

Cities, Resiliency and Human Health

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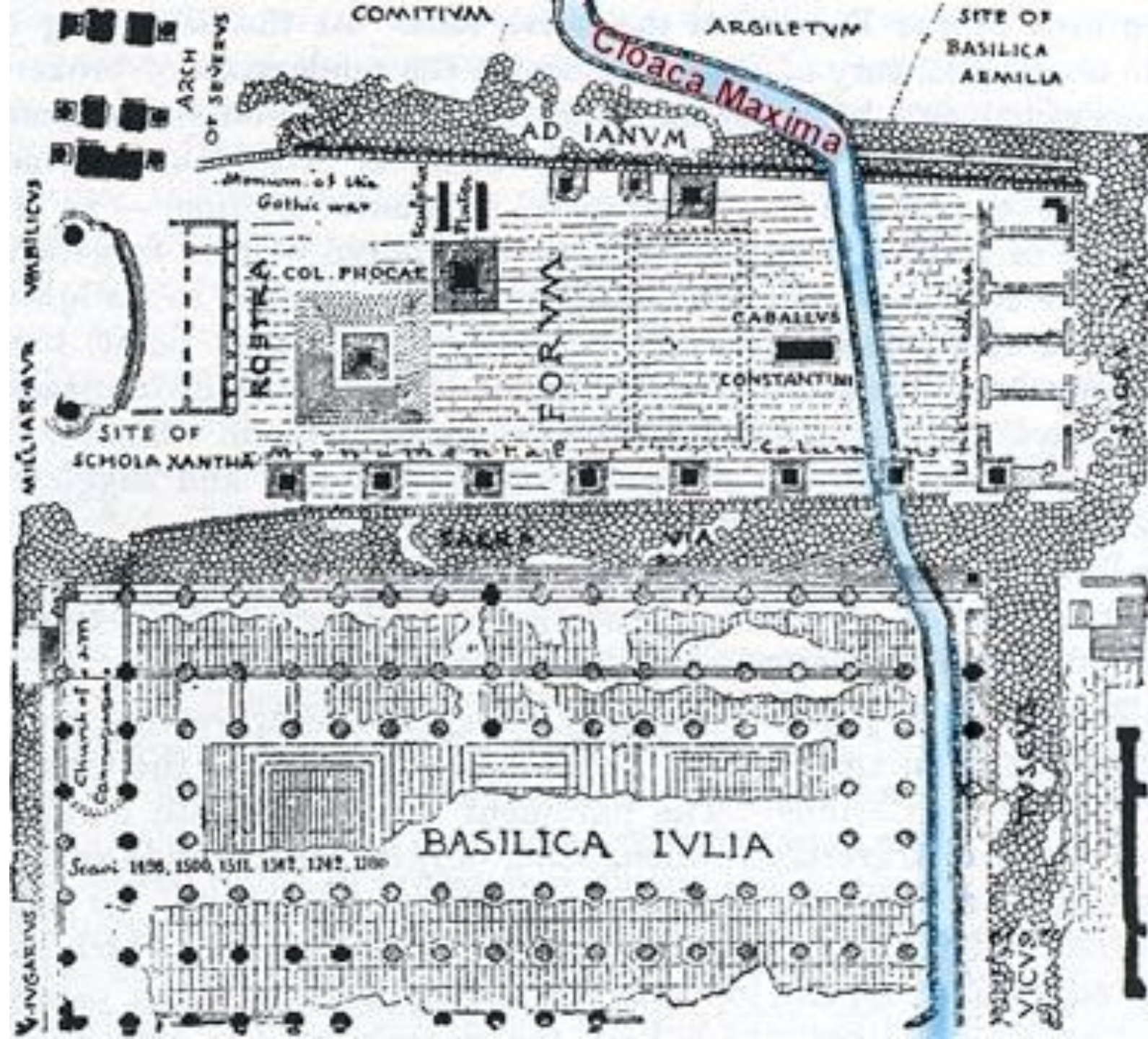
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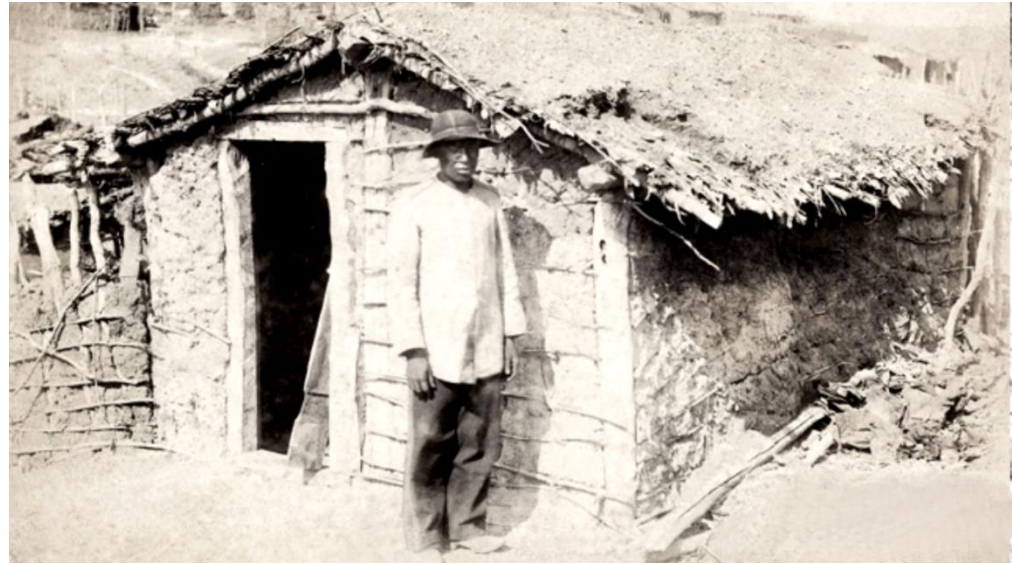


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Cities are the future

Rapid urbanization is
overtaxing the planet, but it
may not have to

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The illustration depicts a horizontal line representing a city skyline. On the left, there is a DNA double helix, a building with a satellite dish, and a tall skyscraper with a grid pattern. In the center, there are various laboratory glassware including test tubes, a round-bottom flask, a pipette, and a large Erlenmeyer flask. On the right, there is a radio tower with signal waves, a microscope, and a truck. Below the skyline, there is a road with a car, a tree, and another truck. The background is dark with small colorful dots.

SCIENCE AND THE CITY

More than half of humanity now lives in cities, and the urban population is swelling by a million people each week. That concentration of people gives rise to some of the world's greatest problems, but also to its greatest innovations. *Nature* examines the special relationship between scientists and cities and how each can bring out the best in the other.

Image Credit: Oliver Munday

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


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Use of science to guide city planning policy and practice: how to achieve healthy and sustainable future cities

Prof [James F Sallis, PhD](#), Prof [Fiona Bull, PhD](#), Prof [Ricky Burdett, MSc](#), Prof [Lawrence D Frank, PhD](#), [Peter Griffiths, MSc](#), Prof [Billie Giles-Corti, PhD](#), Prof [Mark Stevenson, PhD](#)

Published: 23 September 2016

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Urban design, transport, and health 1



City planning and population health: a global challenge

Billie Giles-Corti, Anne Vernez-Moudon, Rodrigo Reis, Gavin Turrell, Andrew L Dannenberg, Hannah Badland, Sarah Foster, Melanie Lowe, James F Sallis, Mark Stevenson, Neville Owen

Significant global health challenges are being confronted in the 21st century, prompting calls to rethink approaches to disease prevention. A key part of the solution is city planning that reduces non-communicable diseases and road trauma while also managing rapid urbanisation. This Series of papers considers the health impacts of city planning through transport mode choices. In this, the first paper, we identify eight integrated regional and local interventions that, when combined, encourage walking, cycling, and public transport use, while reducing private motor vehicle use. These interventions are destination accessibility, equitable distribution of employment across cities, managing demand by reducing the availability and increasing the cost of parking, designing pedestrian-friendly and cycling-friendly movement networks, achieving optimum levels of residential density, reducing distance to public transport, and enhancing the desirability of active travel modes (eg, creating safe attractive neighbourhoods and safe, affordable, and convenient public transport). Together, these interventions will create healthier and more sustainable compact cities that reduce the environmental, social, and behavioural risk factors that affect lifestyle choices, levels of traffic, environmental pollution, noise, and crime. The health sector, including health ministers, must lead in advocating for integrated multisector city planning that prioritises health, sustainability, and liveability outcomes, particularly in rapidly changing low-income and middle-income countries. We recommend establishing a set of indicators to benchmark and monitor progress towards achievement of more compact cities that promote health and reduce health inequities.

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This is the first in a [Series](#) of three papers about urban design, transport, and health

University of Melbourne, Melbourne, VIC, Australia (Prof B Giles-Corti PhD, H Badland PhD, M Lowe PhD, Prof M Stevenson PhD); University of Washington, Seattle, WA, USA (Prof A Vernez-Moudon Dr è Prof A L Dannenberg MD); Pontifical Catholic University of Parana, Parana, Brazil (Prof R Reis PhD); Washing

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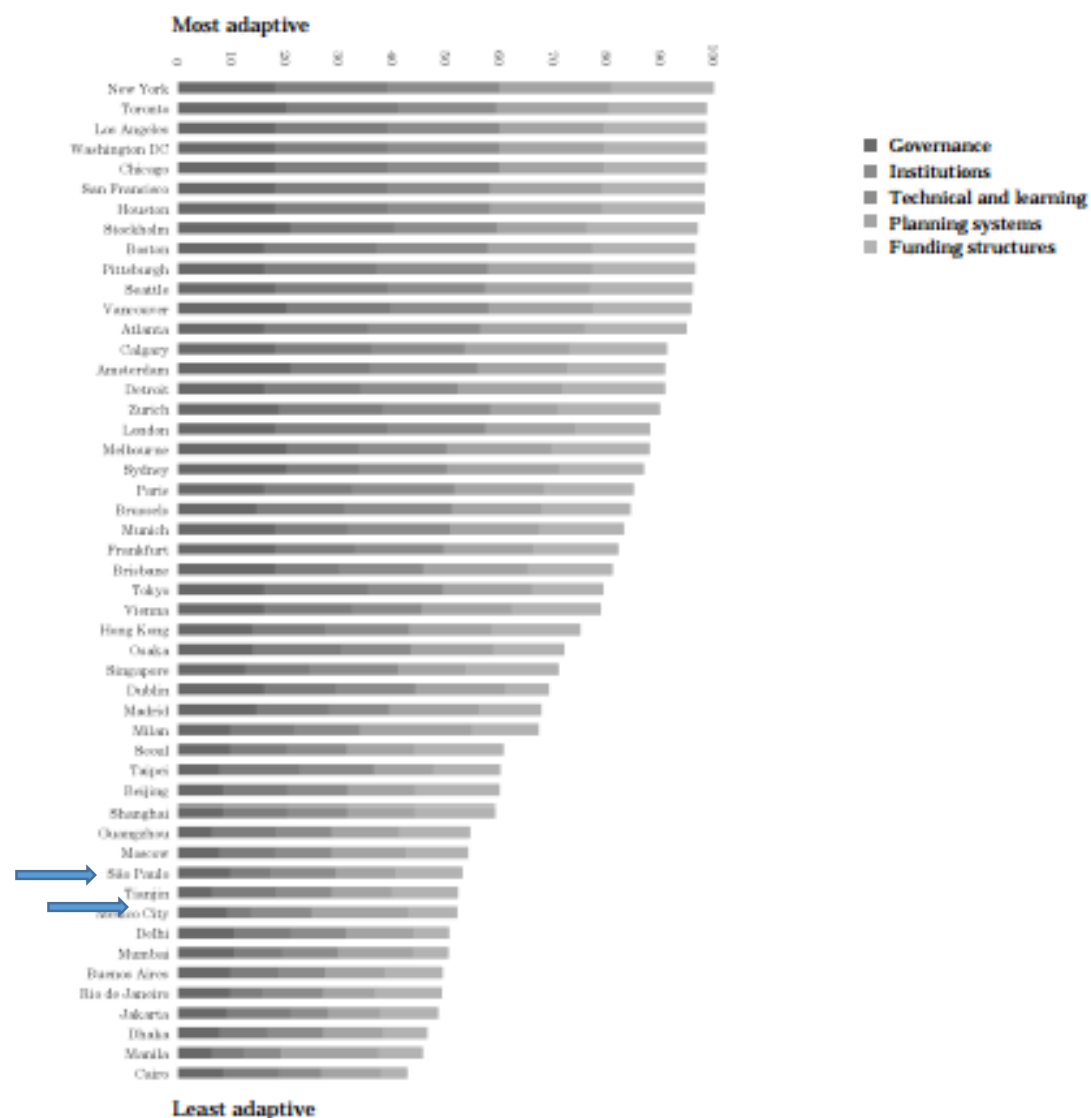
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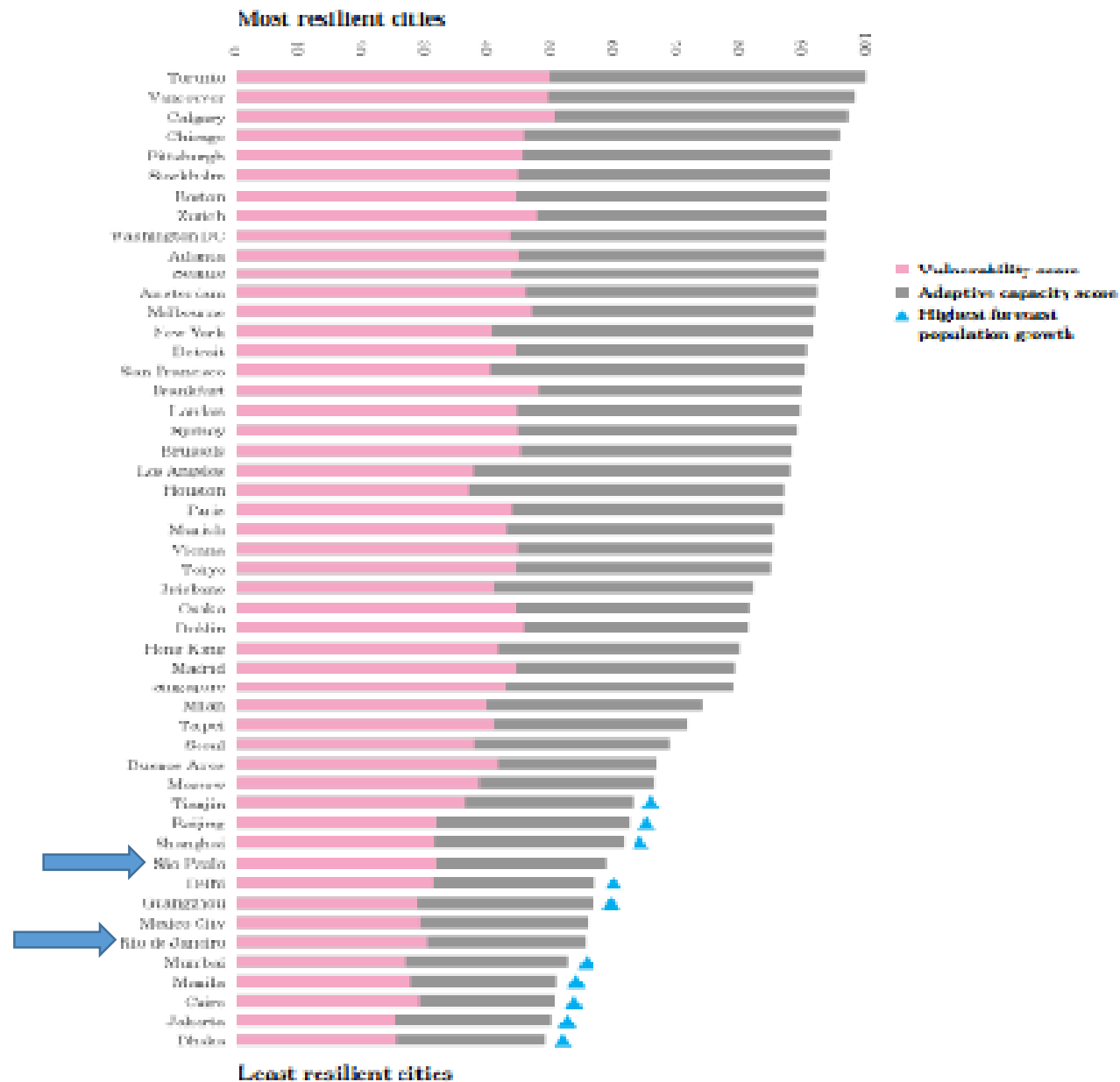
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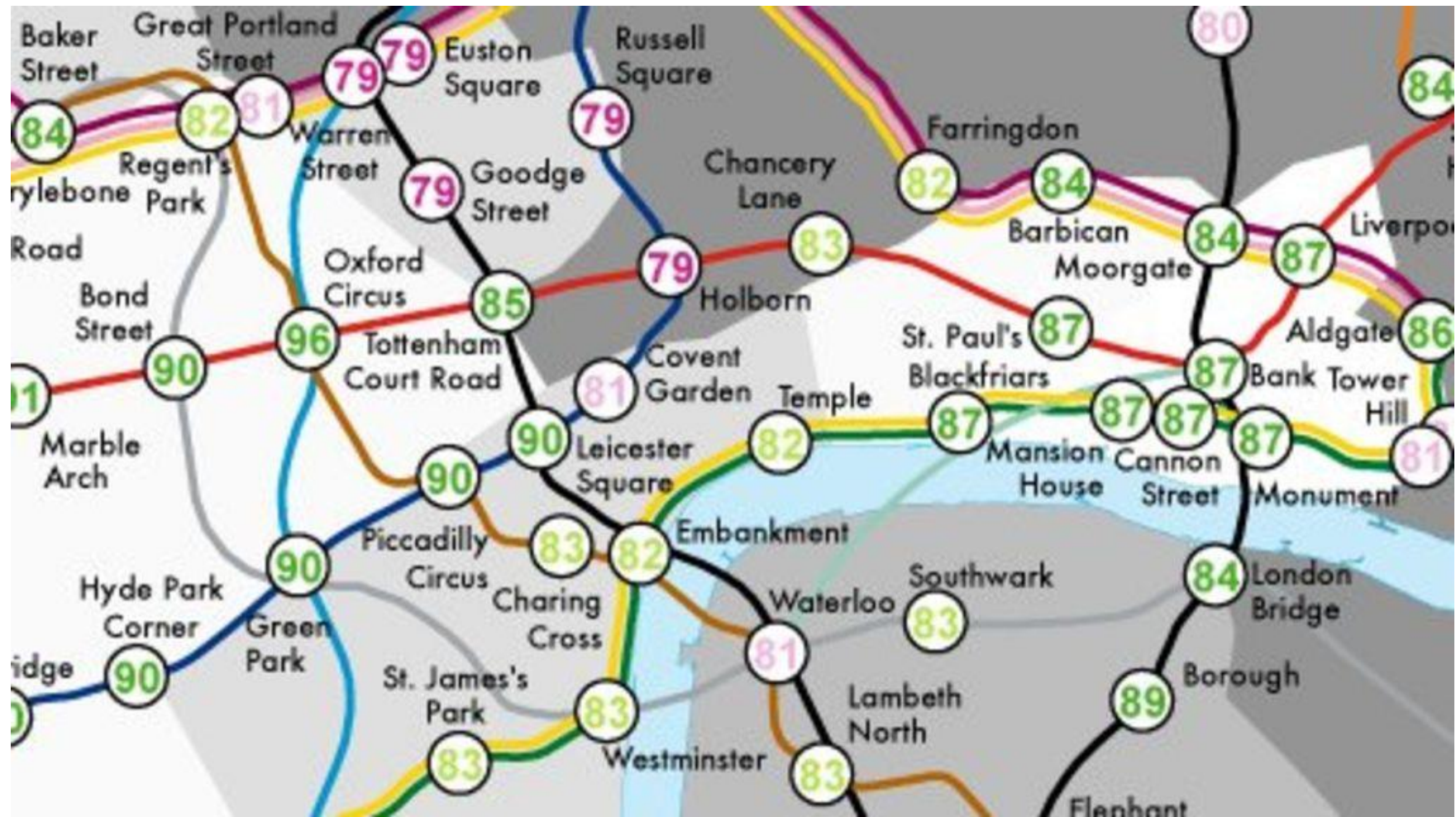
Vulnerability: world city ranking

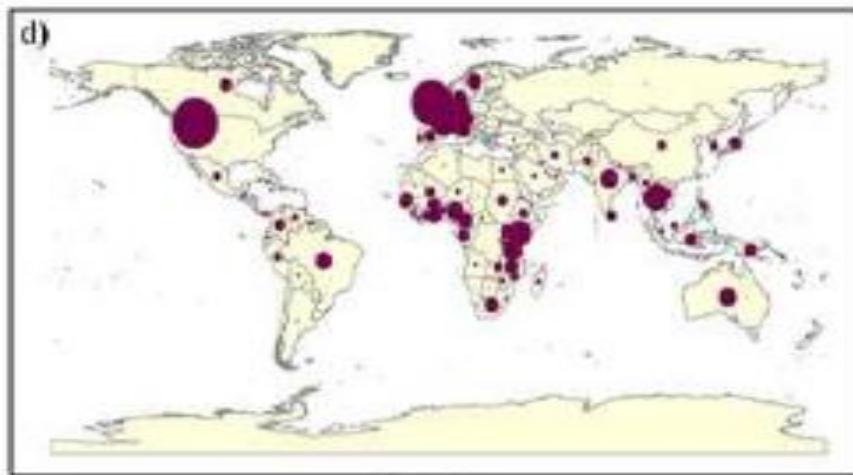
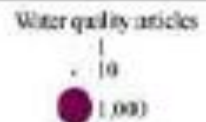
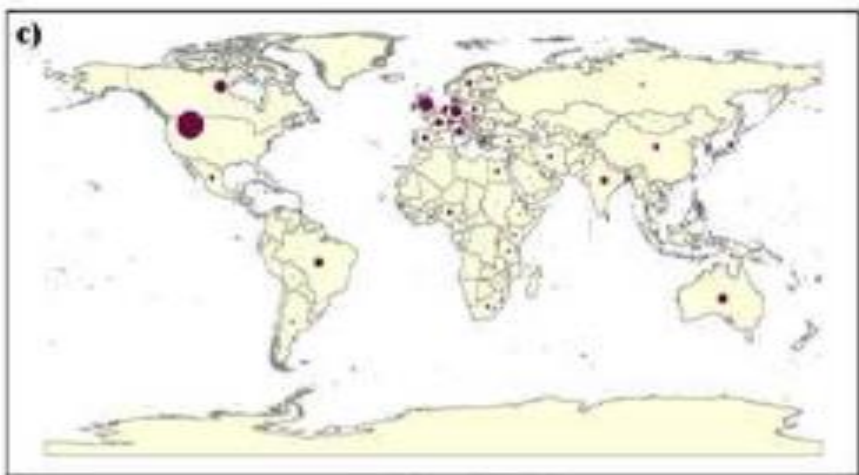
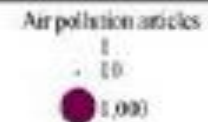
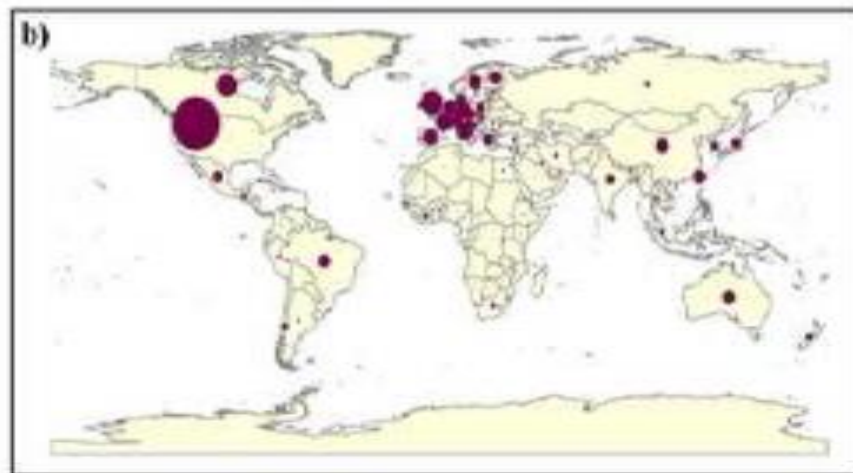
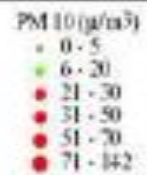
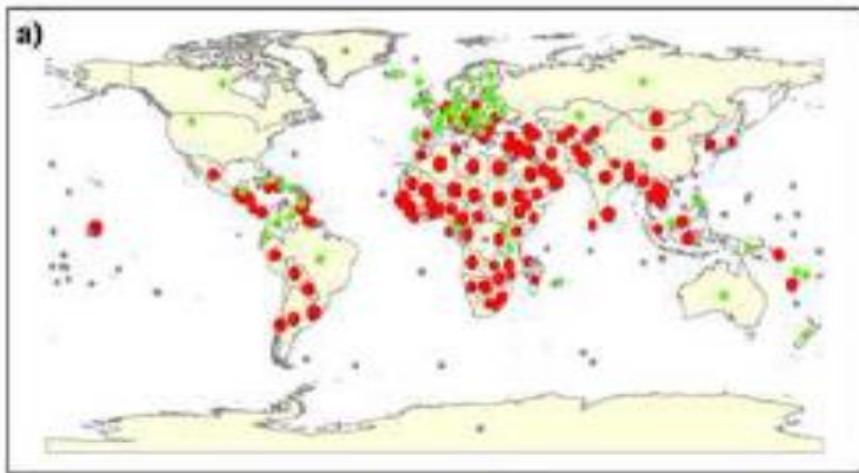


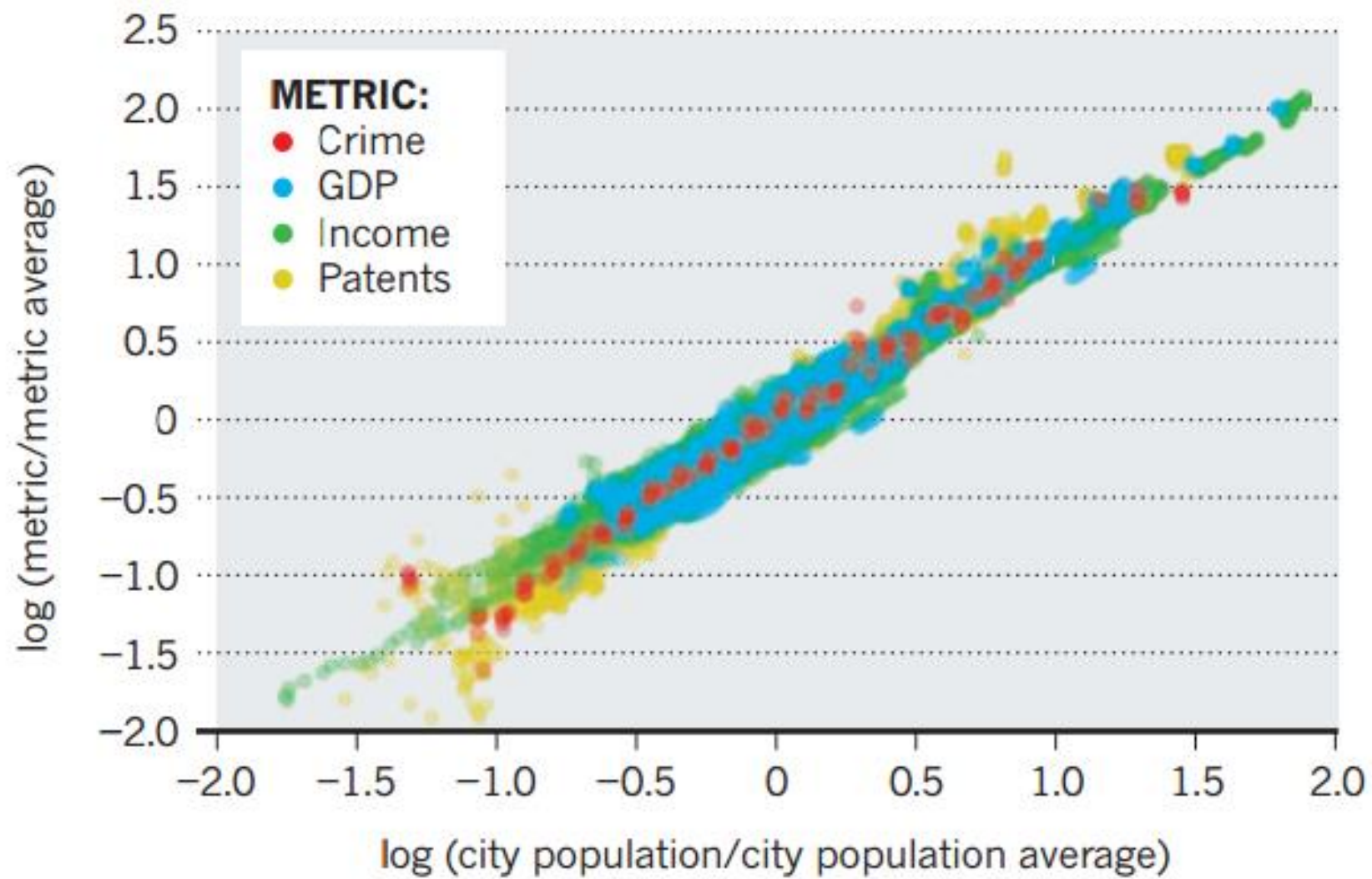
Adaptive capacity: world city ranking

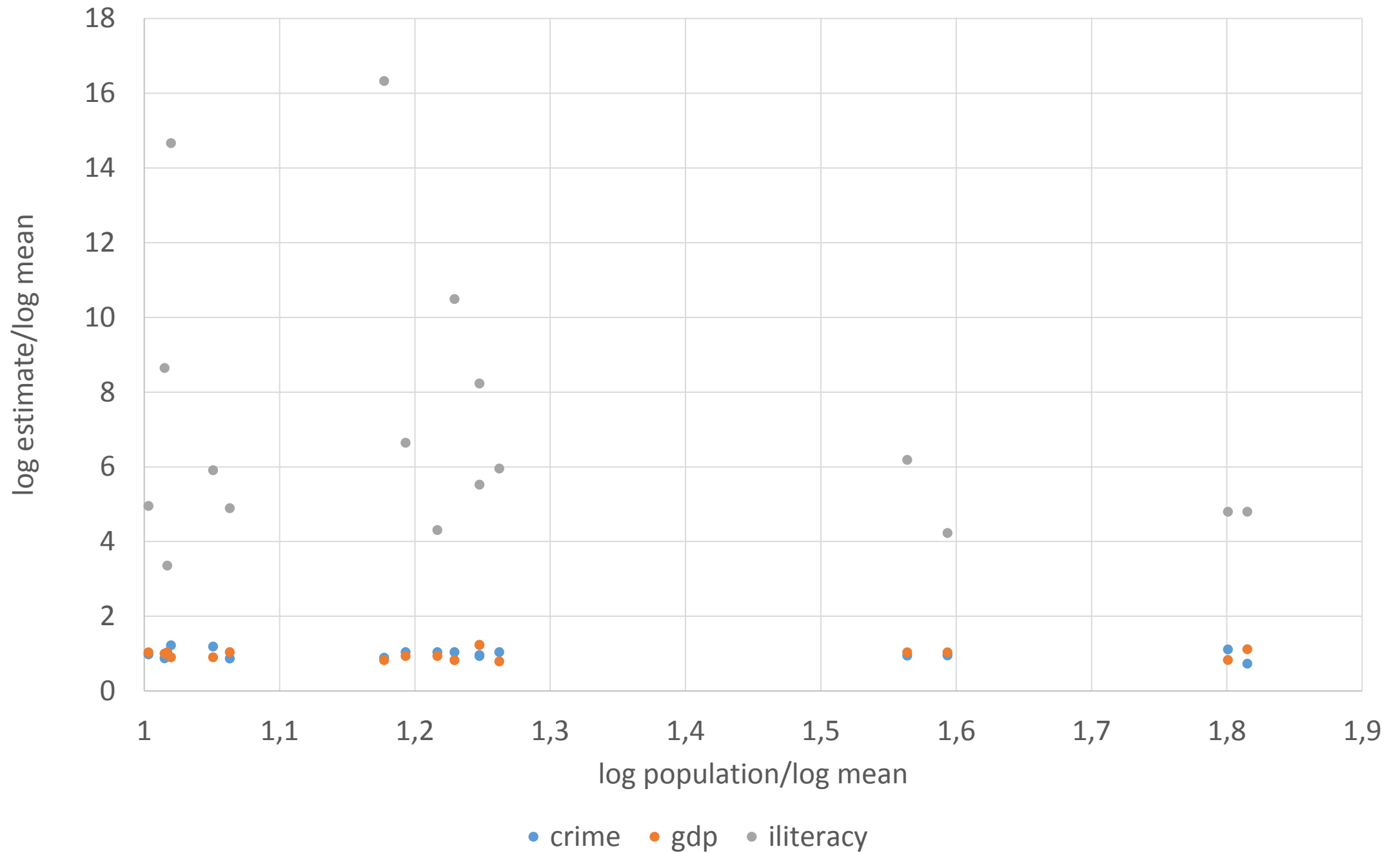


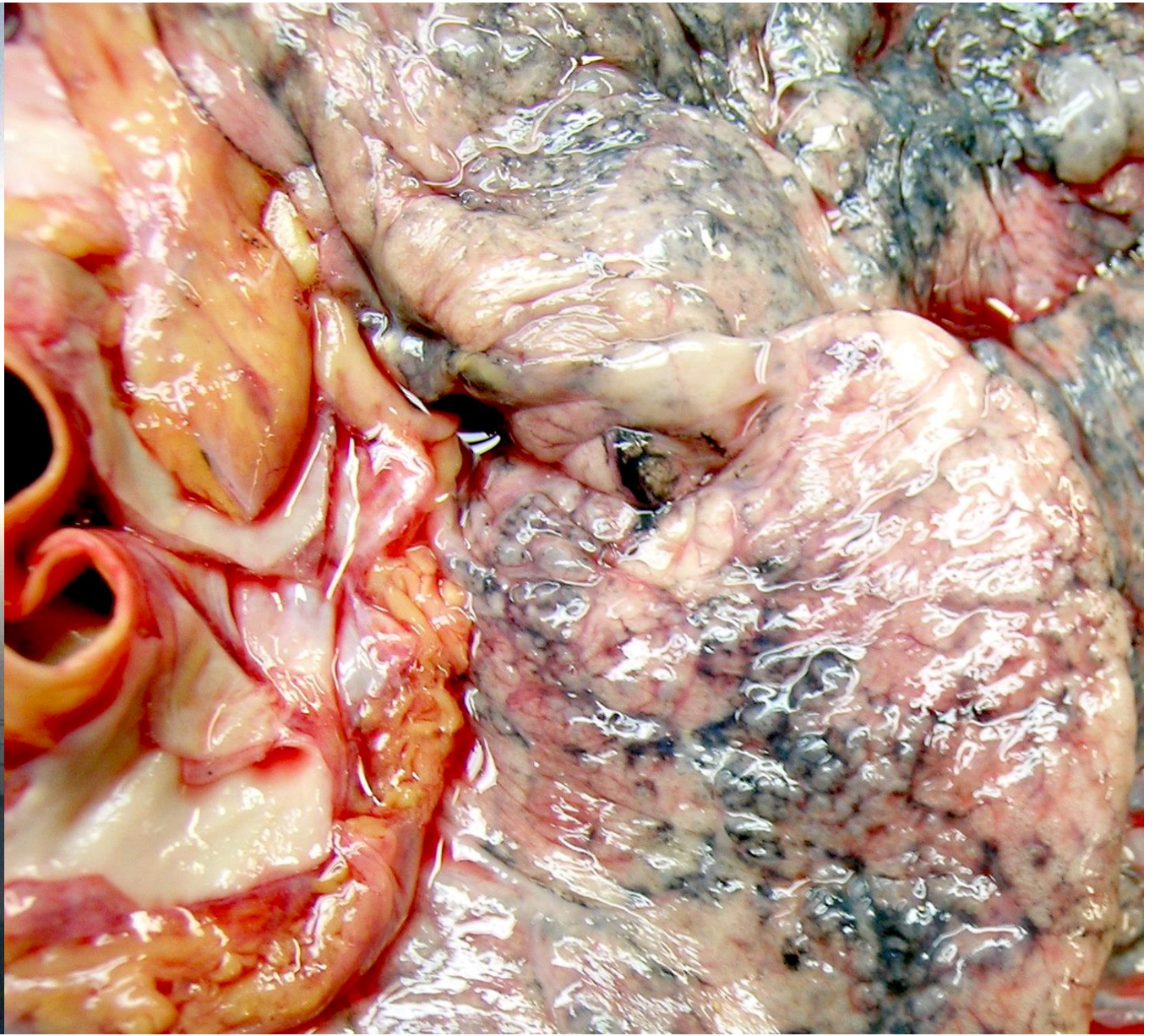


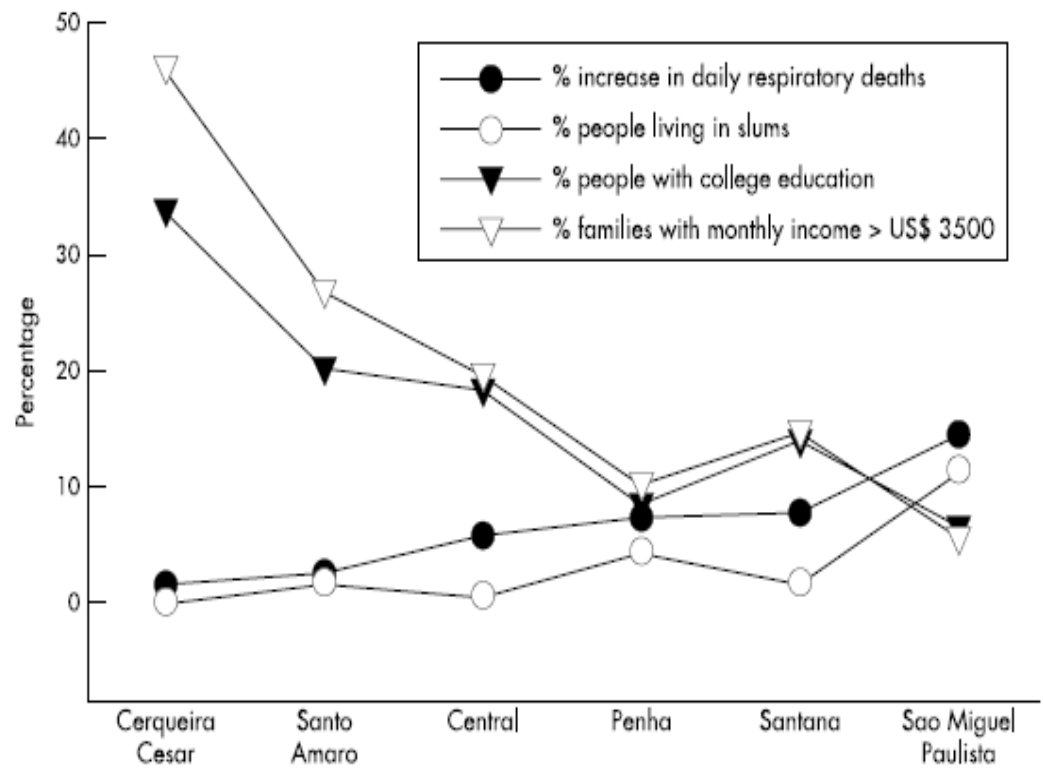


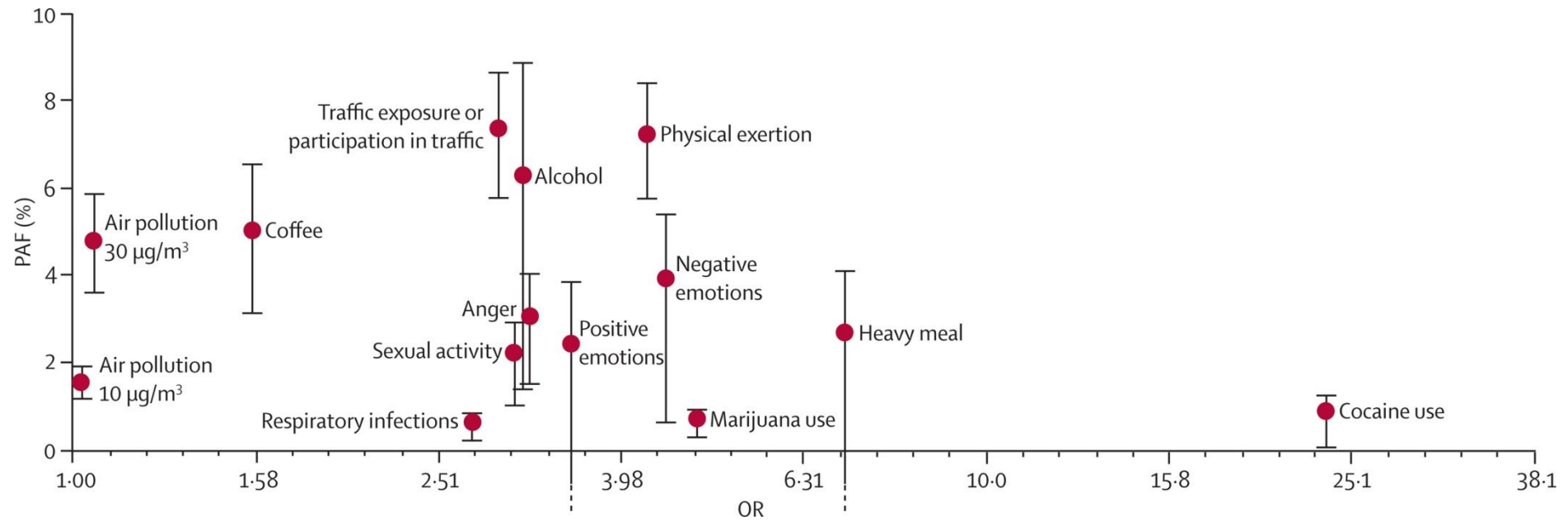






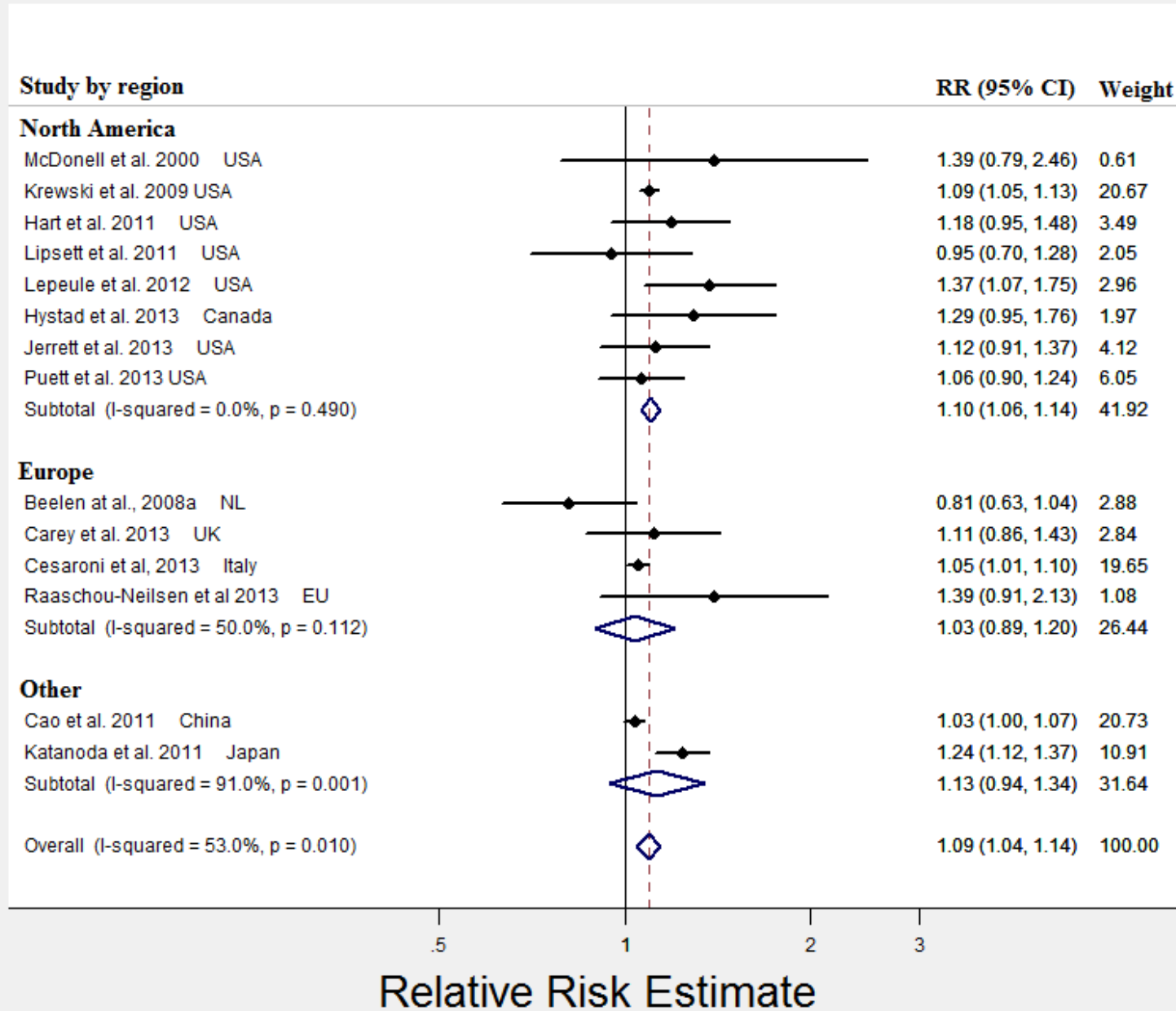






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Lung Cancer and PM2.5 Meta-Analysis



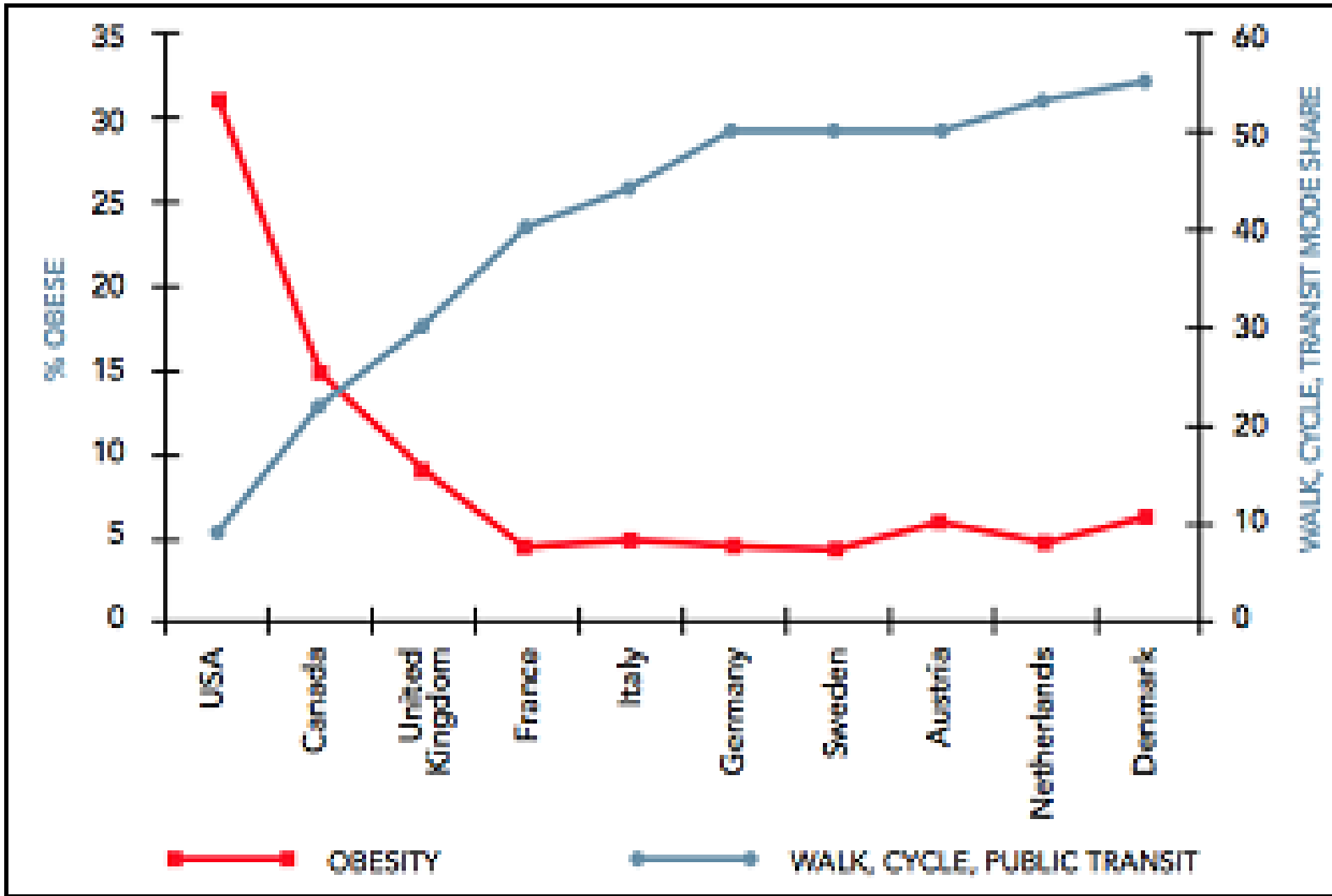
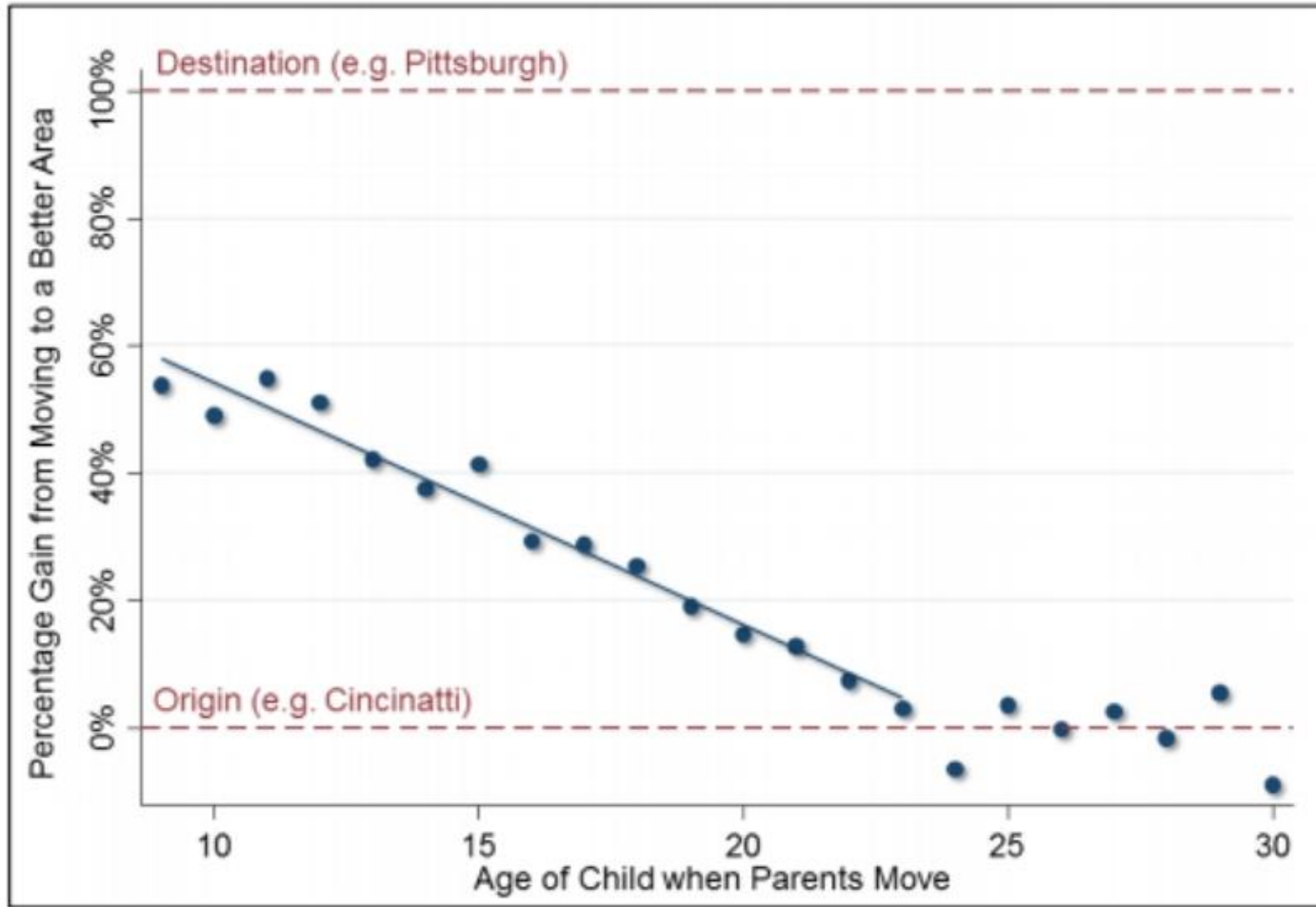


Figure 1: Population-level relationship between obesity and combined walking, cycling, and transit mode share

Source: Transport Canada (2010), data from Basset et al. (2008)

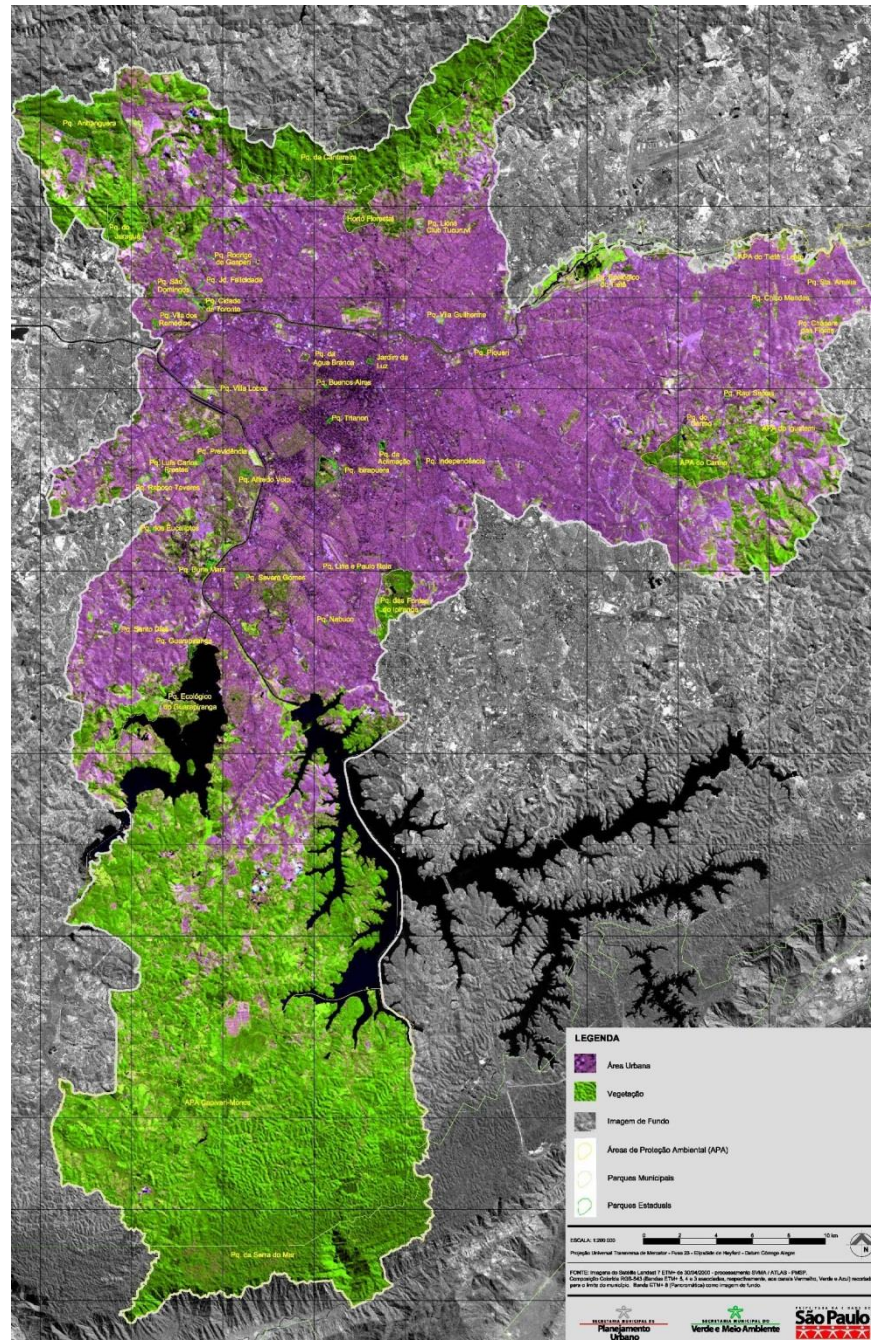
FIGURE 1

Effects of Moving to a Different Neighborhood on a Child's Income in Adulthood



Notes: This figure plots the percentage gain from moving to a better area by the age at which the child moves. For example, children who move at age 9 have outcomes that are about 50% between the outcomes of children who grow up permanently in the origin and destination areas.

The Impacts of Neighborhoods on Intergenerational Mobility
Childhood Exposure Effects and County-Level Estimates
Raj Chetty and Nathaniel Hendren, Harvard University





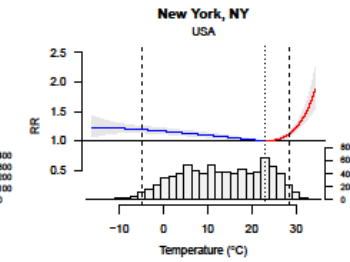
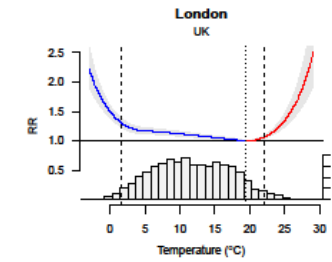
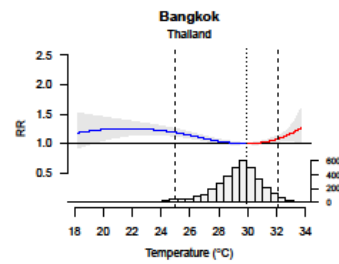
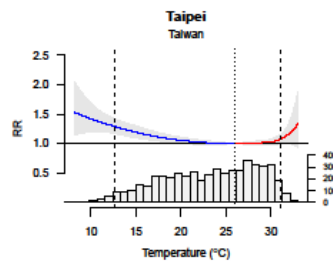
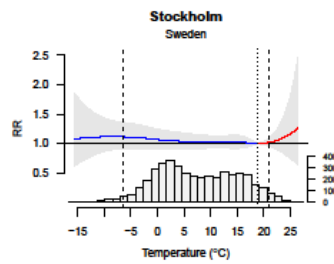
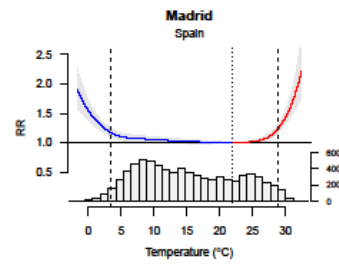
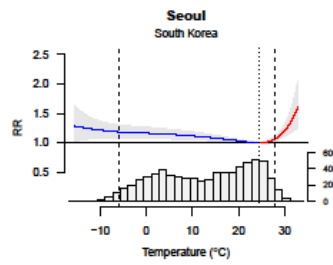
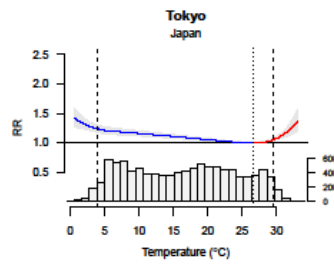
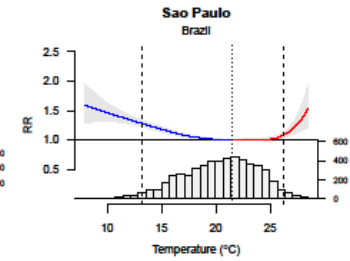
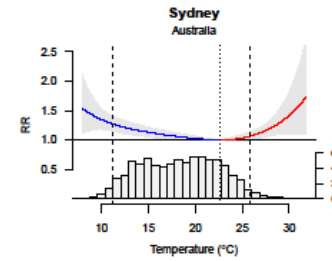
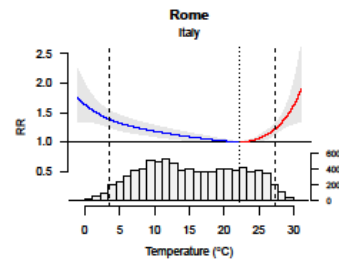
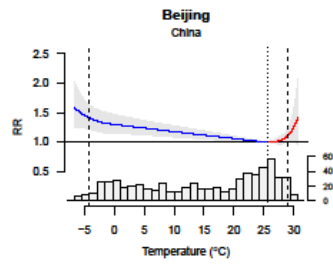
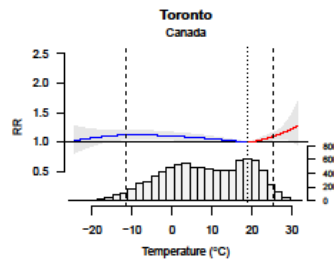
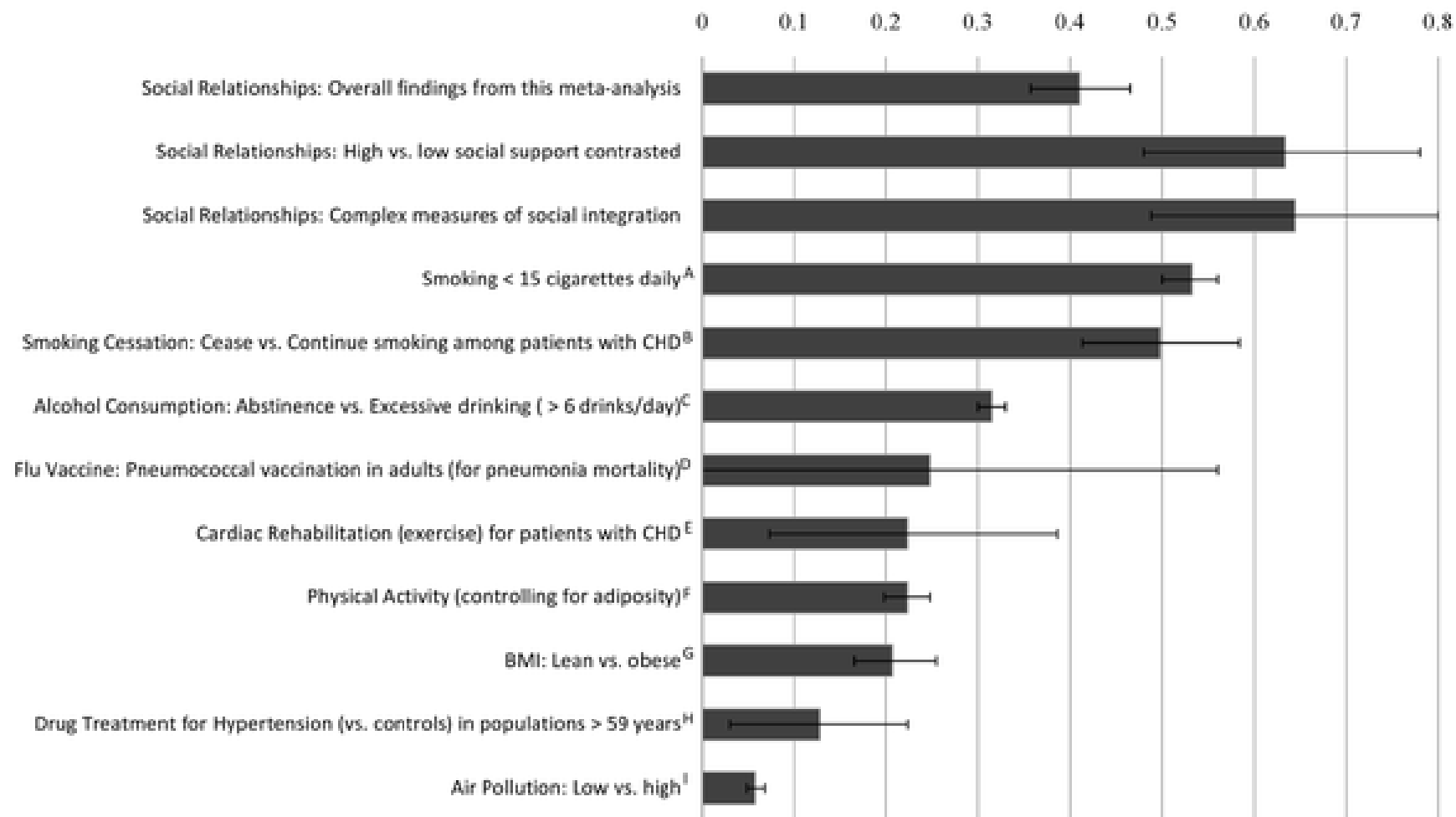






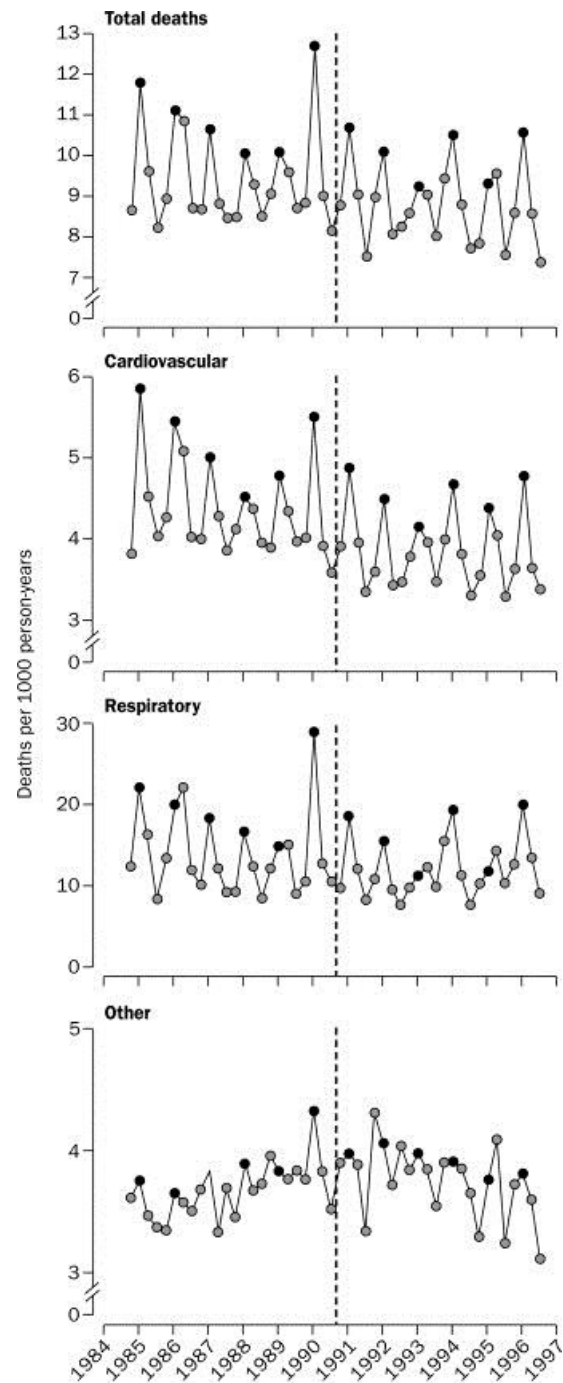
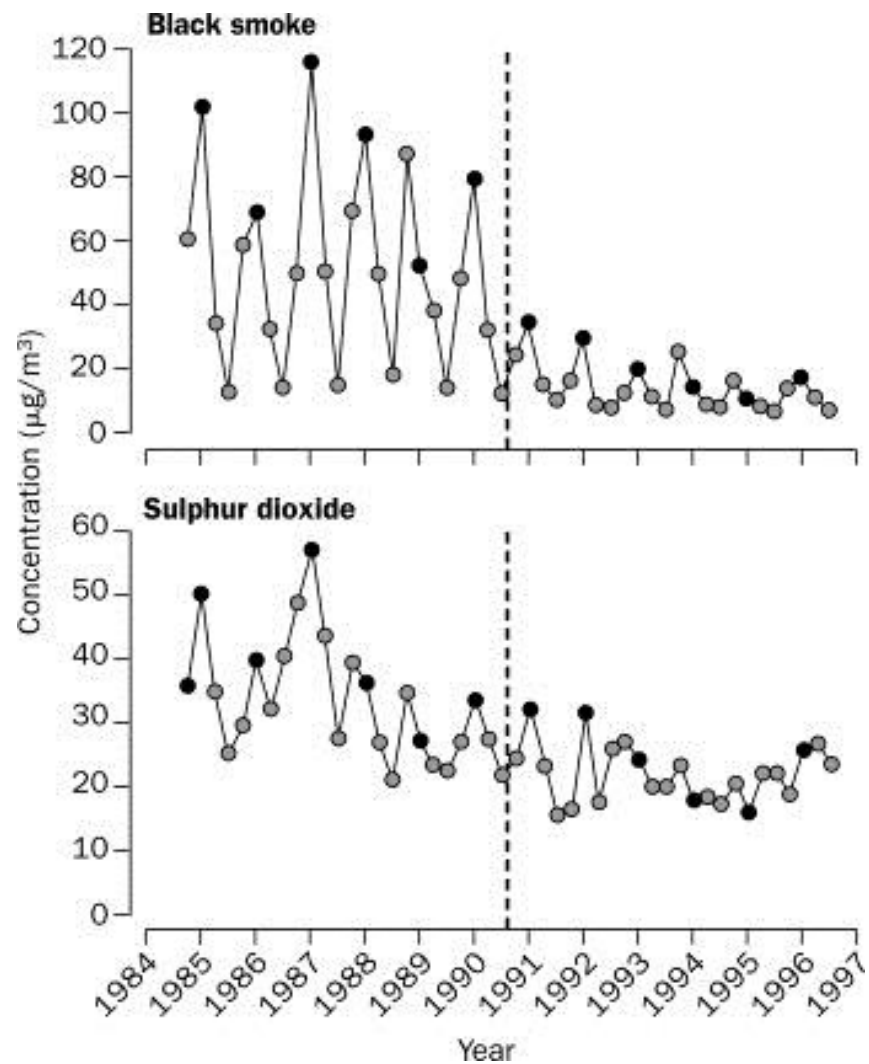
Figure 6. Comparison of odds (lnOR) of decreased mortality across several conditions associated with mortality.



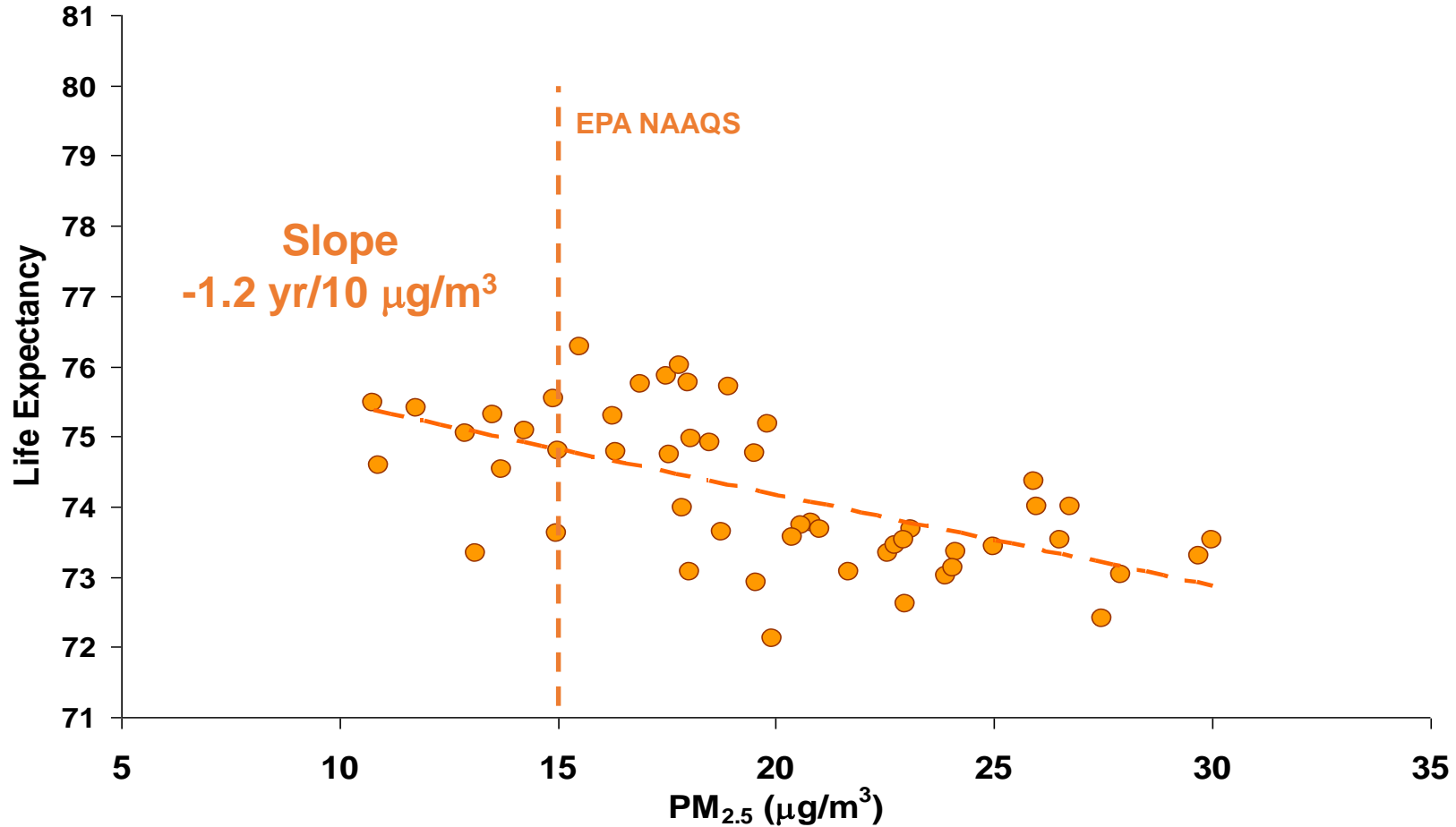
Holt-Lunstad J, Smith TB, Layton JB (2010) Social Relationships and Mortality Risk: A Meta-analytic Review. PLoS Med 7(7): e1000316.

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<http://127.0.0.1:8081/plosmedicine/article?id=info:doi/10.1371/journal.pmed.1000316>

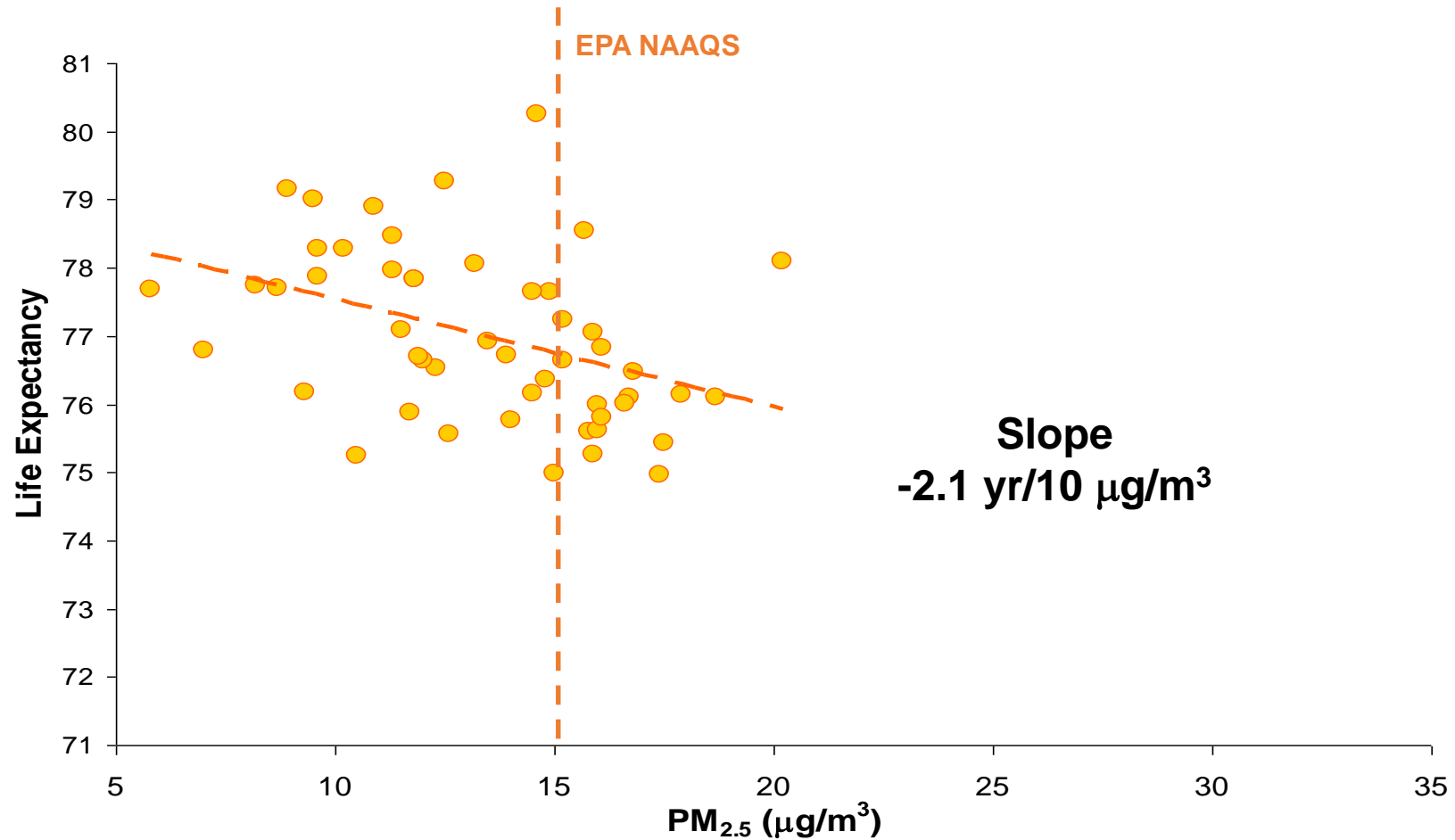


Life Expectancy vs PM_{2.5} 1978-82



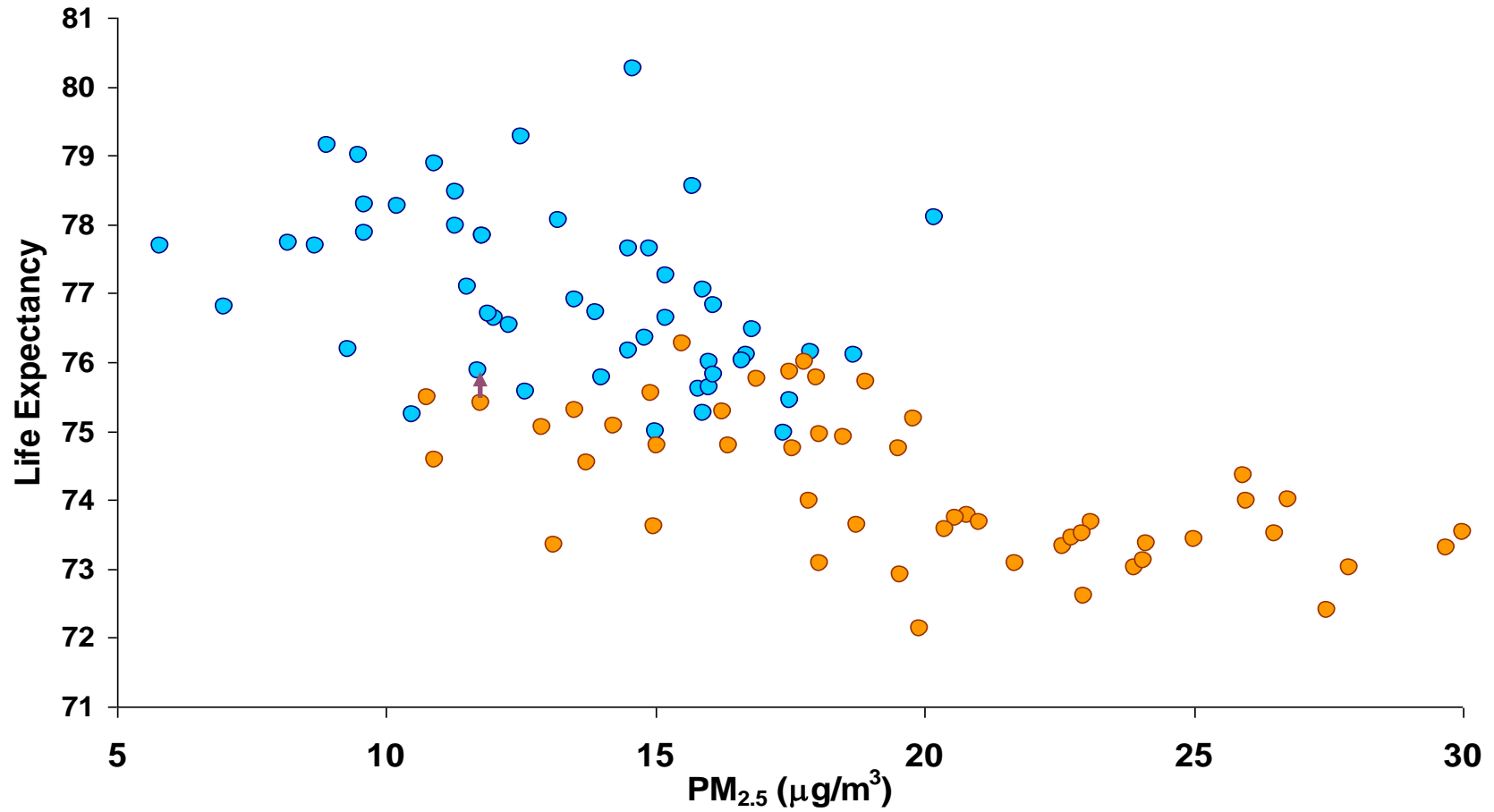
Pope, Ezzati, Dockery (NEJM 2009)

Life Expectancy vs PM_{2.5} 1997-2001



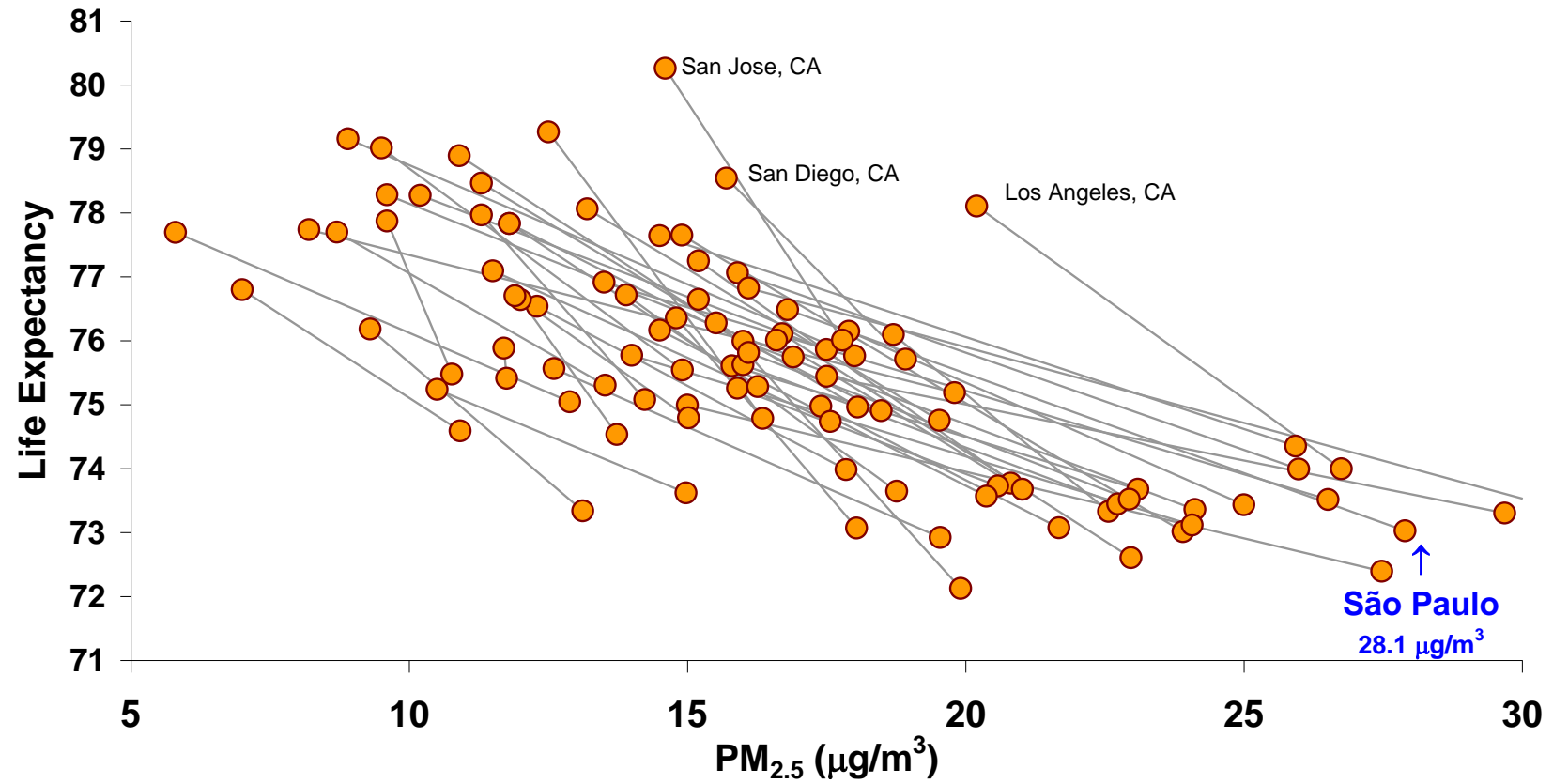
Pope, Ezzati, Dockery (NEJM 2009)

Life Expectancy vs PM_{2.5} 1980-2000

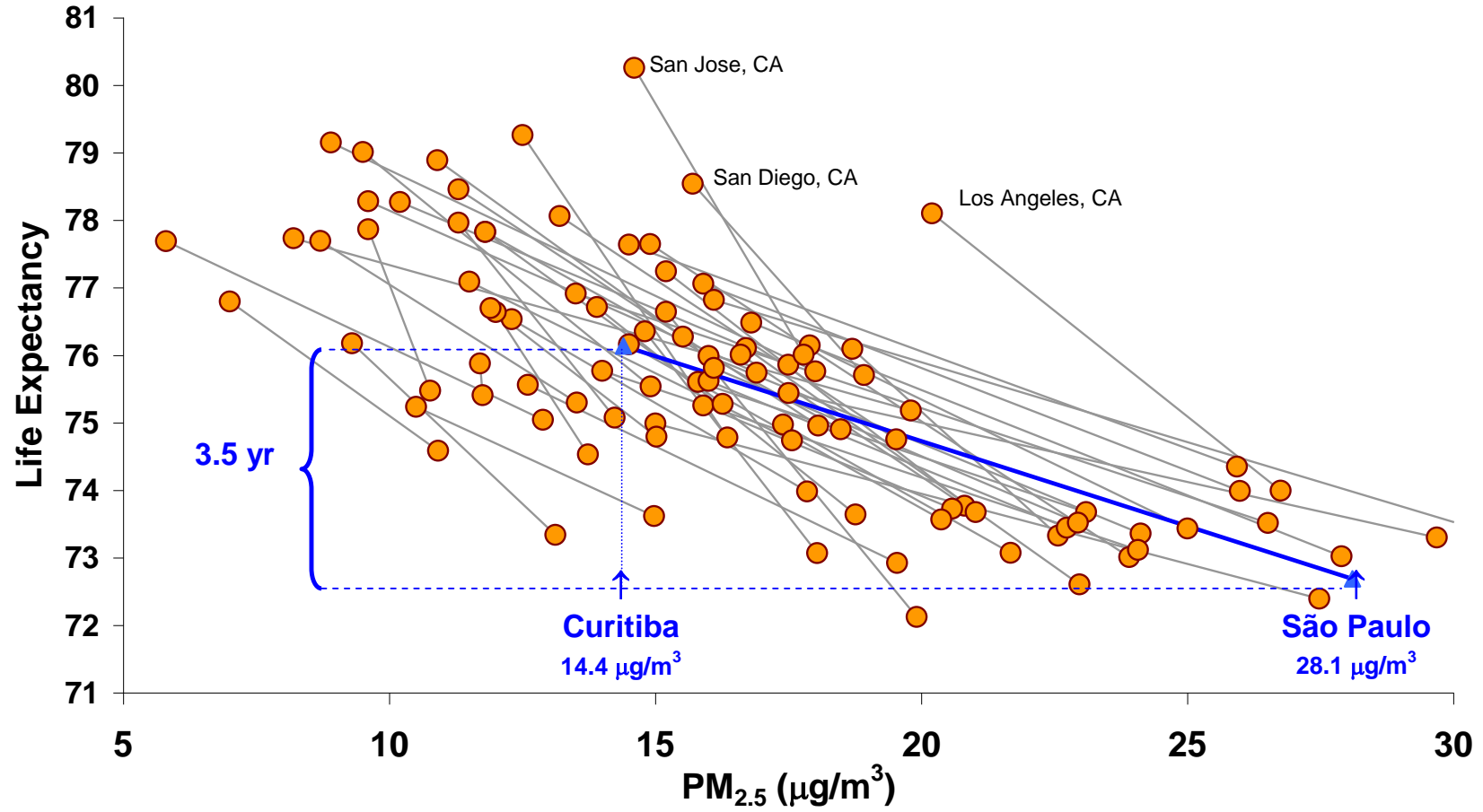


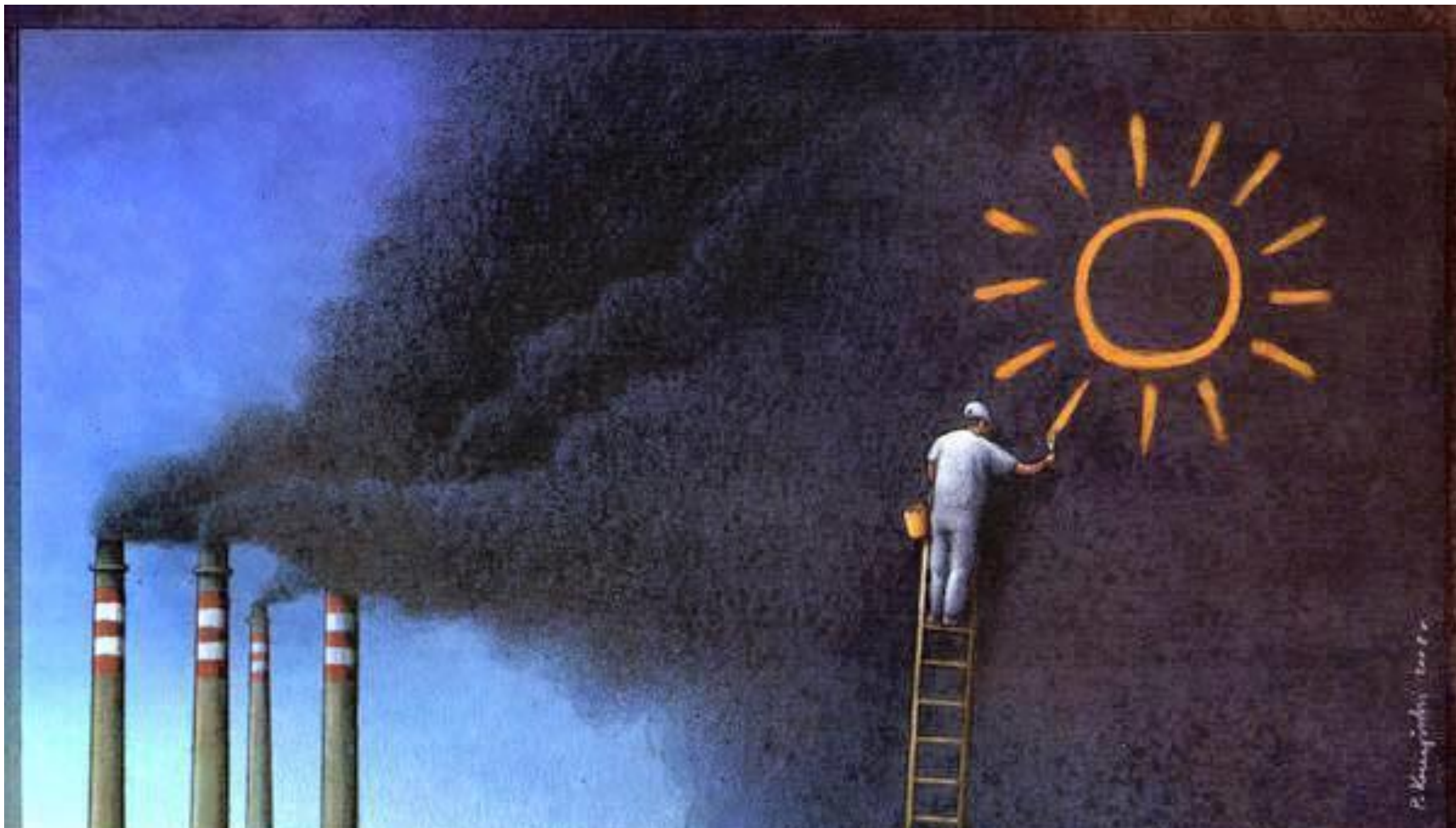
Pope, Ezzati, Dockery (NEJM 2009)

Life Expectancy vs PM_{2.5} 1980-2000



Life Expectancy vs PM_{2.5} 1980-2000





P. Keesing 1965