Public Health and Energy

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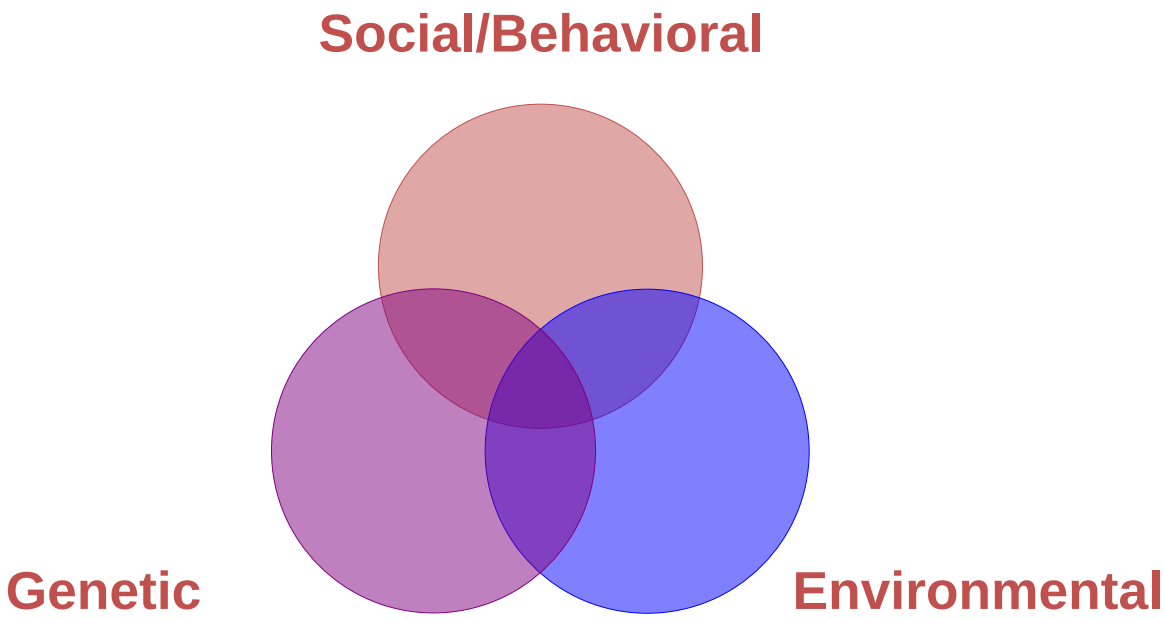
Definition of Human Health

"A state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity"

-WHO, 1948

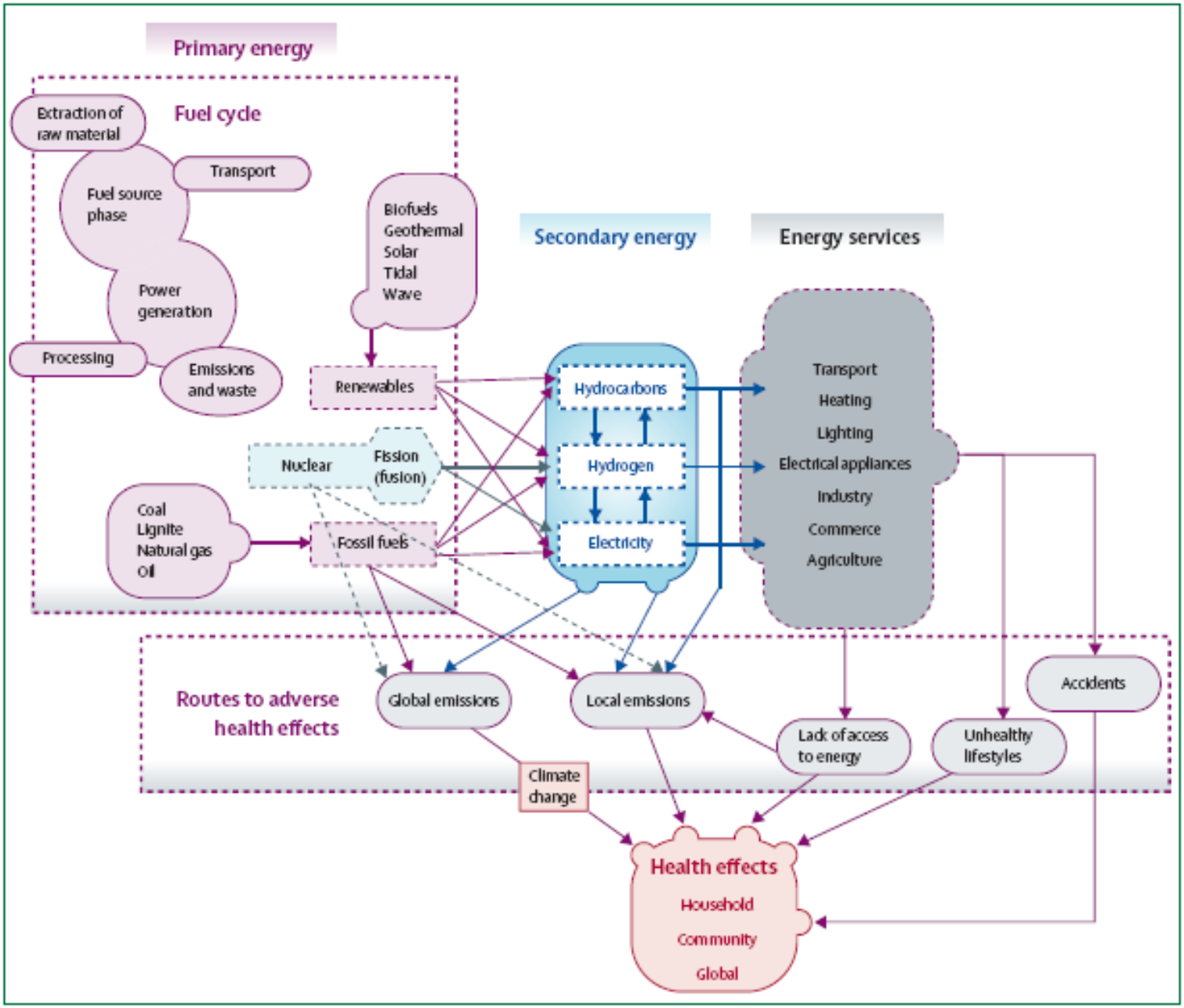
HEALTH



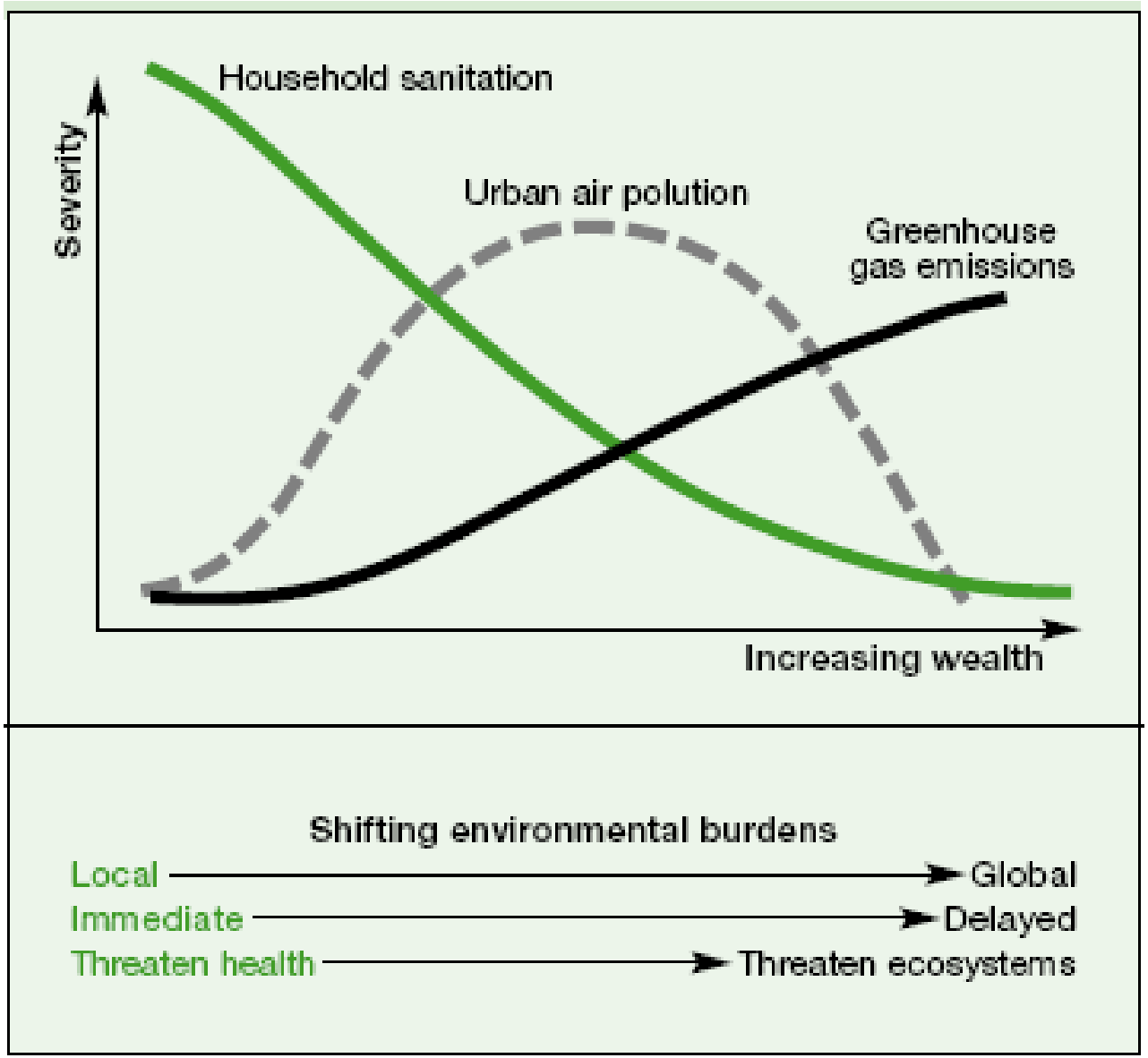
Health and Environment

- Built environment
- Social environment
- Natural environment

Connections between Energy and Health

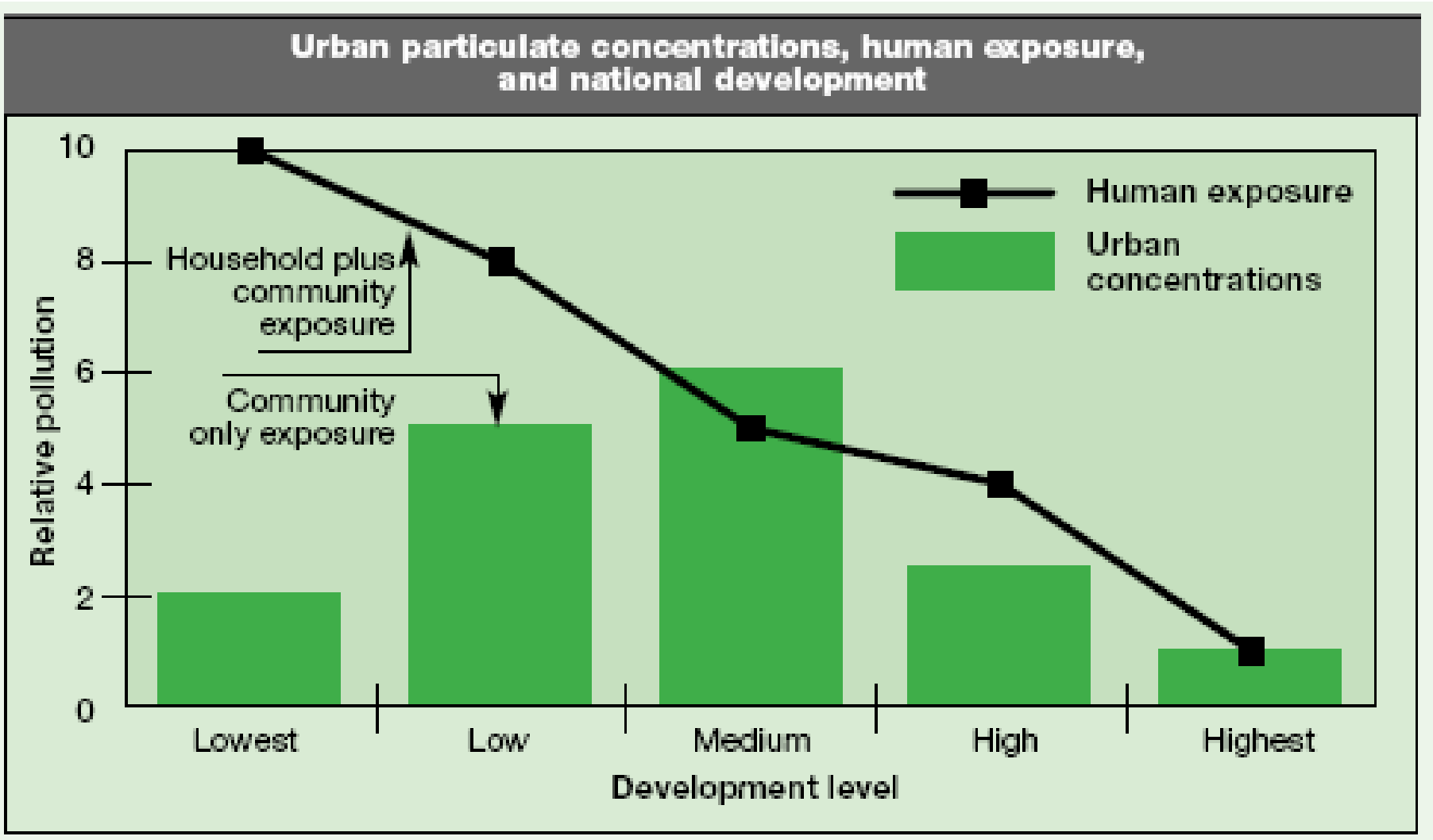


Environment/Risk Transition



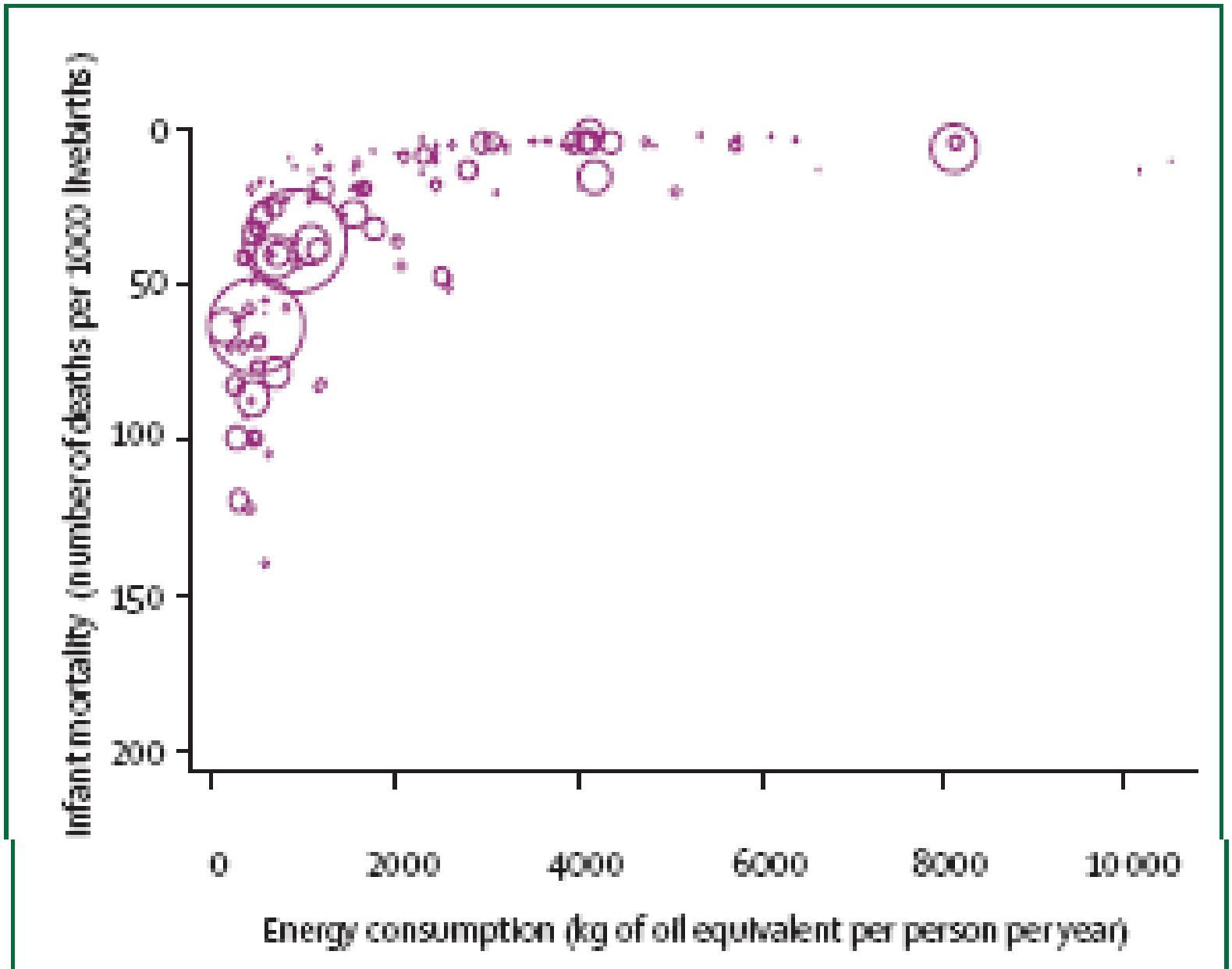
Wilkinson et al, Lancet, Vol 370, September 15, 2007

Household and community exposures

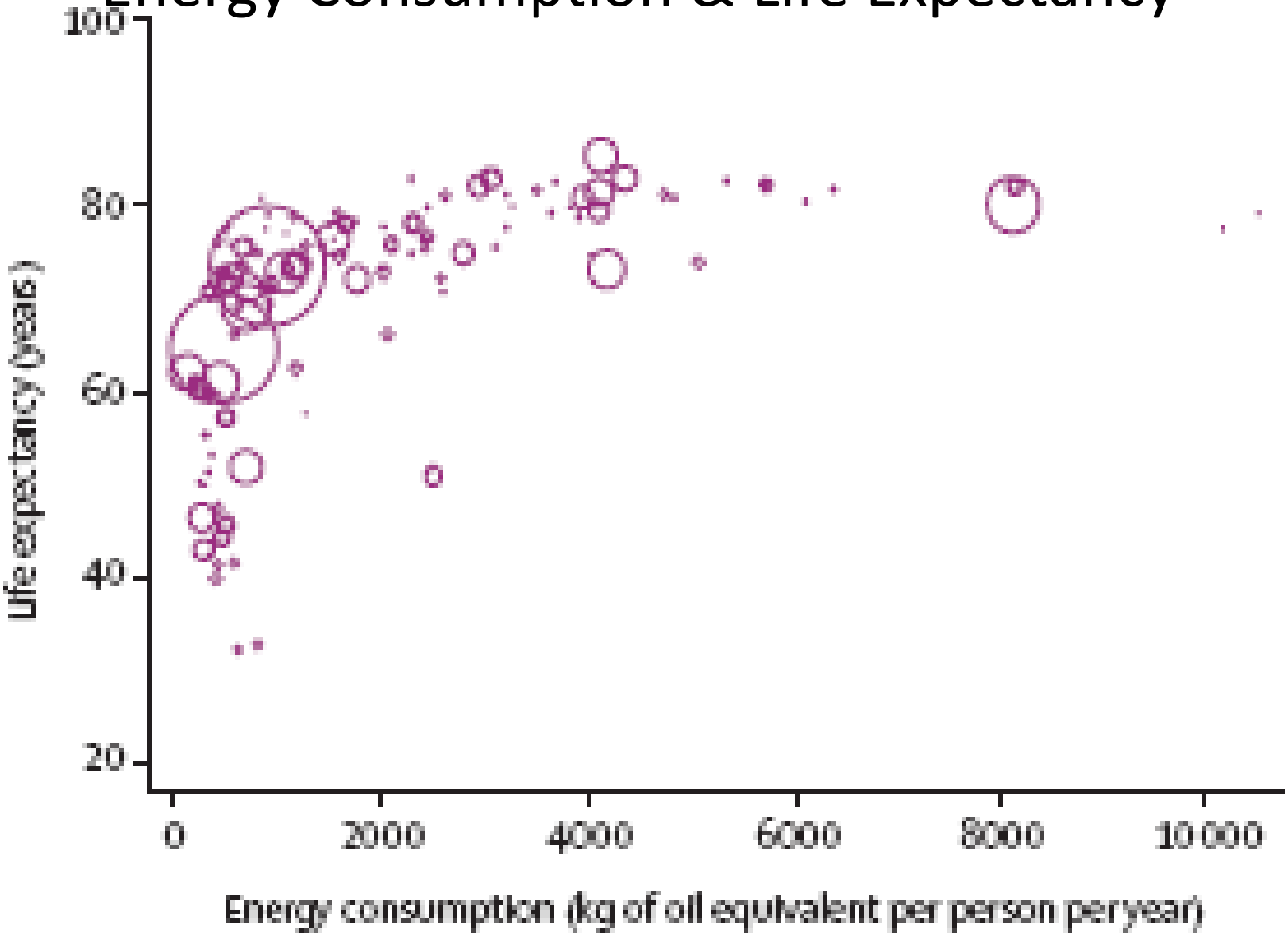


Holden and Smith: WORLD ENERGY ASSESSMENT: ENERGY AND THE CHALLENGE OF SUSTAINABILITY, Chapter 3: Energy, the Environment, and Health

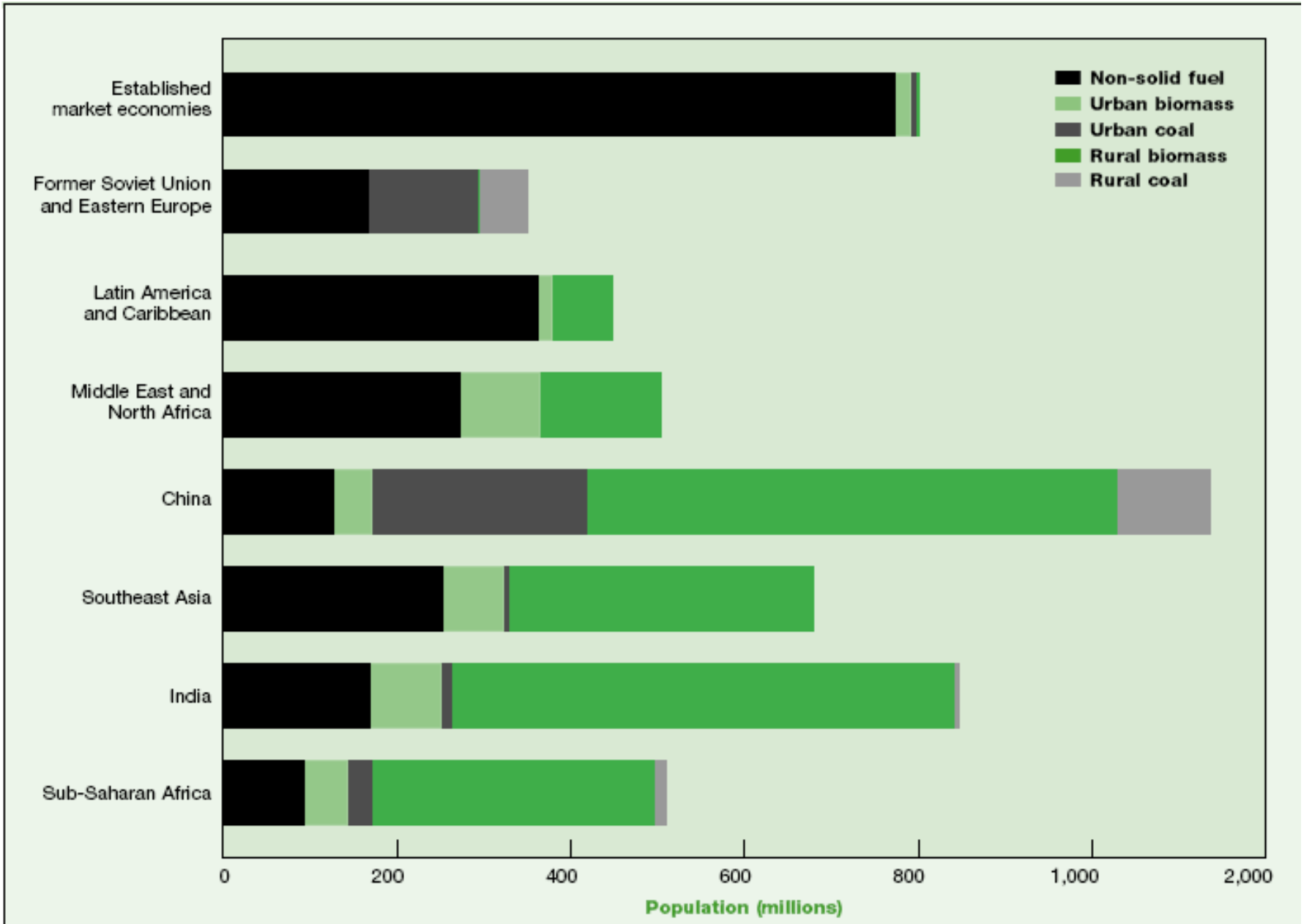
Energy Consumption & Infant Mortality



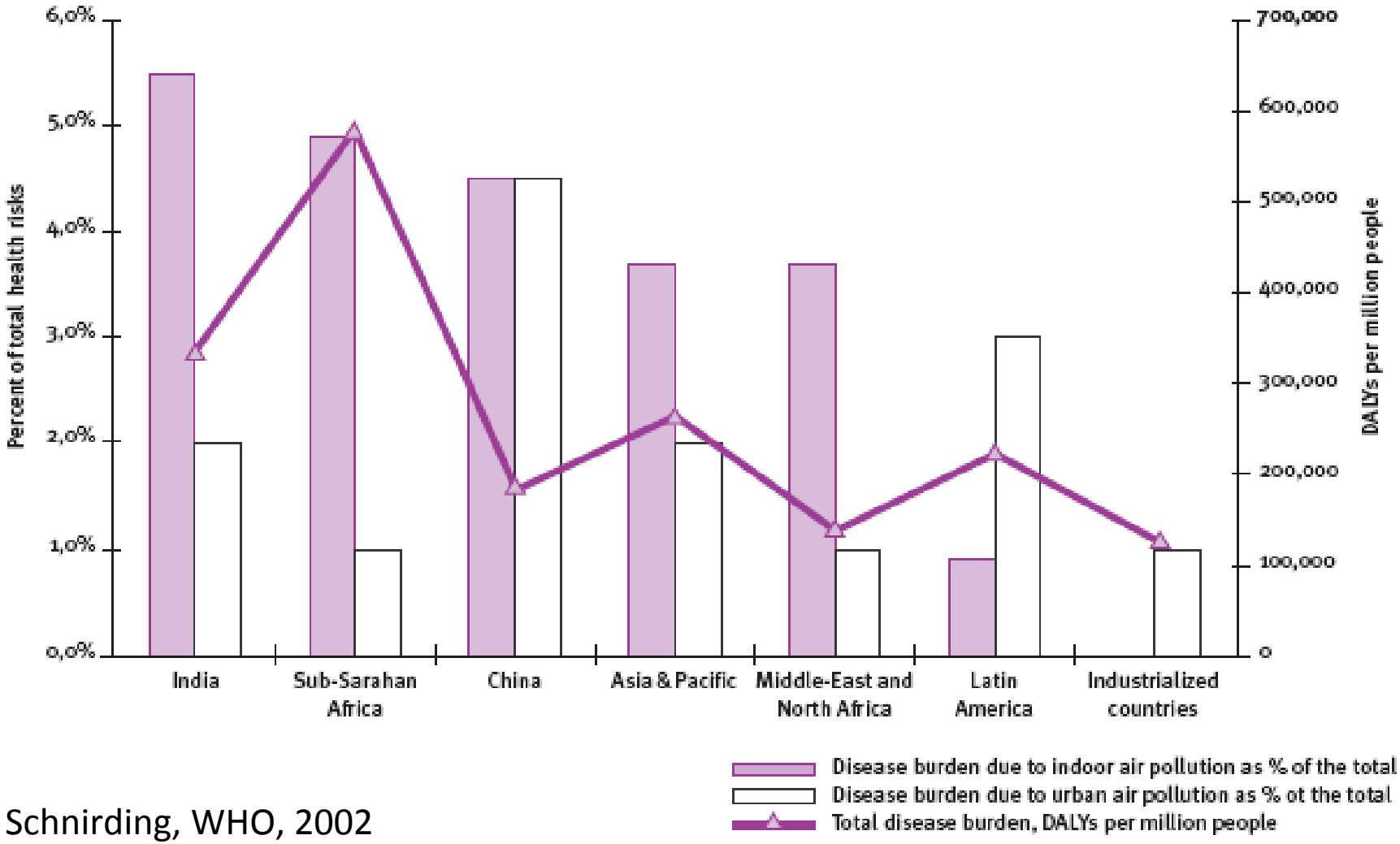
Energy Consumption & Life Expectancy



Energy Consumption by World Region



Air pollution morbidity and mortality



Von Schnirding, WHO, 2002

Energy Access and Health

- Rural biomass fuel still used by 2.4 billion people not only environmentally unsustainable but also costly in terms of indoor pollution, time and hazards associated with gathering fuel
- Pollutants from such fuel cause acute and chronic lung disease, infant mortality, lung cancer and cardiovascular disease
- Such fuels produce not only CO2 but other more powerful greenhouse gases (CO, methane, VOCs , black carbon)
- Agriculture, safe drinking water systems, health care all dependent on reliable supplies of energy mostly electrical

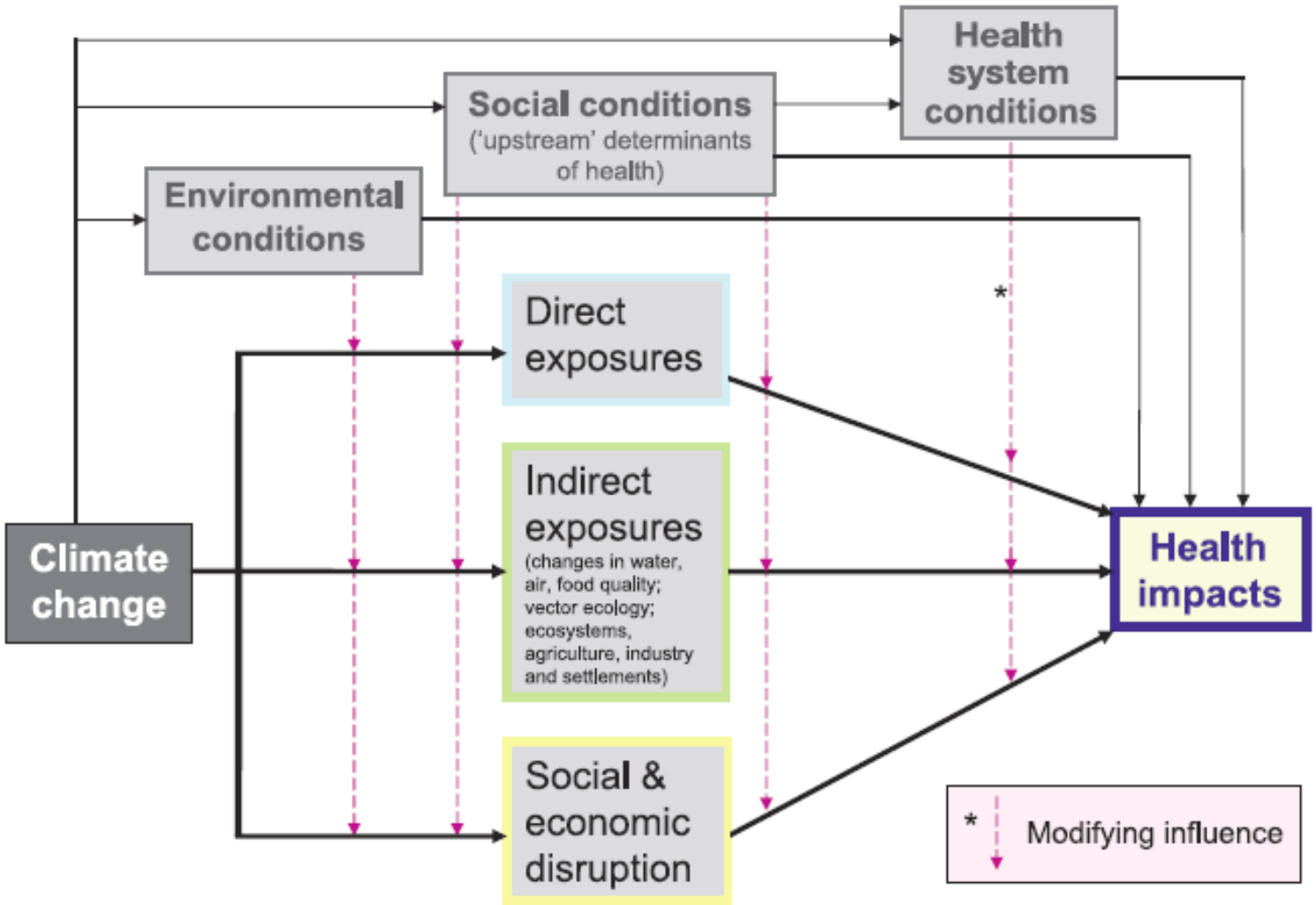
Transportation Fuels

- Europe:
  - Air pollution causes 6% of total mortality or more than 40,000 attributable cases per year.
  - About half of these deaths attributed to traffic emissions
  - Also, >25,000 new cases of chronic bronchitis (adults); more than 290,000 episodes of bronchitis (children); more than 500,000 asthma attacks; and more than 16 million person days of restricted activities.
  - Kunzli et al, Lancet Vol 356 September 2, 2000

Biofuels

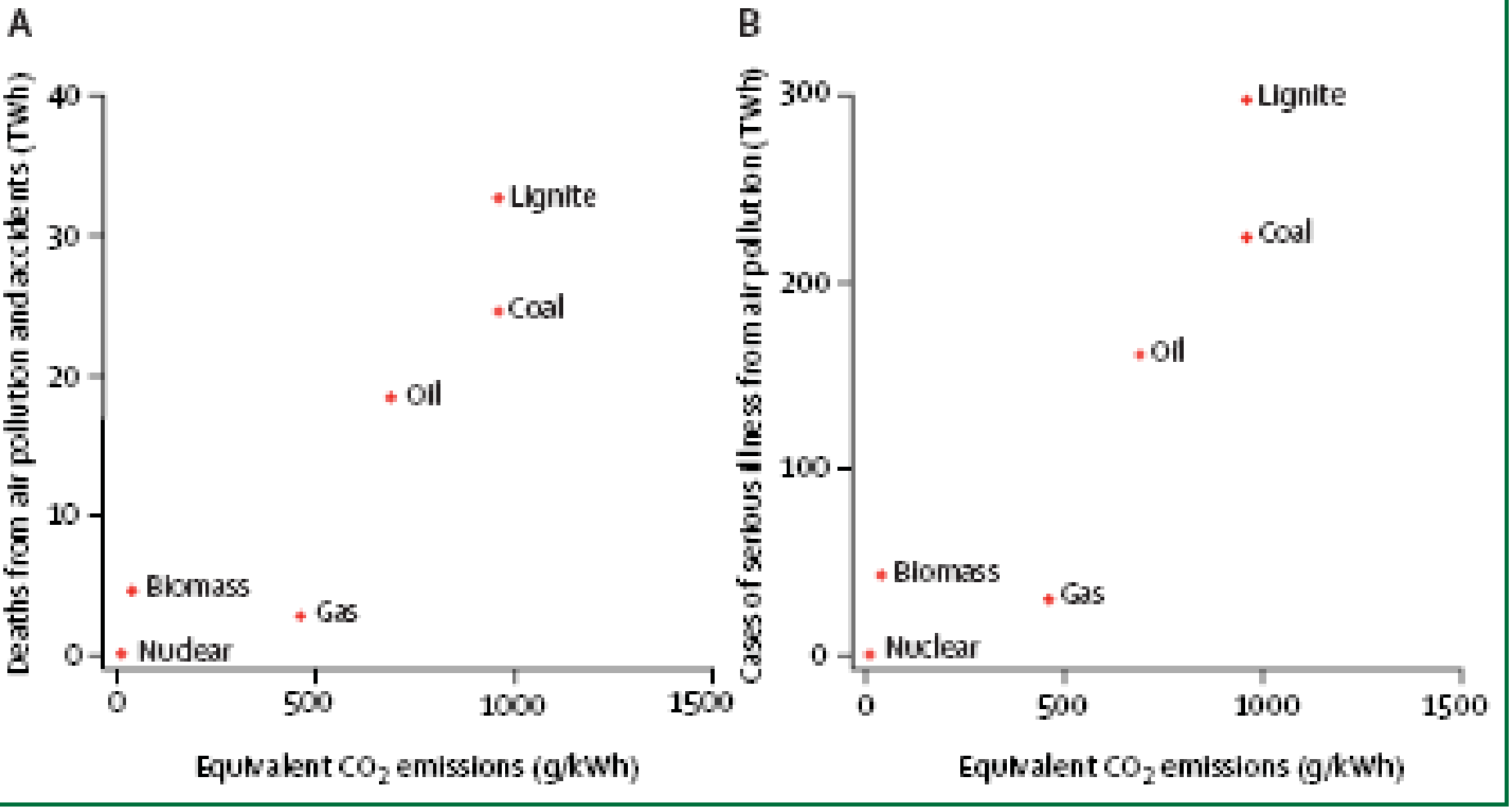
- Recent workshop (2007) by IOM Environmental Health Roundtable
- Issues with “first generation” biofuels
  - Not carbon neutral
  - Displace agricultural land and negatively impact food prices/production in vulnerable countries
  - Displace conservation reserves in US
  - Produce air pollutants (aldehydes) which may have health impacts
- “Second generation” biofuels may hold the promise of more efficiently producing fuel on non-agricultural lands….

Climate change and health



"Human health. Climate Change 2007: Impacts, Adaptation and Vulnerability." Contribution of Working Group II to the 4th Assessment Report of the IPCC

Fuel sources: health and sustainability



Markandia et al, Lancet, Vol 370 September 15, 2007

Mountaintop Mining in Appalachia

Oil Sands Extraction in Alberta

Coal Carbon Capture & Sequestration

New York Times, 21 Sep 2009

Searching for Solutions

- Access to electricity for all; distribute clean energy resources to those in greatest need.
- Move to a low-carbon low-energy transportation system—increased walking, cycling, and public transport.
- Adopt nuclear energy technologies as a transition between fossil fuels and more renewable sources of energy.
- Search for clean and reliable renewables: solar, wind, possibly second generation biofuels; carefully assess health impacts of alternatives
- Change our urban infrastructure. Build more efficiently heated, lit, and air-conditioned homes and retrofit older ones; include renewable energy technologies in new buildings.
- Reduce meat consumption.
- Make far stronger links between development, energy, and health.
- Recognize national security issues; energy requirements are sources of international tension, conflict and political instabilities that threaten health in every way.