



AIR POLLUTION AND HEALTH

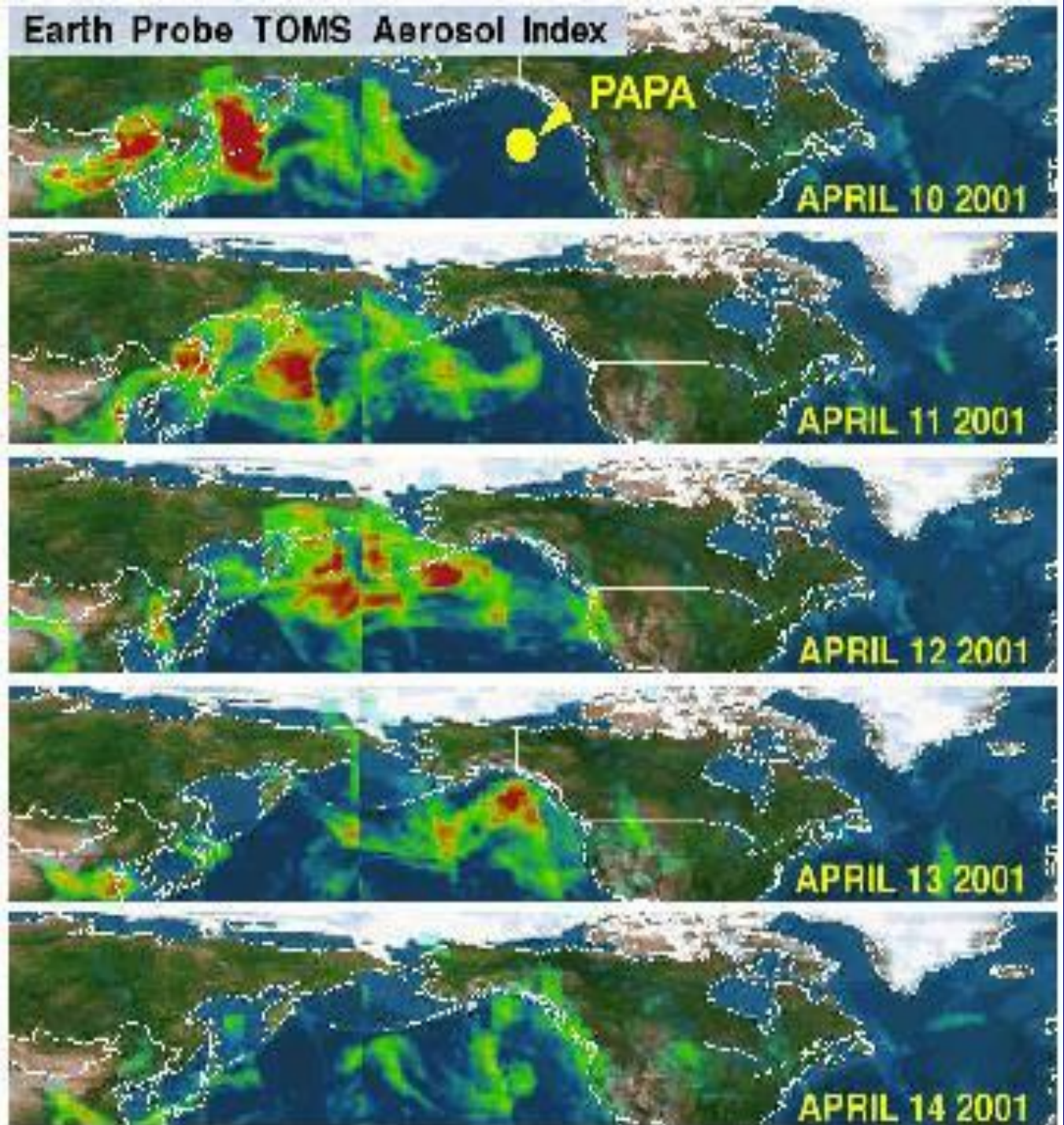
George D. Thurston, ScD.

Professor

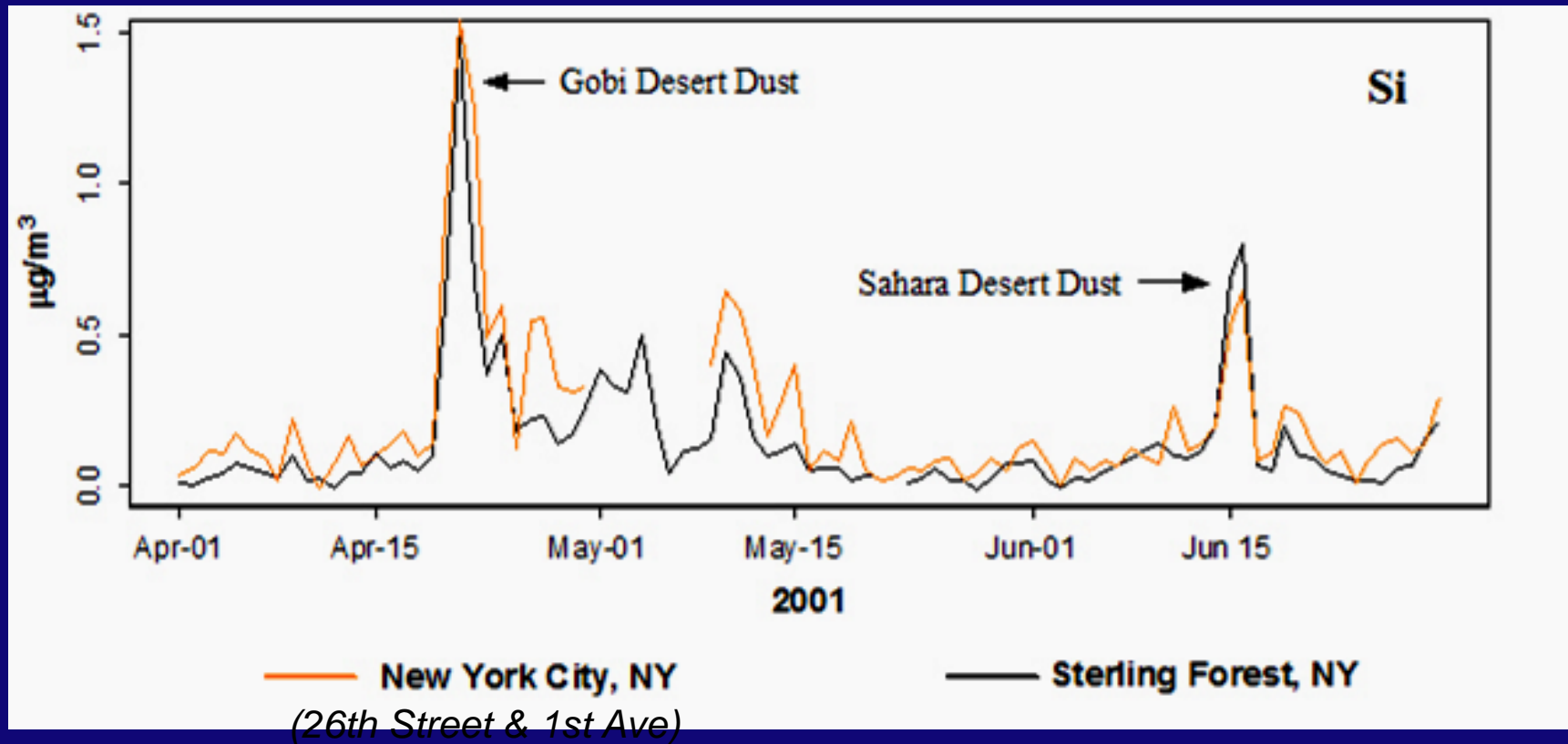
NYU School of Medicine

**Pollution
Travels Long
Distances:**

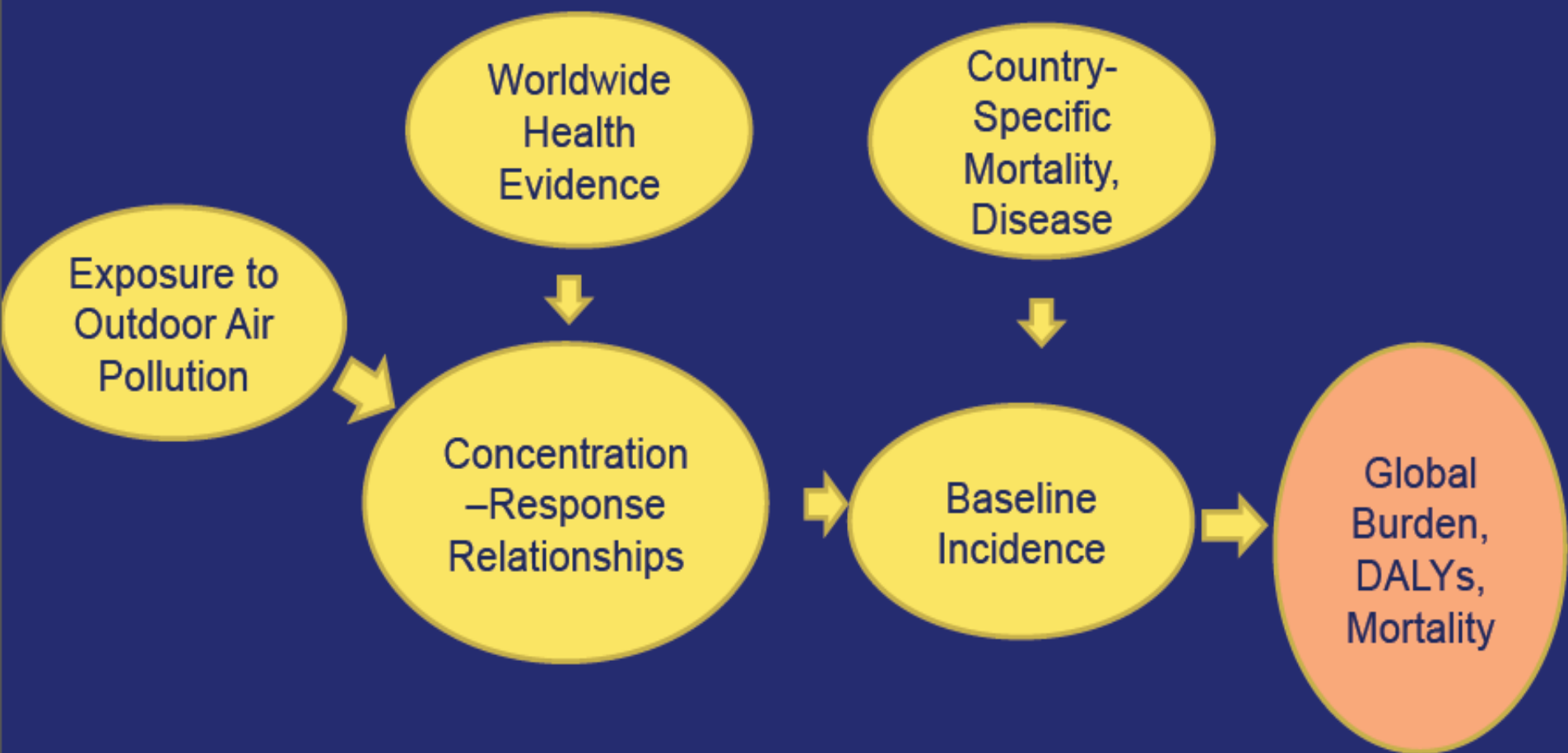
*NASA Satellite
Images of the Gobi
Desert Dust Plume
being Transported
Across the North
Pacific and into the
U.S.*



Trans-Ocean Transport: Chinese Desert Dust Particles Travelled All the Way to NYC

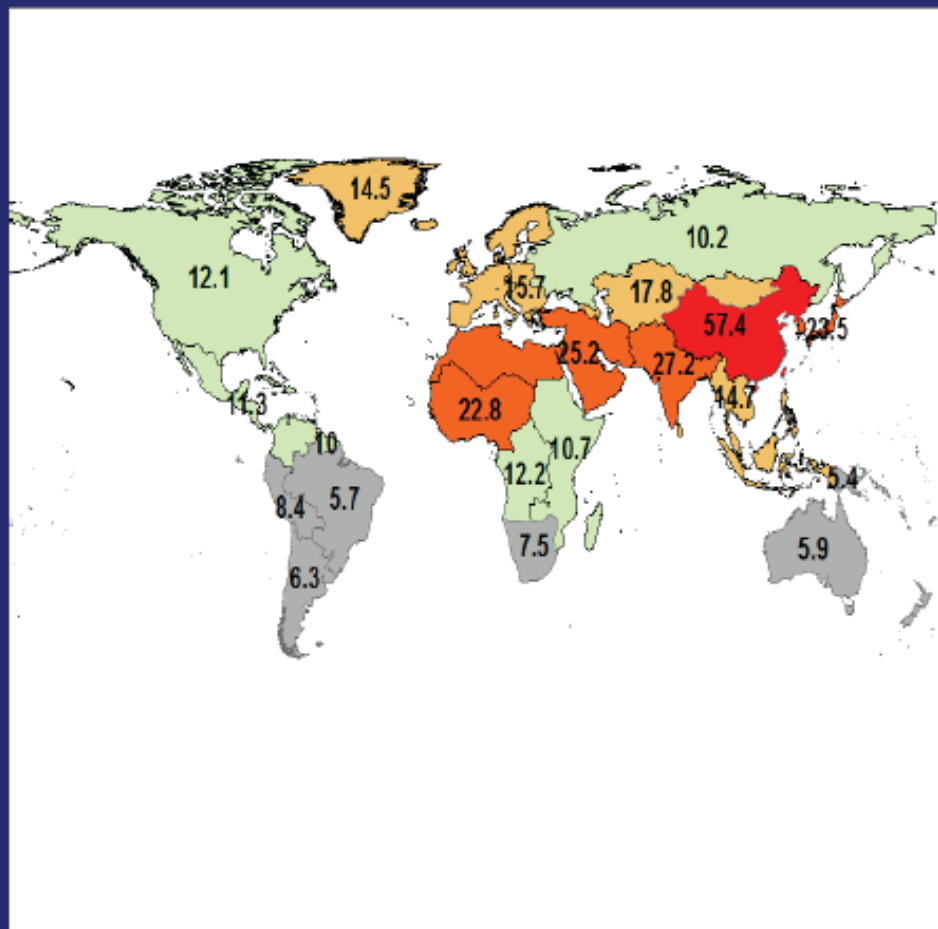


Estimating the Global Burden of Disease due to Ambient Air Pollution



Exposure Assessment for Estimation of the Global Burden of Disease Attributable to Outdoor Air Pollution

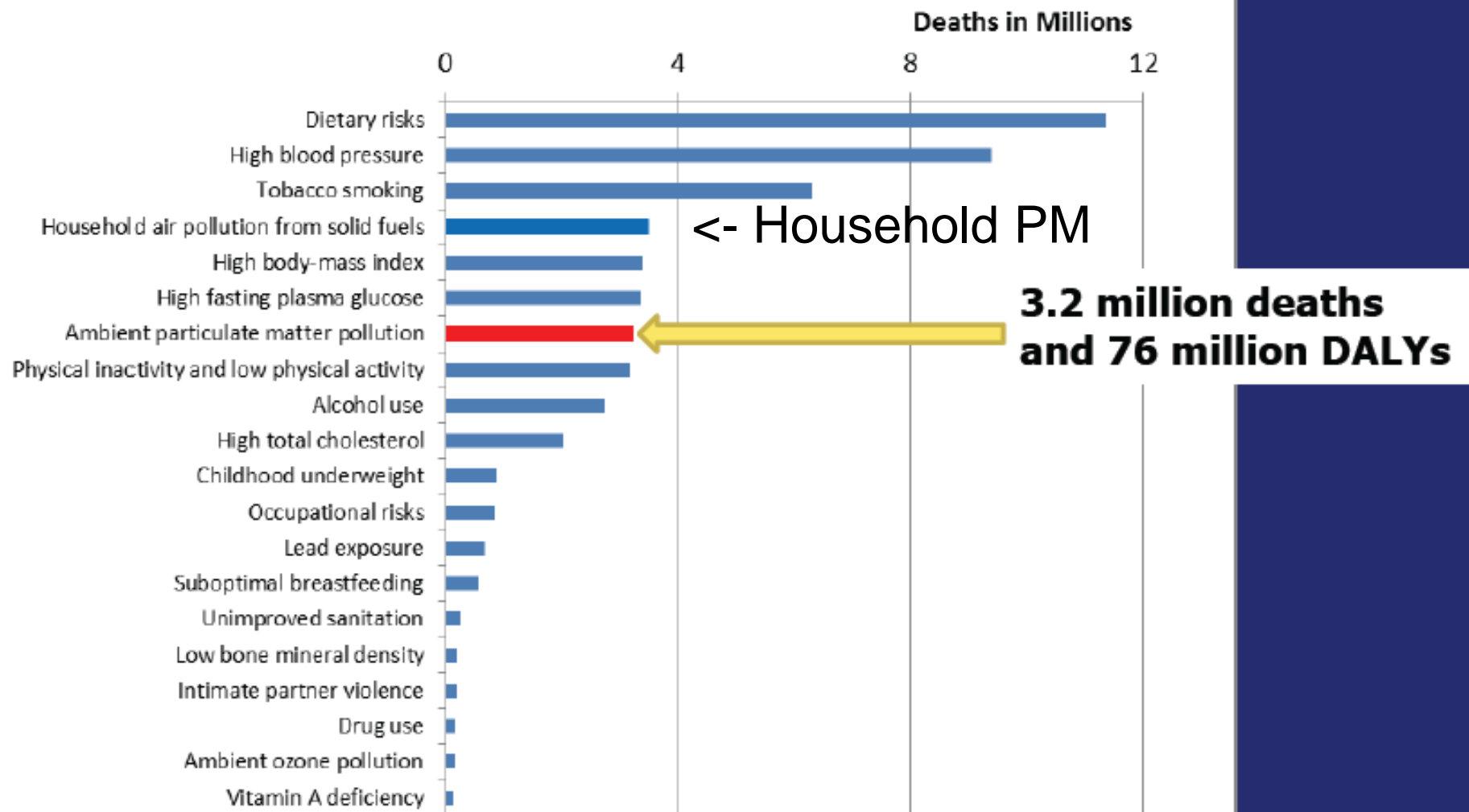
Michael Brauer,^{*,†} Markus Amann,[‡] Rick T. Burnett,[§] Aaron Cohen,^{||} Frank Dentener,⁺ Majid Ezzati,[#] Sarah B. Henderson,[∇] Michal Krzyzanowski,[○] Randall V. Martin,^{◆,¶} Rita Van Dingenen,⁺ Aaron van Donkelaar,[◆] and George D. Thurston⁺



2005 population-weighted regional estimated average PM_{2.5}

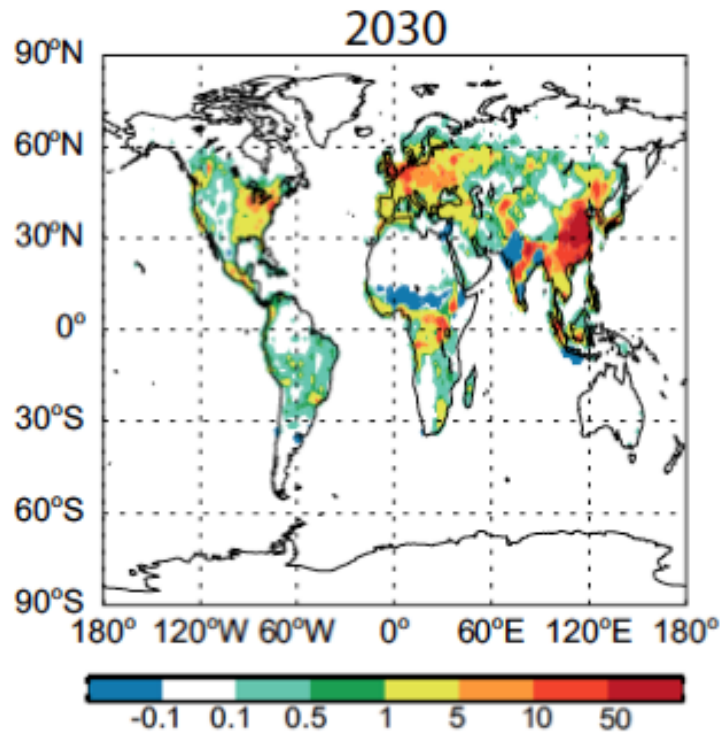
- **Global estimates of PM_{2.5} at 10km x 10km scale**
- **Combined estimates from satellites (AOD), chemical transport models and ground-level measurements**
- **Highest regional averages in East /South Asia - many breathe concentrations much higher than regional average**
- **89% population in areas exceeding WHO Air Quality Guideline (10 µg/m³ PM_{2.5} annual average)**

Ambient PM_{2.5} among the leading global risks for mortality and lost years of healthy life in 2010



Health Co-Benefits of Climate Mitigation Can Be Large if Fossil Fuel Combustion Reduced

a.) Health Benefits



b.) Economic Benefits

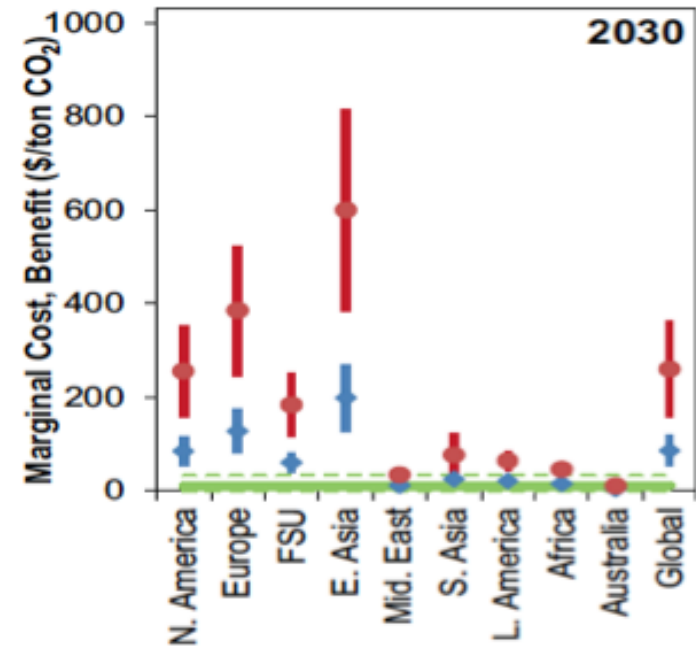


Figure 1. The Health and Associated Economic Benefits of Climate Change Mitigation⁴ a.) the premature mortality (due to Cardio-Pulmonary Disease, CPD, plus lung cancer) from PM_{2.5} in 2030 (deaths per year per 1000 km²) avoided by climate change mitigation measures; b.) the range of associated marginal benefits (\$/ton CO₂) by region (Red: High Estimate, Blue: Low Estimate), relative to the range of expected mitigation cost (Green lines) achieved by climate change mitigation. Reproduced from West et al.