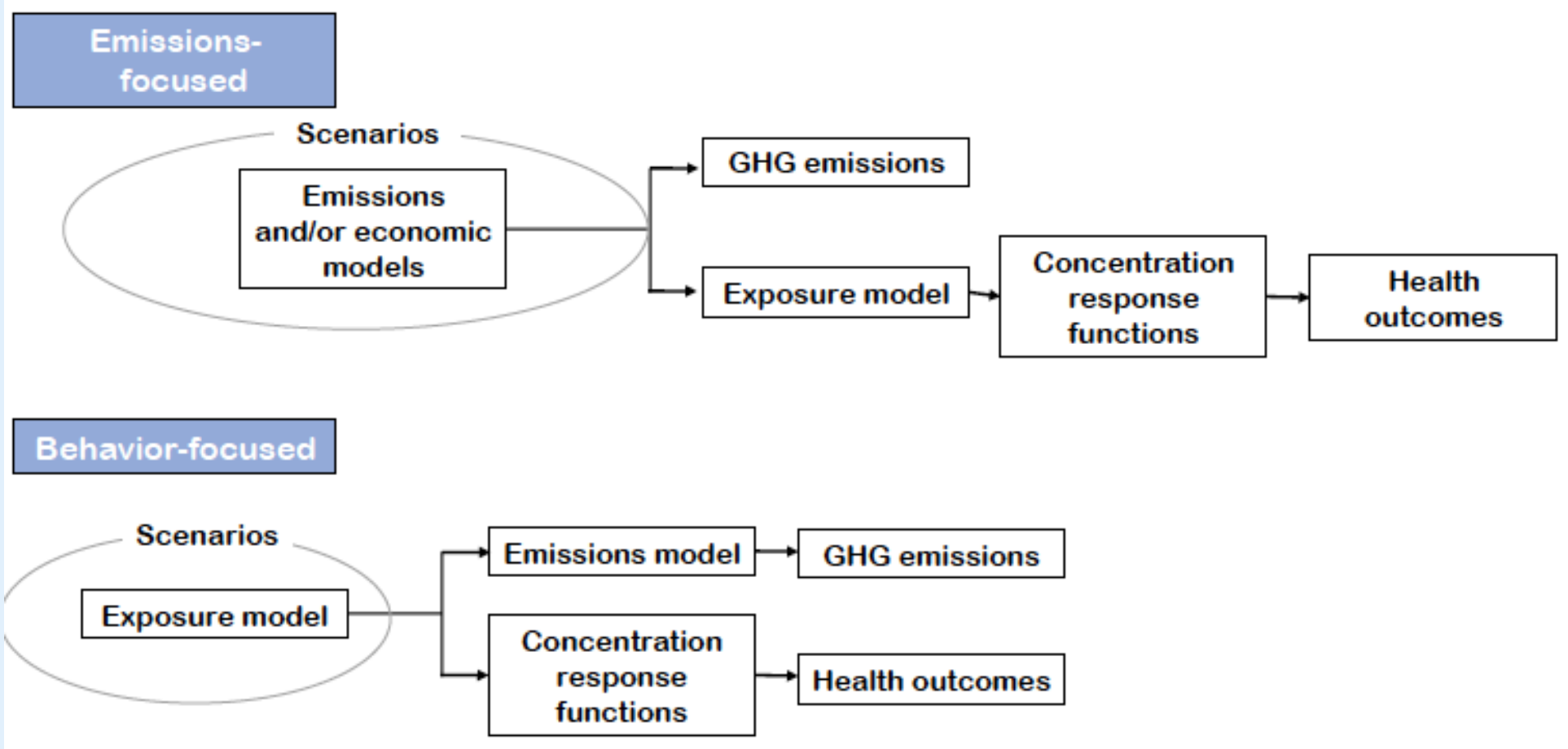
IPCC 2007

There is high agreement and much evidence that mitigation actions can result in near-term co-benefits (e.g. improved health due to reduced air pollution) that may offset a substantial fraction of mitigation costs

Examples of actions with co-benefits include improved energy efficiency and cleaner energy sources, leading to reduced emissions of health-damaging, climate-altering air pollutants …

Two basic approaches to define scenario for health co-benefits study



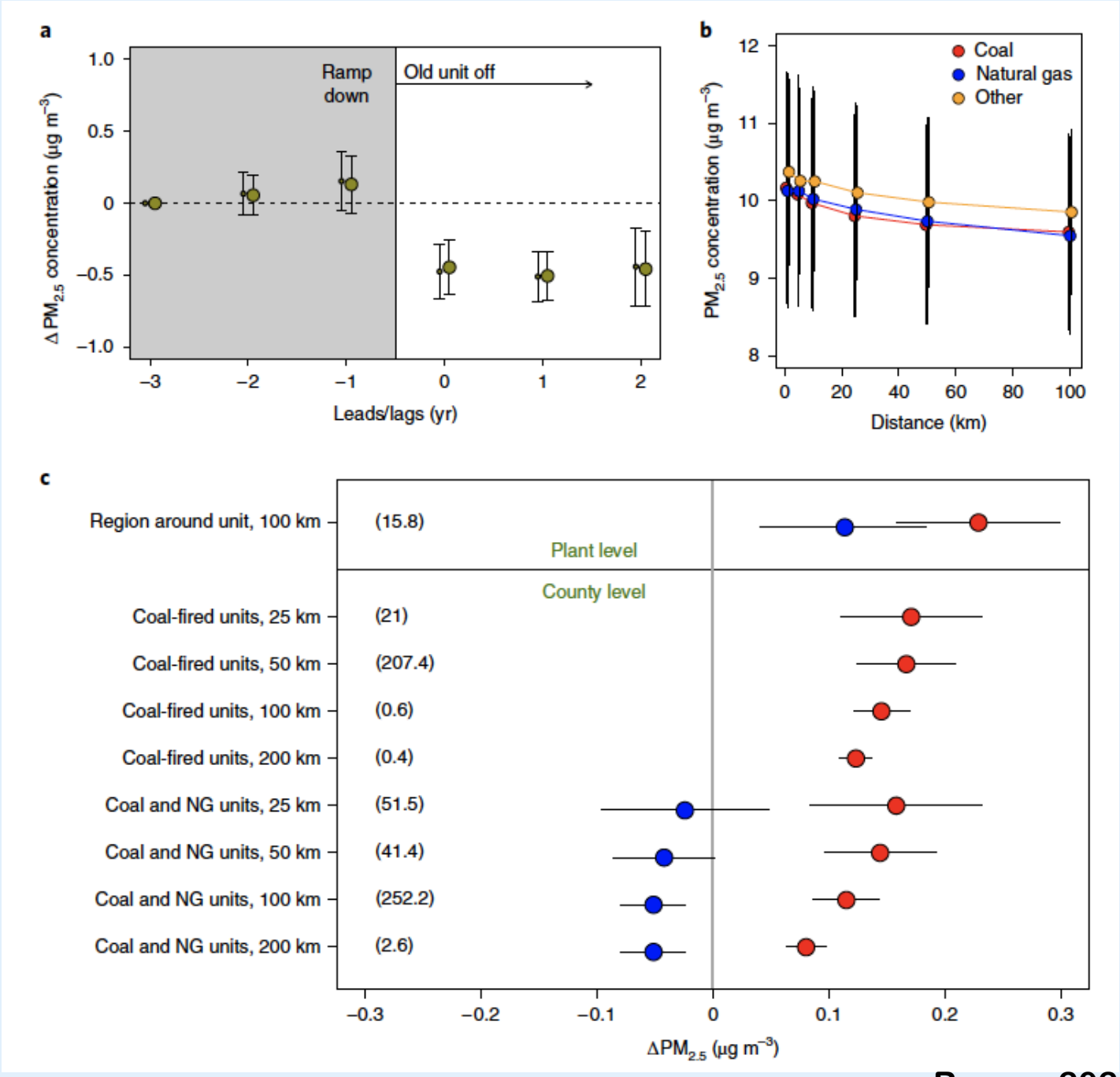
- Emissions-focused typical of studies of air quality
- Behavior-focused typical of studies of transport and diet

Chang et al. 2017

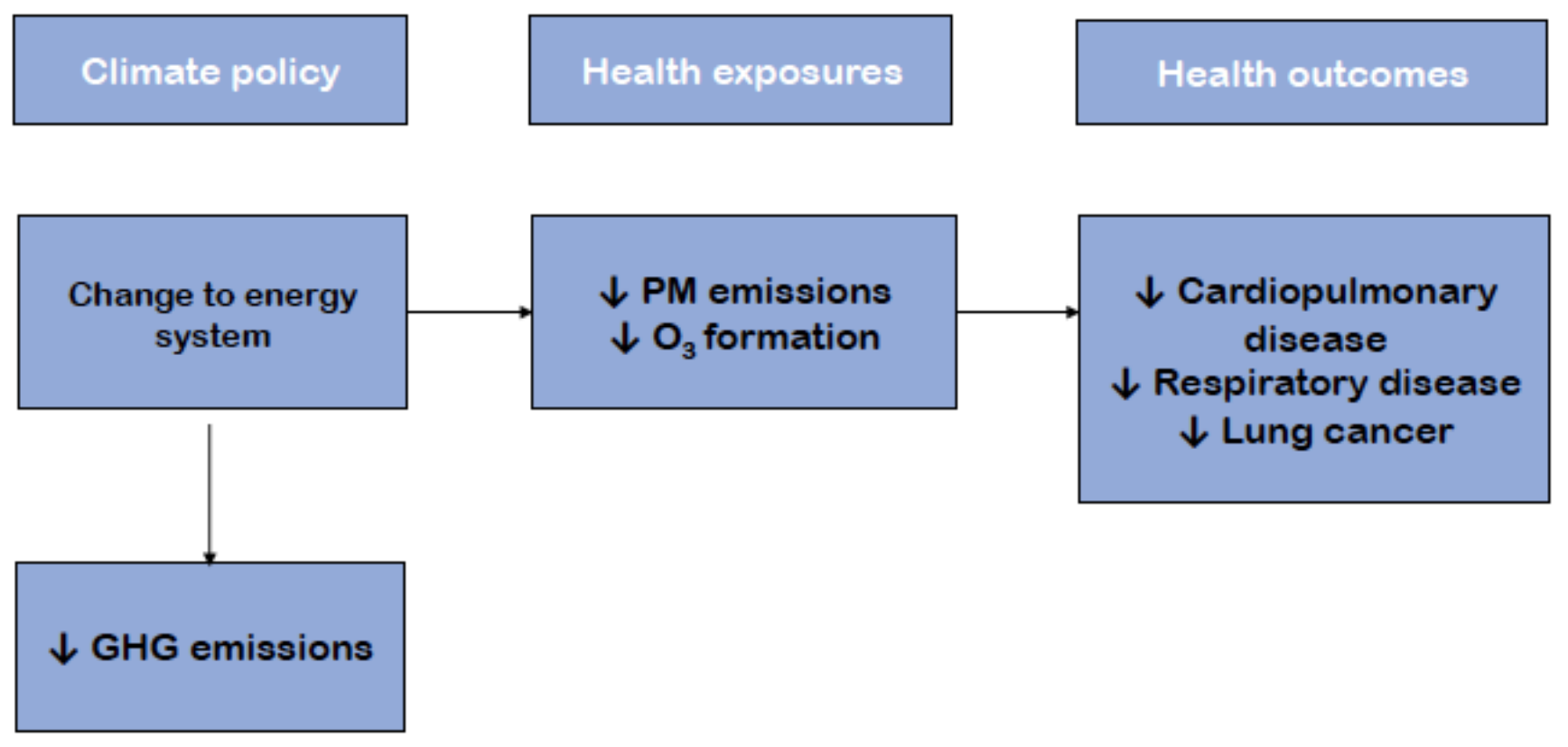
Impacts of old and new coal- and natural gas-fired units on PM2.5 concentrations in US

shut-down of coal-fired units associated with an average reduction of 0.5 ug/m3

decommissioning of 334 coal-fired units at 138 facilities associated with an estimated 26,610 lives saved over 2005-2016



Burney 2020

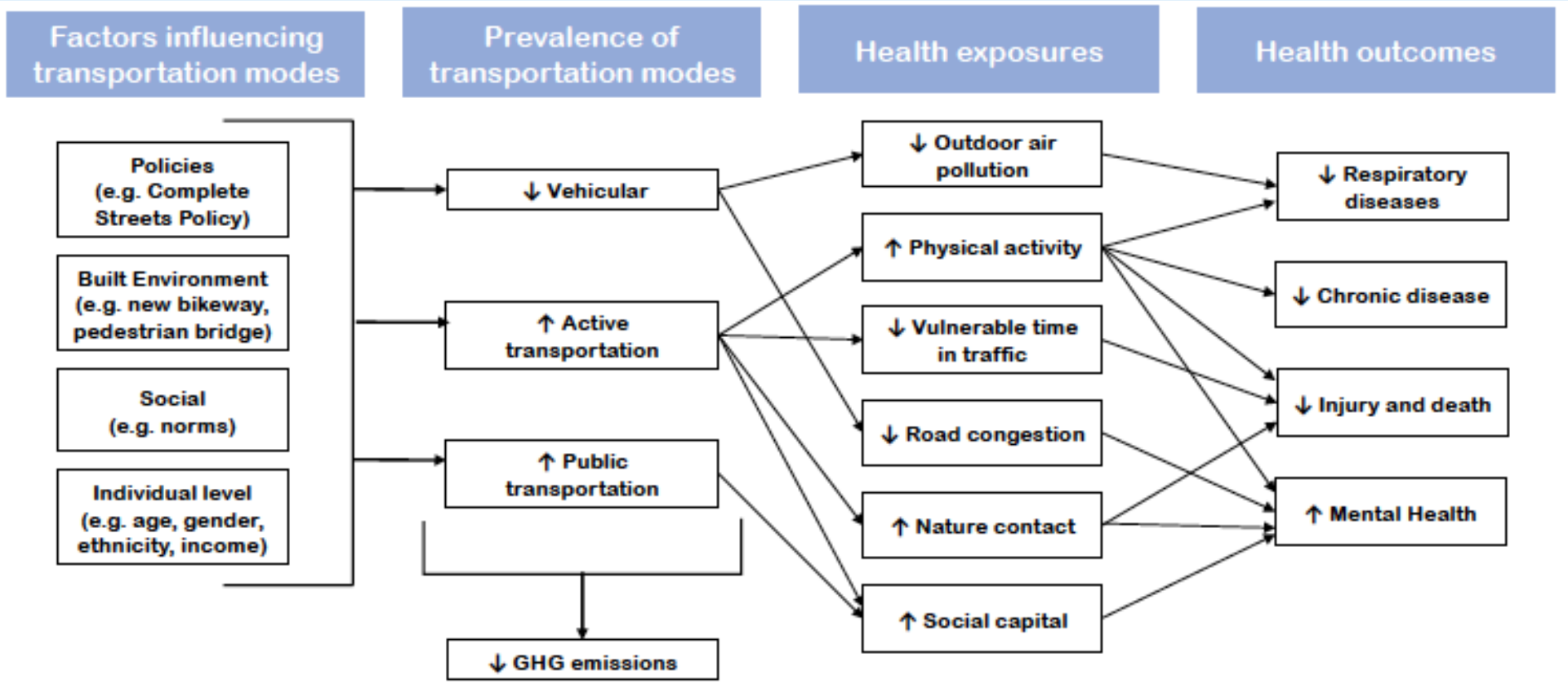


- **Combatting climate change can reduce air pollution by reducing the climate penalty on air quality and by reducing co-emitted air pollutants**
  - **Power plants, certain industrial processes, mobile sources, & agricultural activities are sources of GHG emissions**

Chang et al. 2017

5th Assessment Report (AR5; 2014)

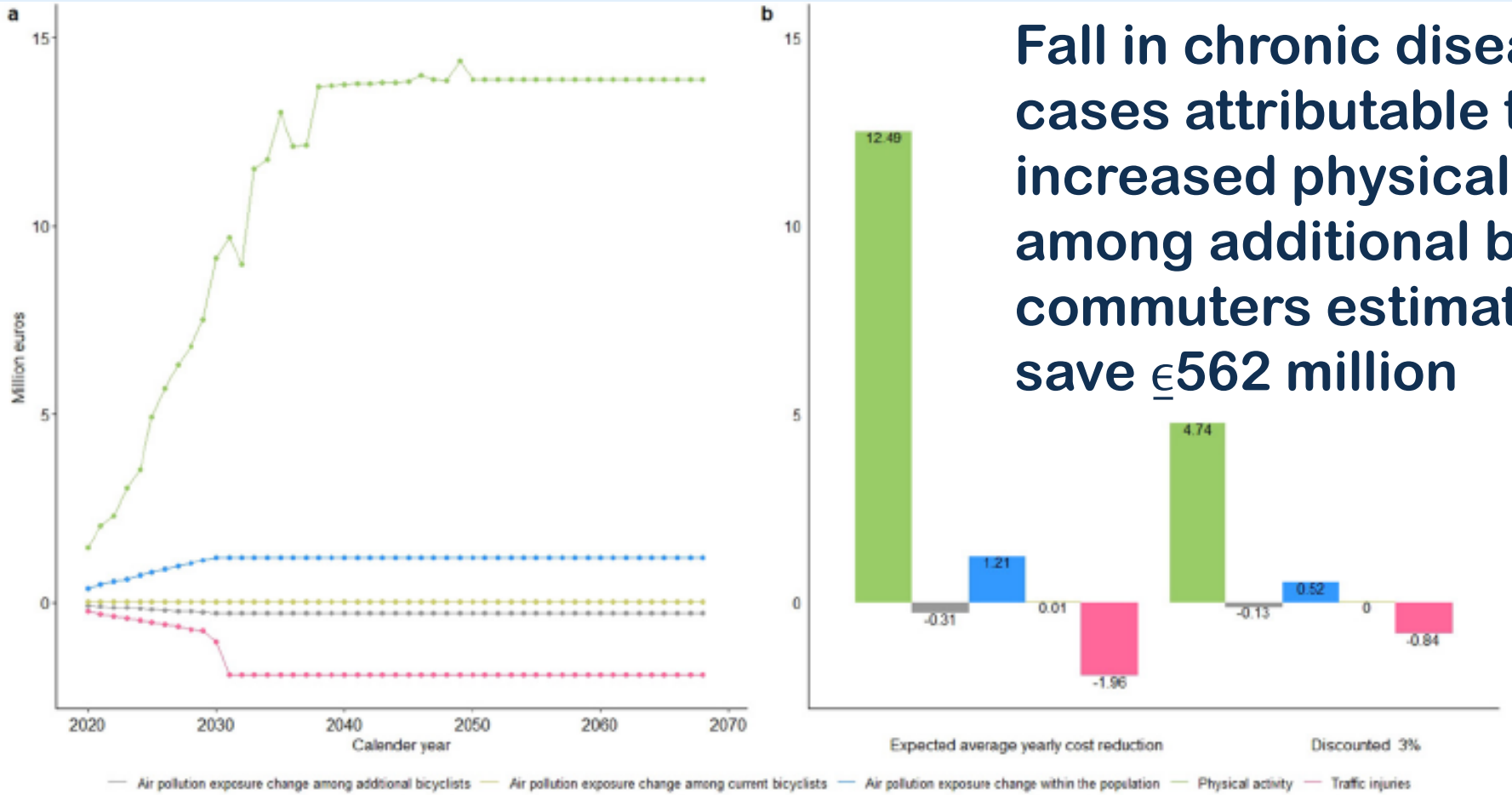
- *Mitigation scenarios reaching about 450 to 550 ppm CO2-eq by 2100 show reduced costs for achieving air quality and energy security objectives, with significant co-benefits for human health, ecosystem impacts, and sufficiency of resources and resilience of the energy system*
- *The benefits of reduced impacts to health and ecosystems associated with major cuts in air pollutant emissions are particularly high where currently legislated and planned air pollution controls are weak*



- The proportion of emissions accounted for by transportation increases as more renewable energy is used in other sectors
  - Road transport responsible for about 36% of GHG emissions in California and 40% in New Zealand
- 12 studies

Chang et al. 2017

Promoting bicycling as active transport in Stockholm



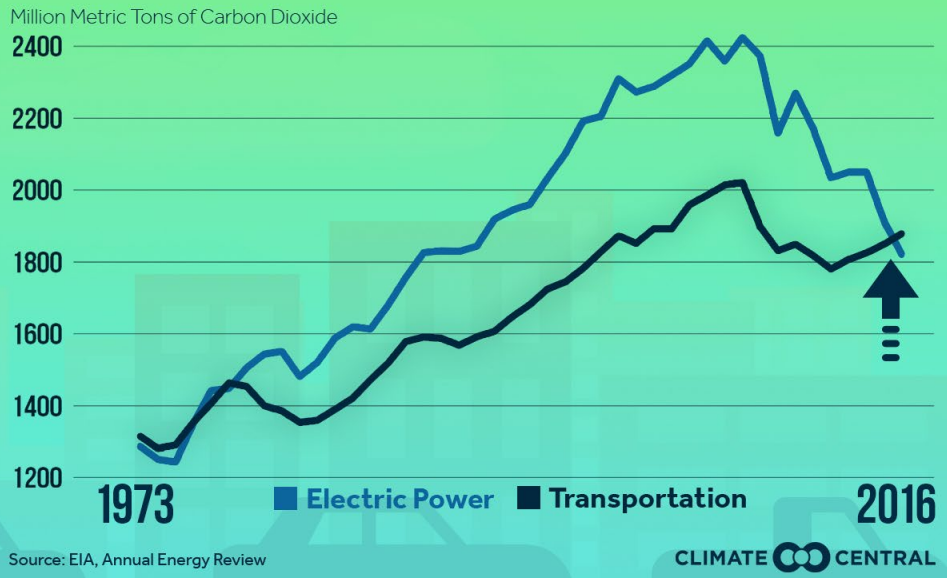
Fall in chronic disease cases attributable to increased physical activity among additional bicycle commuters estimated to save €562 million

Figure 2 Estimated yearly expenditure averted (in millions) in the healthcare sector due to increased physical activity, change in air pollution concentrations and risk of traffic injuries.

Kriit et al. 2019

EMISSIONS FLIP

Transportation is Biggest Source of U.S. Emissions



IPCC SR1.5

- *The reduction of short-lived climate pollutants such as methane, aerosols black carbon, and co-emissions from vehicles provides health co-benefits by reducing air pollution and avoiding premature death*
- *This in turn enhances the institutional and sociocultural feasibility of such actions*
- *Interventions to reduce black carbon, for example, offer tangible local air quality benefits increasing the likelihood of local public support*
- *Most foreseeable climate policies, however, only slightly limit some sources of short-lived climate pollutants like traditional biomass indicating health benefits could be limited*

Conclusions

- Most studies indicate significant, nearer term, local ancillary health benefits providing impetus for policy uptake & net cost savings
- However, studies are more suited to describing the interaction of climate policy & health & the magnitude of potential outcomes than to providing specific accurate estimates of health co-benefits
- Greater consistency in selected modeling choices across the health co-benefits of climate mitigation research could facilitate evaluation of mitigation options particularly as they apply to the NDCs & promote policy uptake

Chang et al. 2017

EU Green New Deal