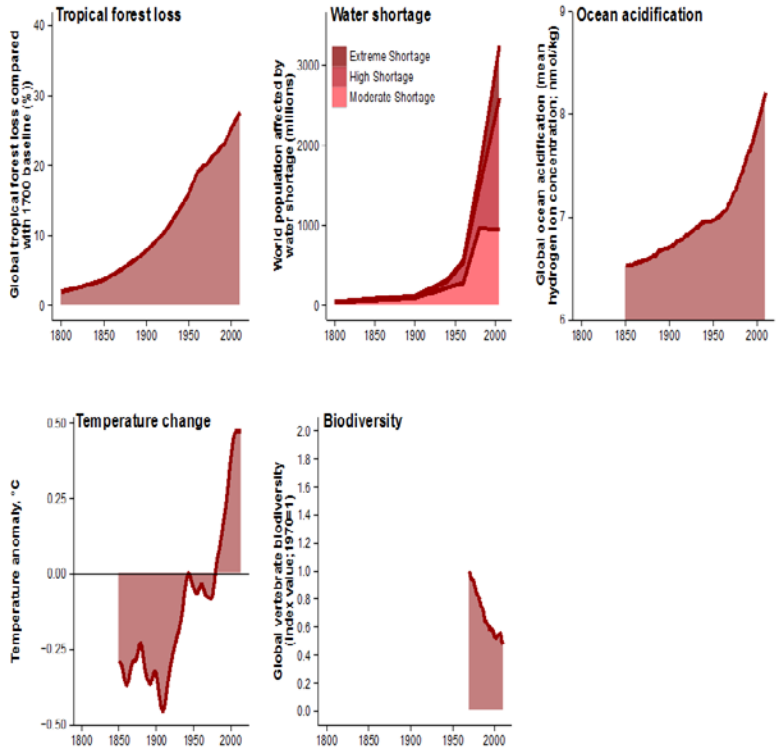


Reducing risks to health in the Anthropocene Epoch - Andy Haines



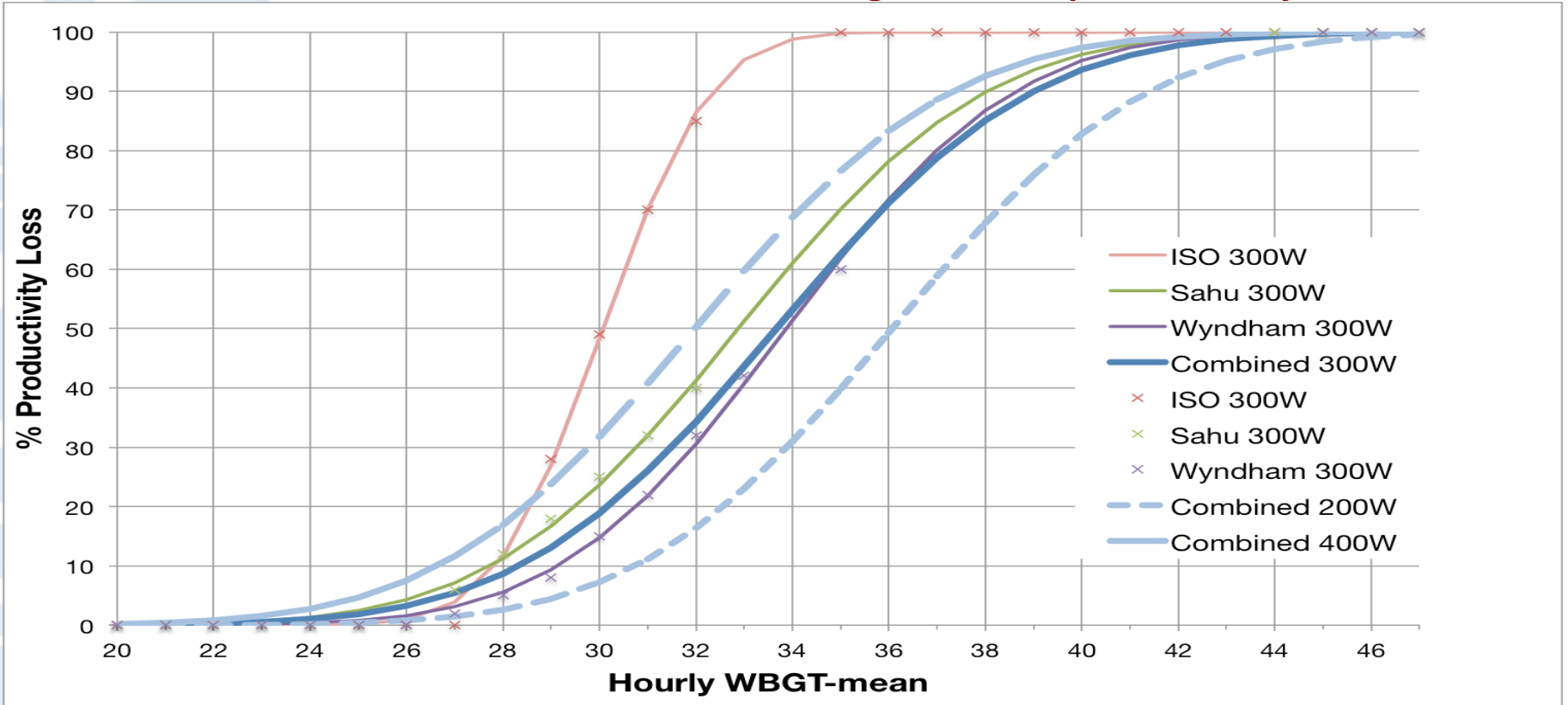
DIRECT EFFECTS ---HEAT AND EXTREME EVENTS

ECOSYSTEM MEDIATED EFFECTS e.g.
EMERGING INFECTIOUS DISEASES
VECTOR-BORNE DISEASES e.g malaria, dengue
WATER-BORNE DISEASES
FOOD SUPPLY and UNDERNUTRITION

SOCIALLY MEDIATED EFFECTS e.g. POVERTY,
MIGRATION AND CONFLICT

Exposure response curves for heat (WBGT) and productivity (Freyberg)

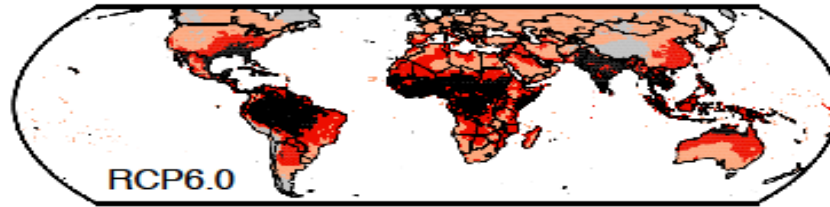
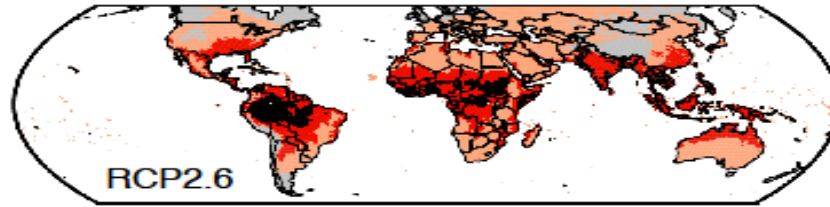
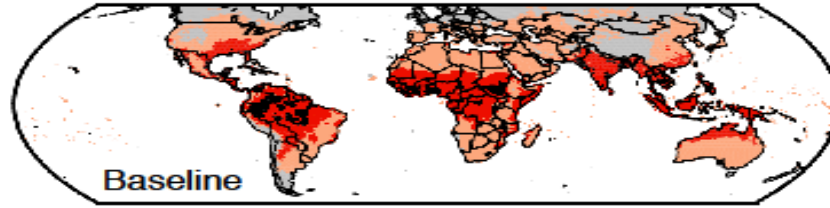
Small heat increases cause big losses in productivity



Extreme heat exposure under climate change

The ensemble mean of ISIMIP2b bias-corrected models are presented over a historical baseline (upper, 1979 – 2005), RCP2.6 (middle, 2090 – 2099) and RCP6.0 (lower, 2090 – 2099). Monthly maximum, Low risk (green) = WBGT < 24; Moderate risk (orange) = WBGT 25 – 31; High risk (red) = WBGT 32 – 35; Extreme risk = WBGT > 36. (Andrews et al in preparation 2017)

Heat exposure risk (WBGT, unitless)



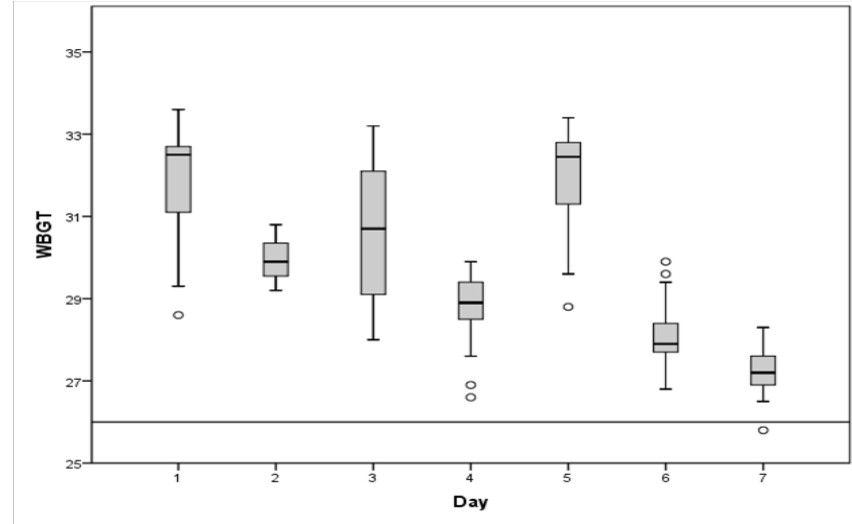
CKDu in Central America

- A dramatic increase of chronic kidney disease of unknown origin (CKDu)
 - Unexplained by conventional risk factors such as hypertension and diabetes
- Primarily affecting adult male agricultural workers, in particular sugarcane workers



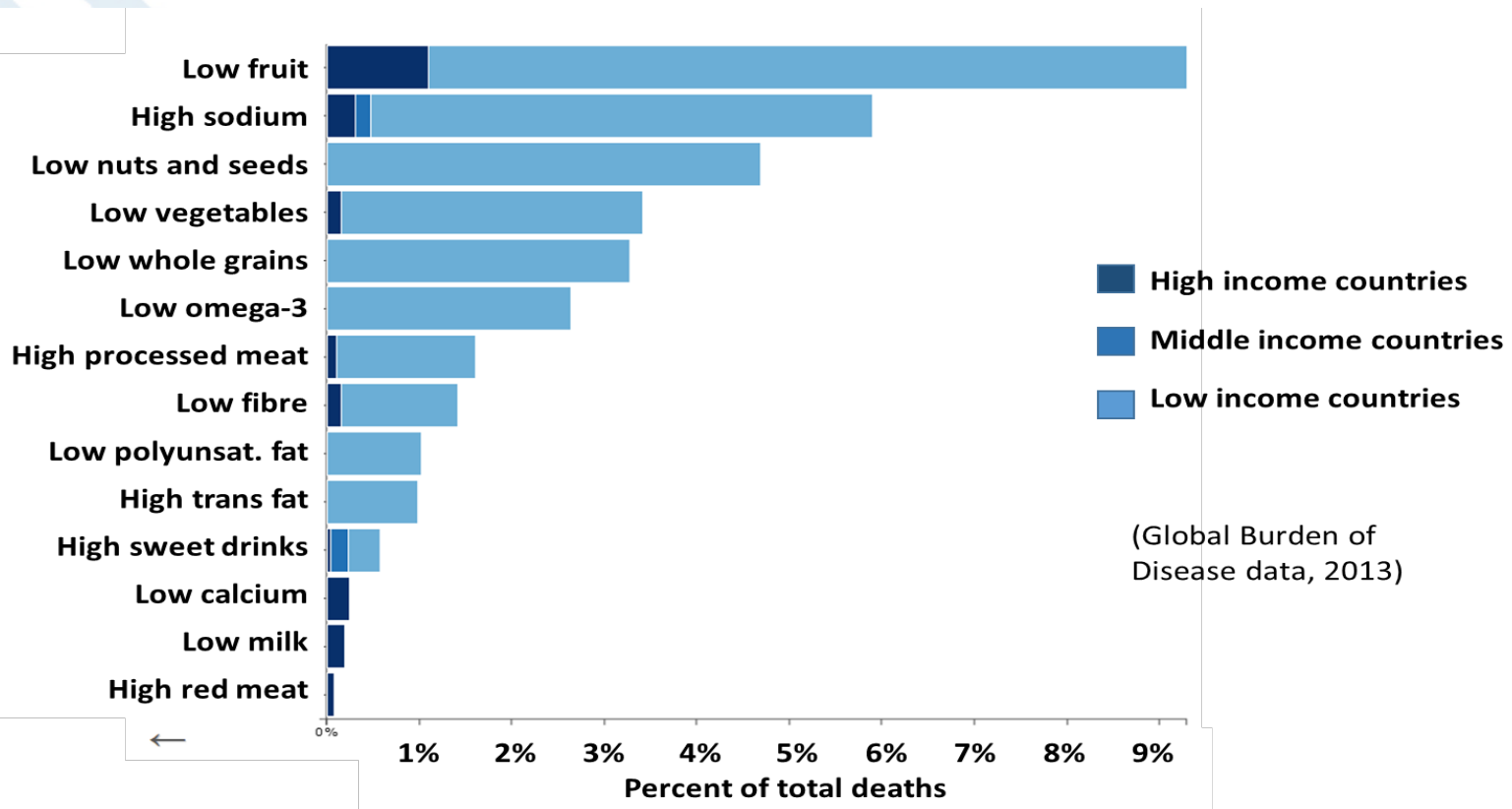
Along the Pacific coast, in the lowlands

Costa Rica, sugarcane cutters : WBGT measures



(Crowe et al. Am J Ind Med, 2013)

Importance of fruit and vegetables for health



(Global Burden of Disease data, 2013)



Systematic review of environmental effects on fruit yield

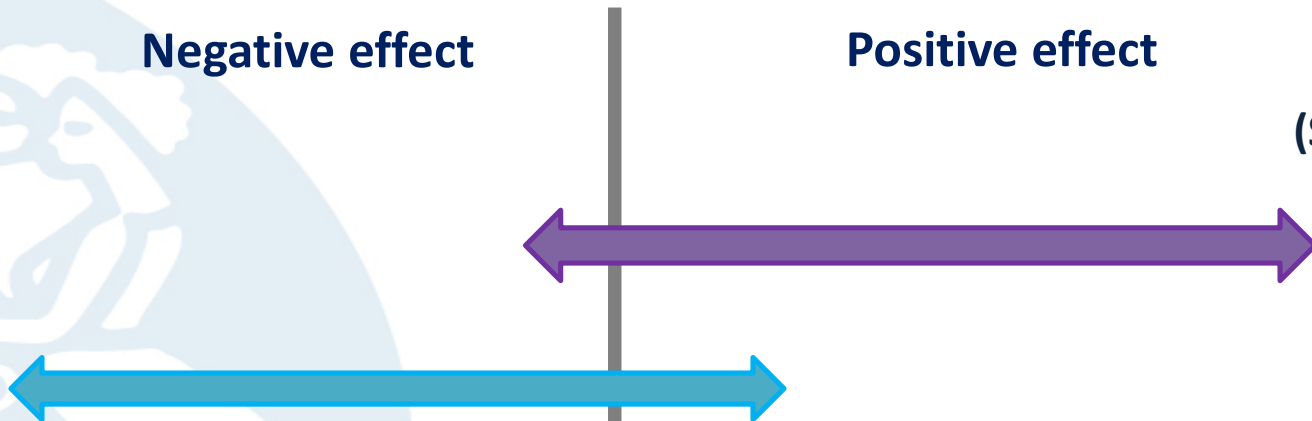


Fruits

(Scheelbeek et al 2017)

Negative effect

Positive effect



CO2
+250ppm



Water availability
-50%



Temperature
+4°C



Ozone
+25%

-100%

-50%

Yield Change

+50%

+100%

LONDON
SCHOOL of
HYGIENE
& TROPICAL
MEDICINE

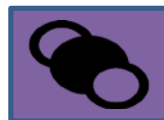
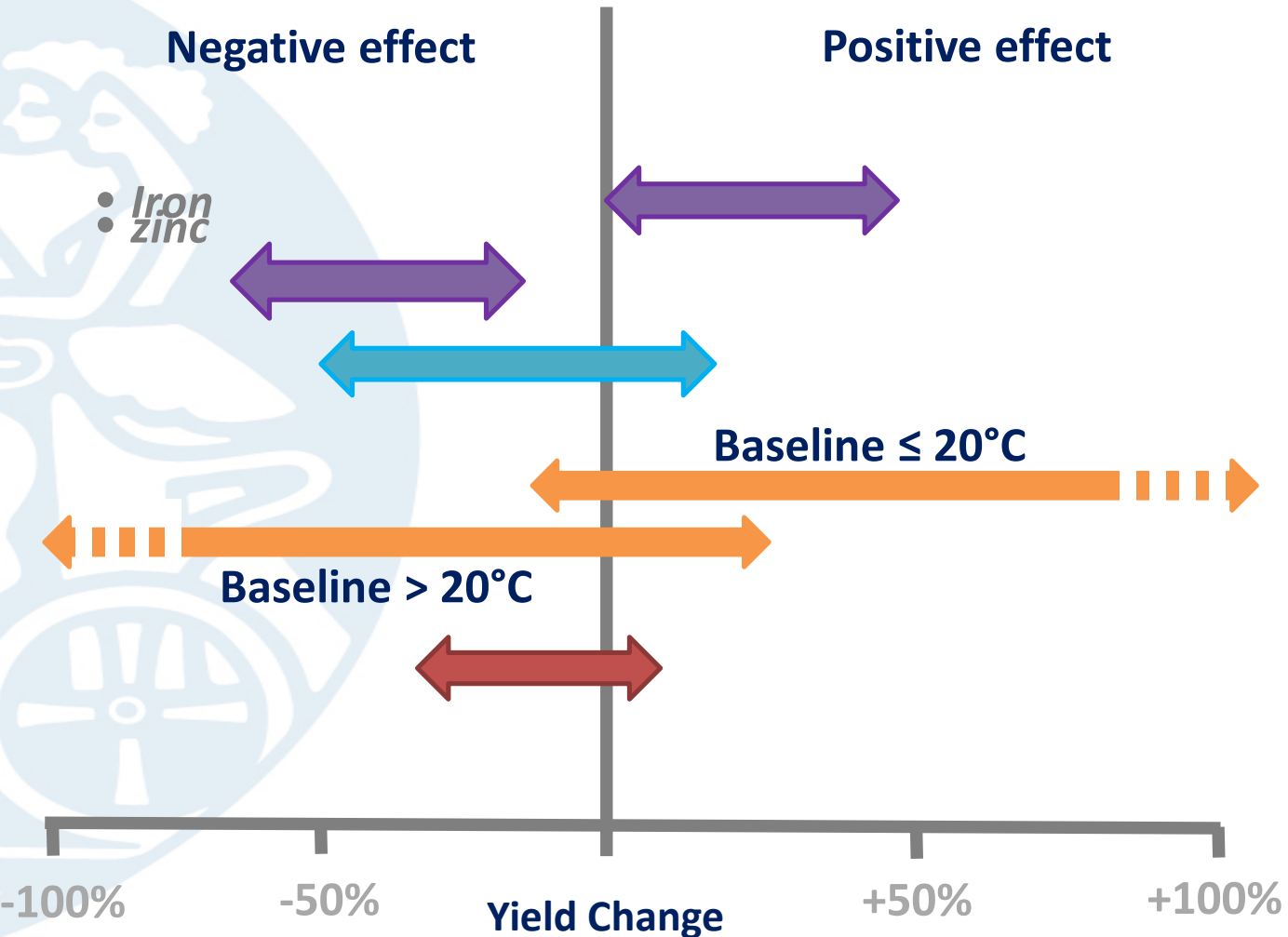


Systematic review of environmental impacts on vegetables



Leafy vegetables

(Scheelbeek et al 2017)



CO2 +250ppm



Water availability -50%



Temperature +4°C

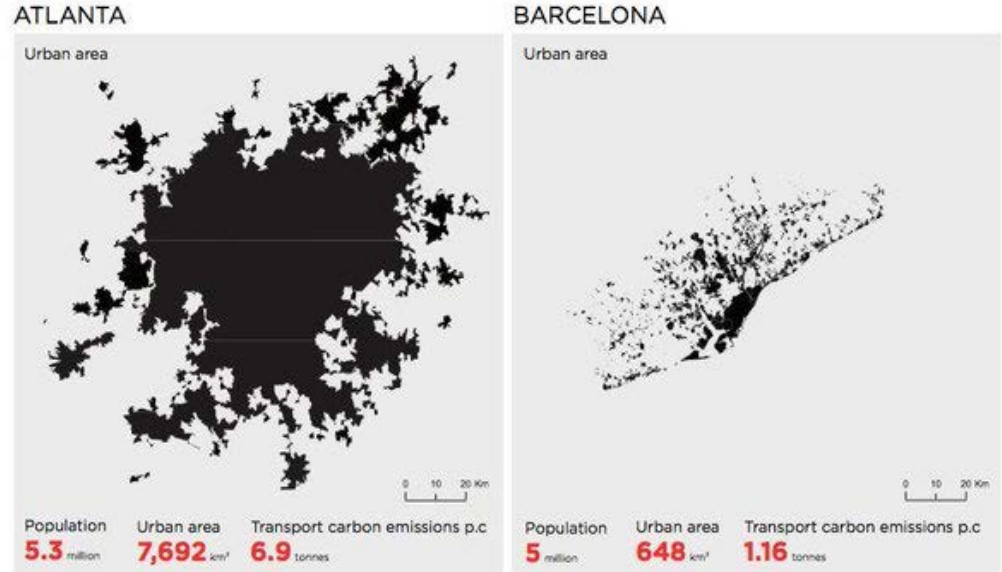


Ozone +25%

A healthy low carbon future will depend on cities

Cities are engines of economic growth and social change, with annual economic activity of about US\$62 trillion, 85% of global GDP in 2015 and 71–76% of global energy-related greenhouse gas (GHG) emissions.

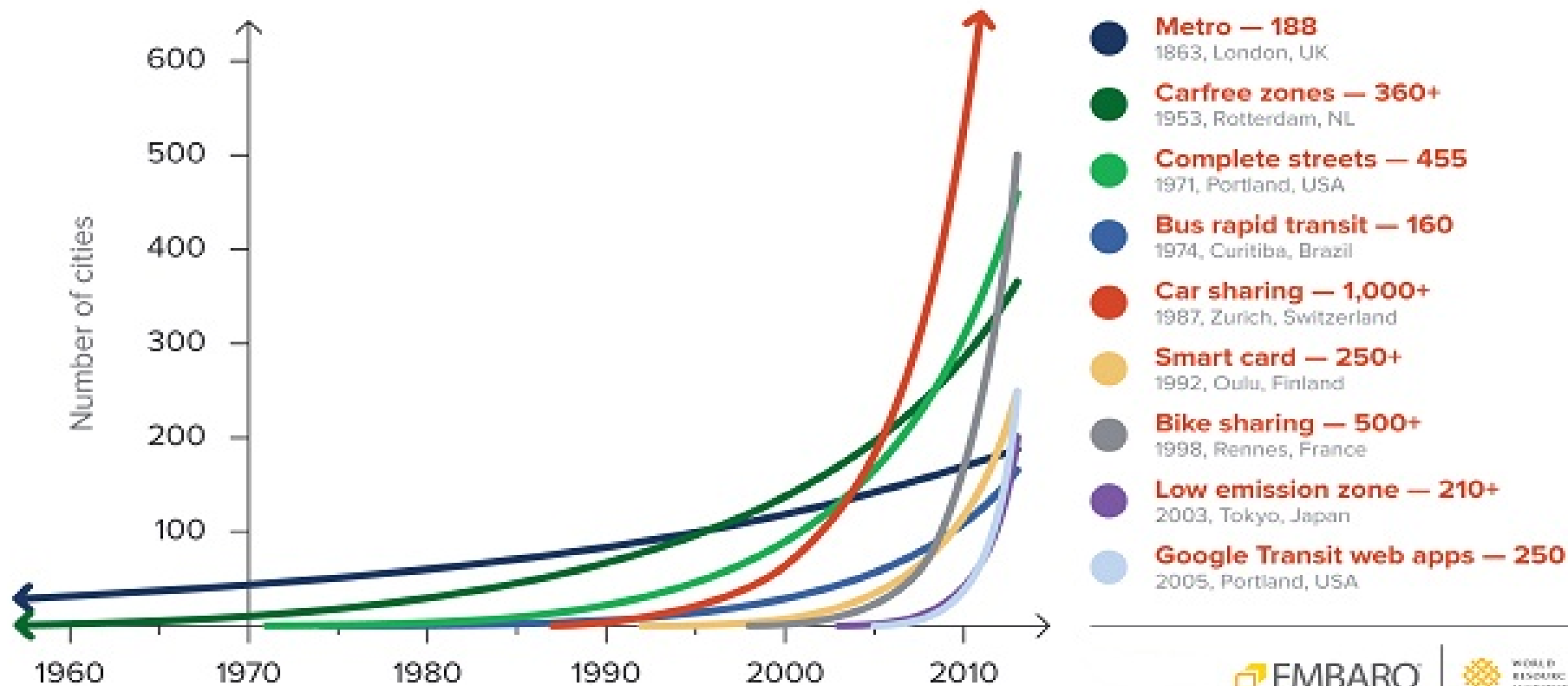
Newclimateeconomy.report/workingpaper_cities_final_web.pdf 2015



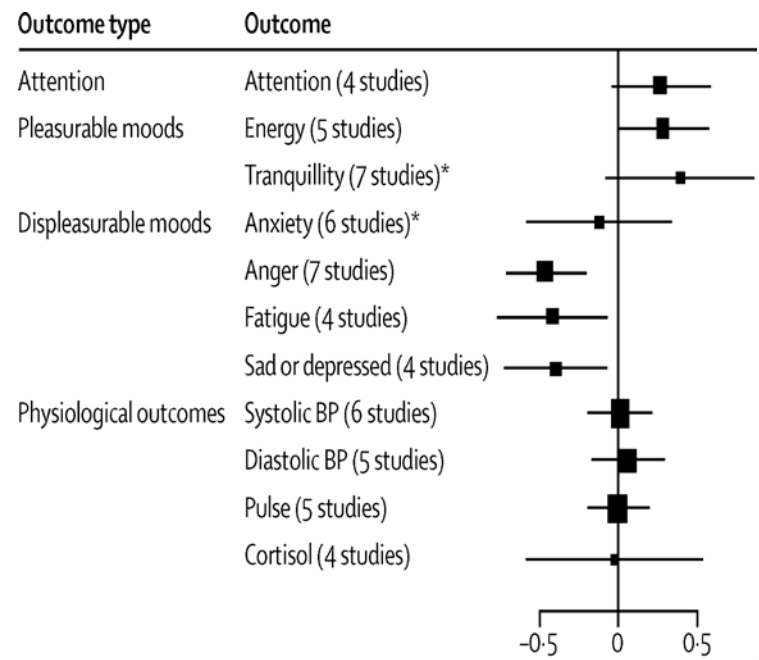
Source: LSE Cities 2014

More compact development can reduce transport emissions by an order of magnitude.

Sustainable mobility trends scale up



Psychological and emotional benefits from exposure to natural versus synthetic environments



Bowler and colleagues the Collaboration for Environmental Evidence
 The Lancet 2015 386, 1973-2028 DOI: (10.1016/S0140-6736(15)60901-1)

How Forest Conservation Reduces Disease risks –example from the Brazilian Amazon



- **Decreased Malaria transmission**
- **Reduced air pollution and fewer Acute Respiratory Infections (ARI)**
- **Cleaner water--- Less diarrhoeal disease**

Bauch, Birkenbach, Pattanayak and Sills PNAS 2014



Impacts of shifting from current (Western) diets to more environmentally sustainable dietary patterns:

Aleksandrowicz et al., PLoS ONE 2016



Environmental Impact

Estimated relative differences compared to current diets

	Healthy dietary guidelines	Vegetarian diets
Greenhouse gas emissions	12% reduction	31% reduction
Land use	20% reduction	51% reduction
Water Use	6% reduction	37% reduction

HEALTH IN THE SDG ERA



World Health Organization

[WWW.WHO.INT/SDGS](http://www.who.int/sdgs)

