



JAMES MARTIN 21ST CENTURY SCHOOL

Systems Analysis Applied to Environment and Health

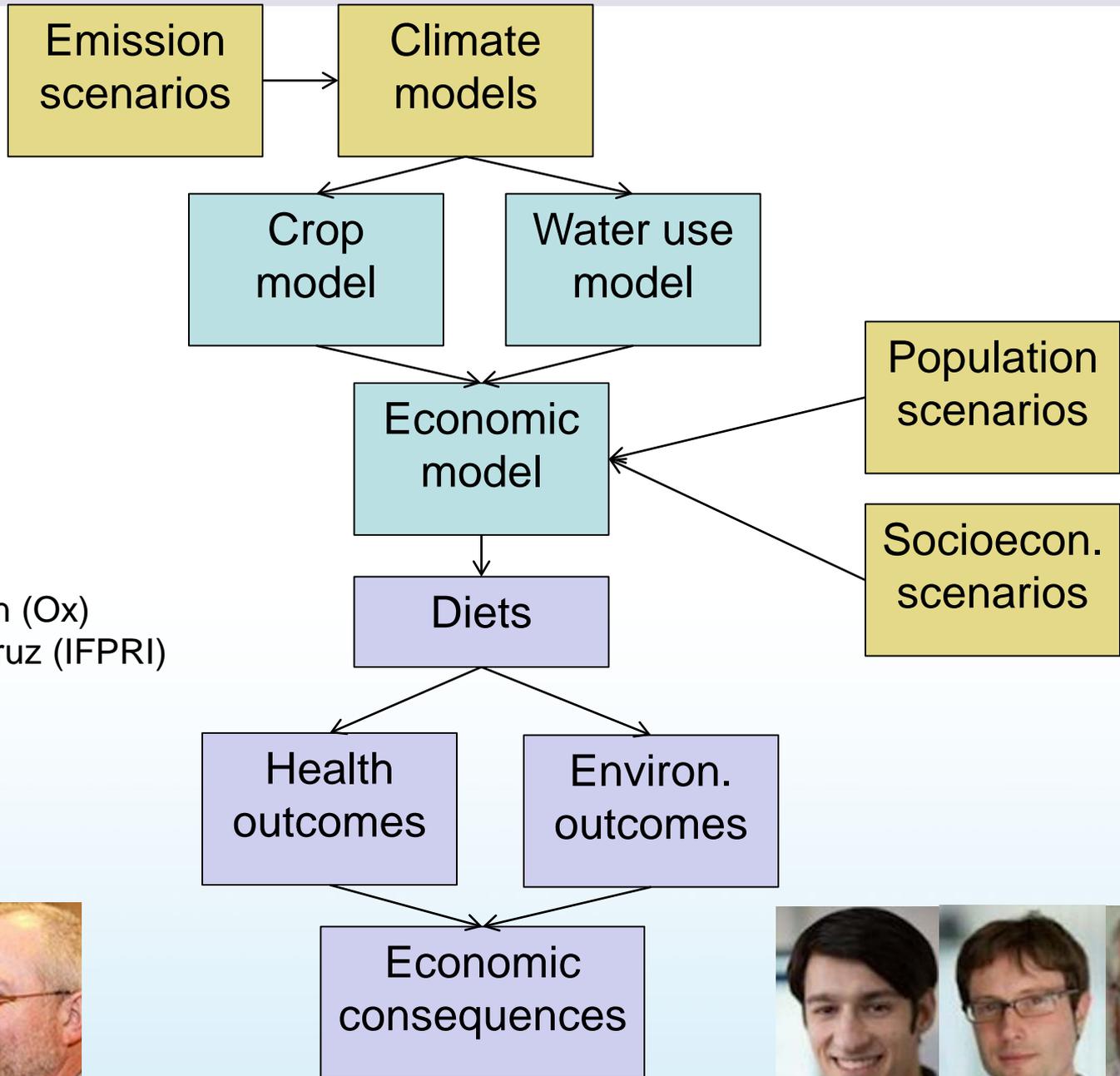
Health-Environment Co-benefits of Diet Change

Royal Society
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Oxford Martin Programme on the Future of Food
(one of the Oxford Networks for the Environment)
Oxford University





Modelling Strategy

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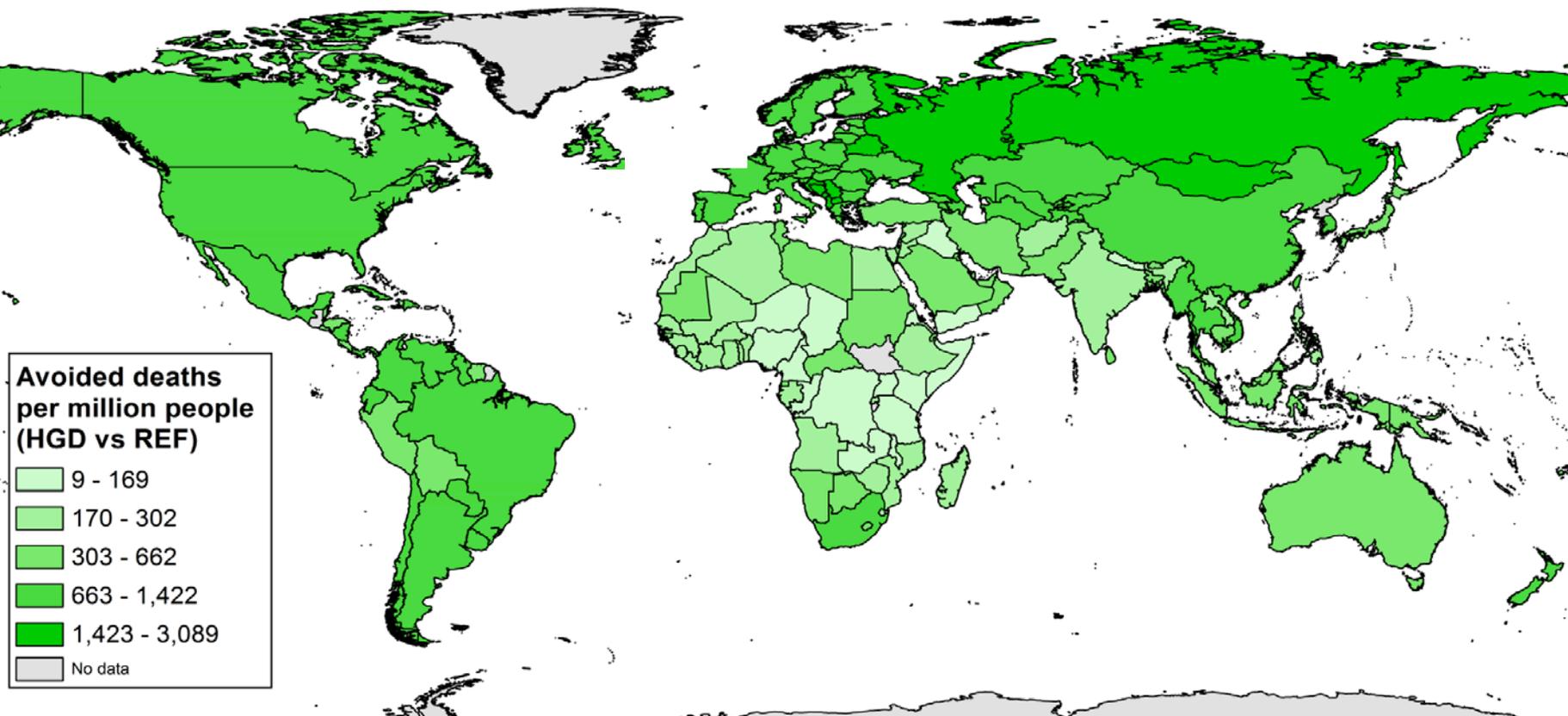
What if we eat healthily?

- Assume transition to WHO recommended (regional) diets in 2050
- Calculate diet-related deaths
- ... and GHG emissions
- ... and begin to explore economics

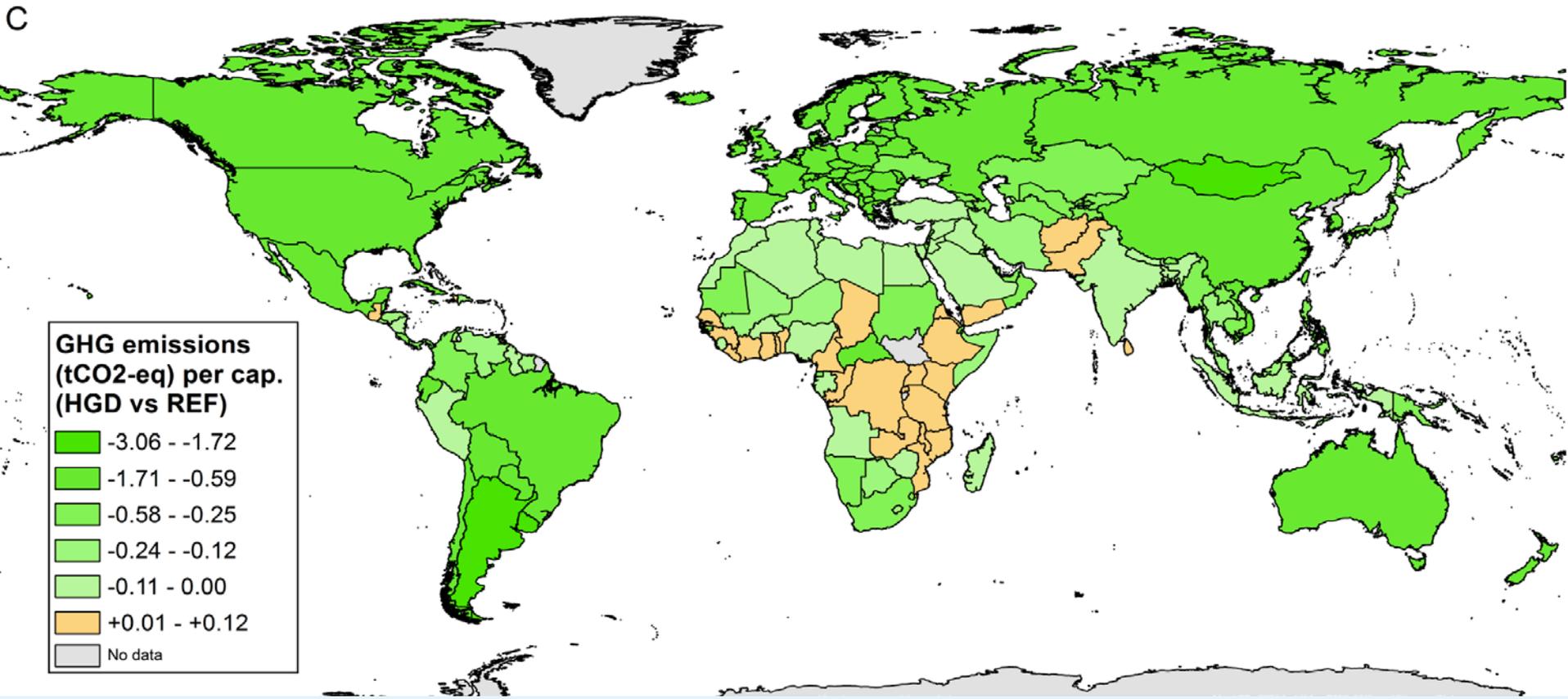
Compared to FAO diet predictions, adoption of a diet meeting nutritional guidelines would in 2050 result in 5.1M avoided deaths per year

Cartography: © Boris Johnson

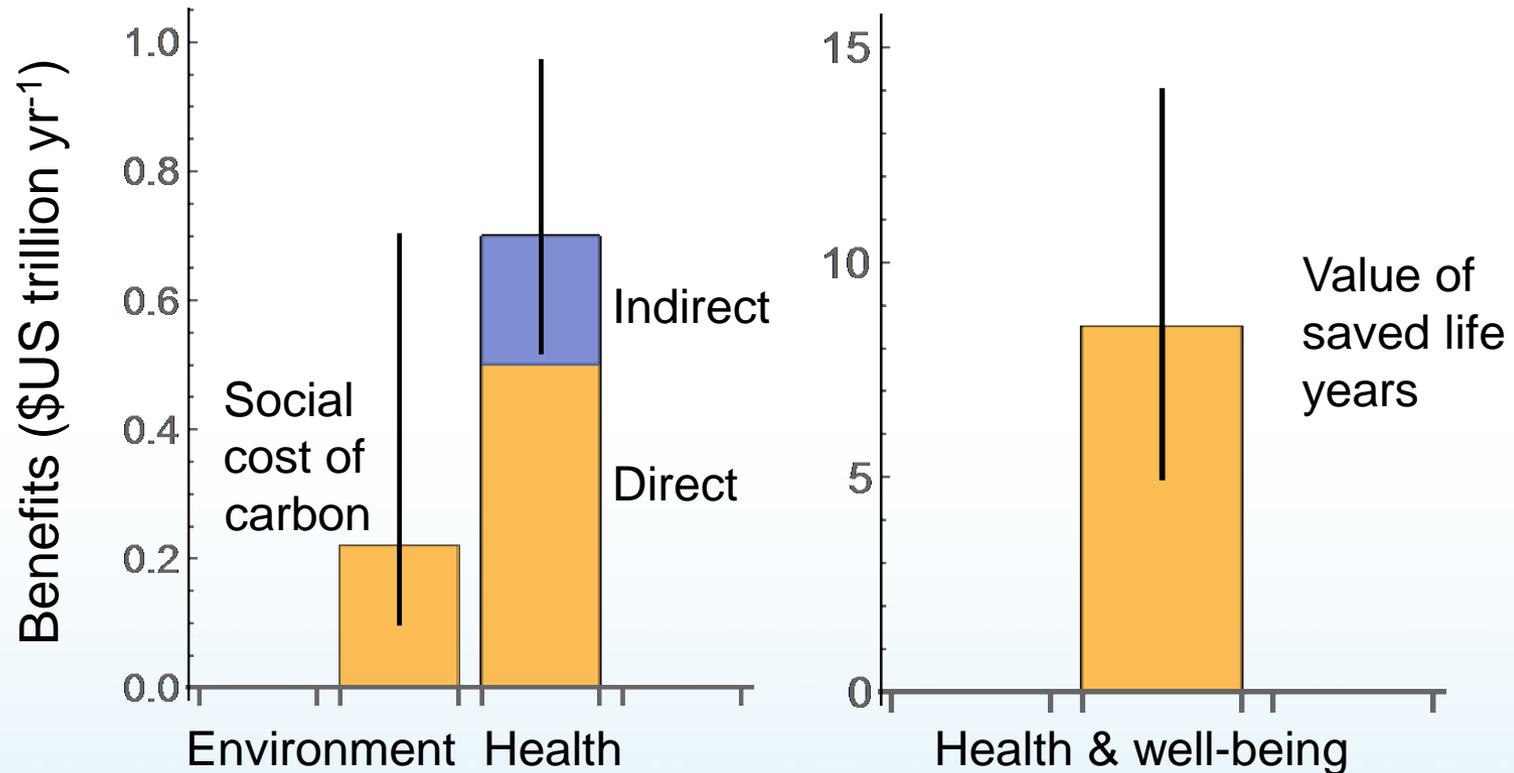
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Adoption of a diet meeting nutritional guidelines would in 2050
would reduce the increase food-system associated GHG emissions
from 51% to 7%



There are substantial economic benefits of switching to better diets

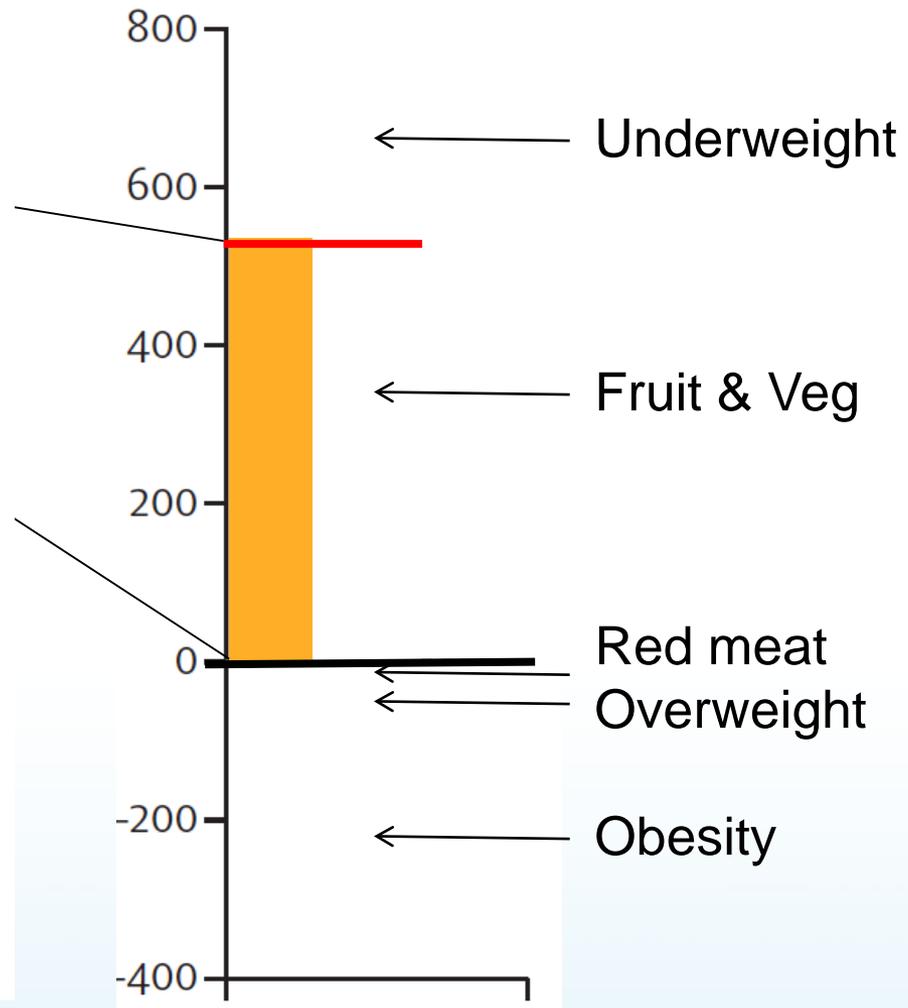
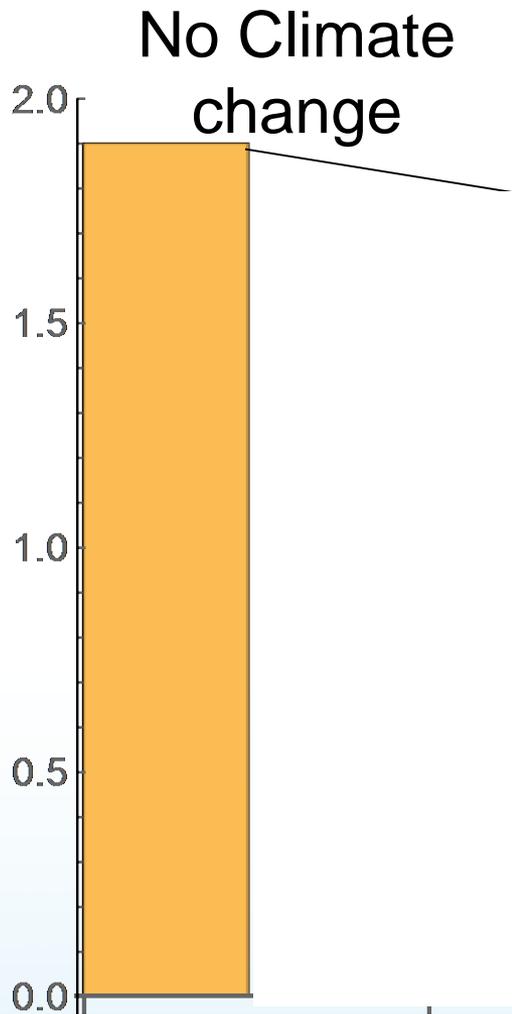


GWP (Σ GDP) \approx \$US 80T yr⁻¹

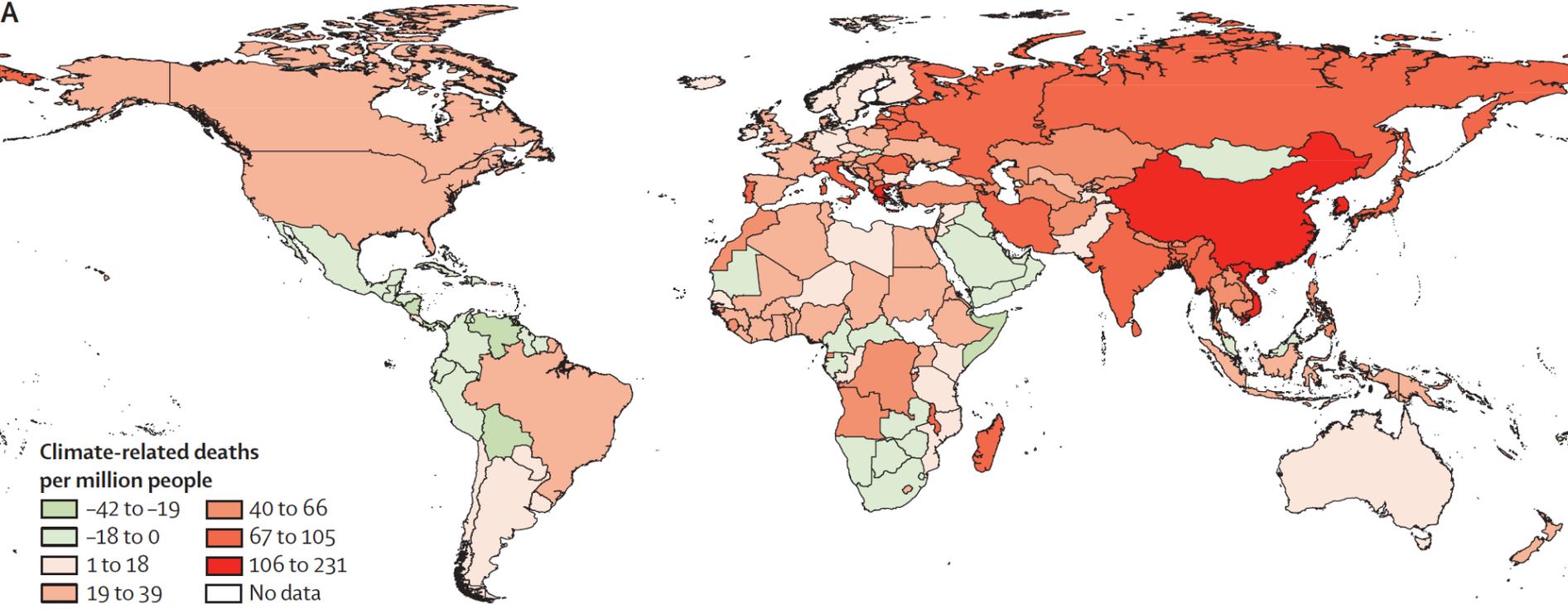
How will climate change affect diet-related mortality by 2050?

- Drive economic/health model by “high” (2°C) emissions pathway and mid population/economic growth
- Derive diets from economic models (supply, demand, prices & trade)
- Derive health from diet (meat, fruit and veg) and weight (under-, normal, over-, obese)
- WHO study estimates extra 85,000 death

Avoided deaths per year
(millions)

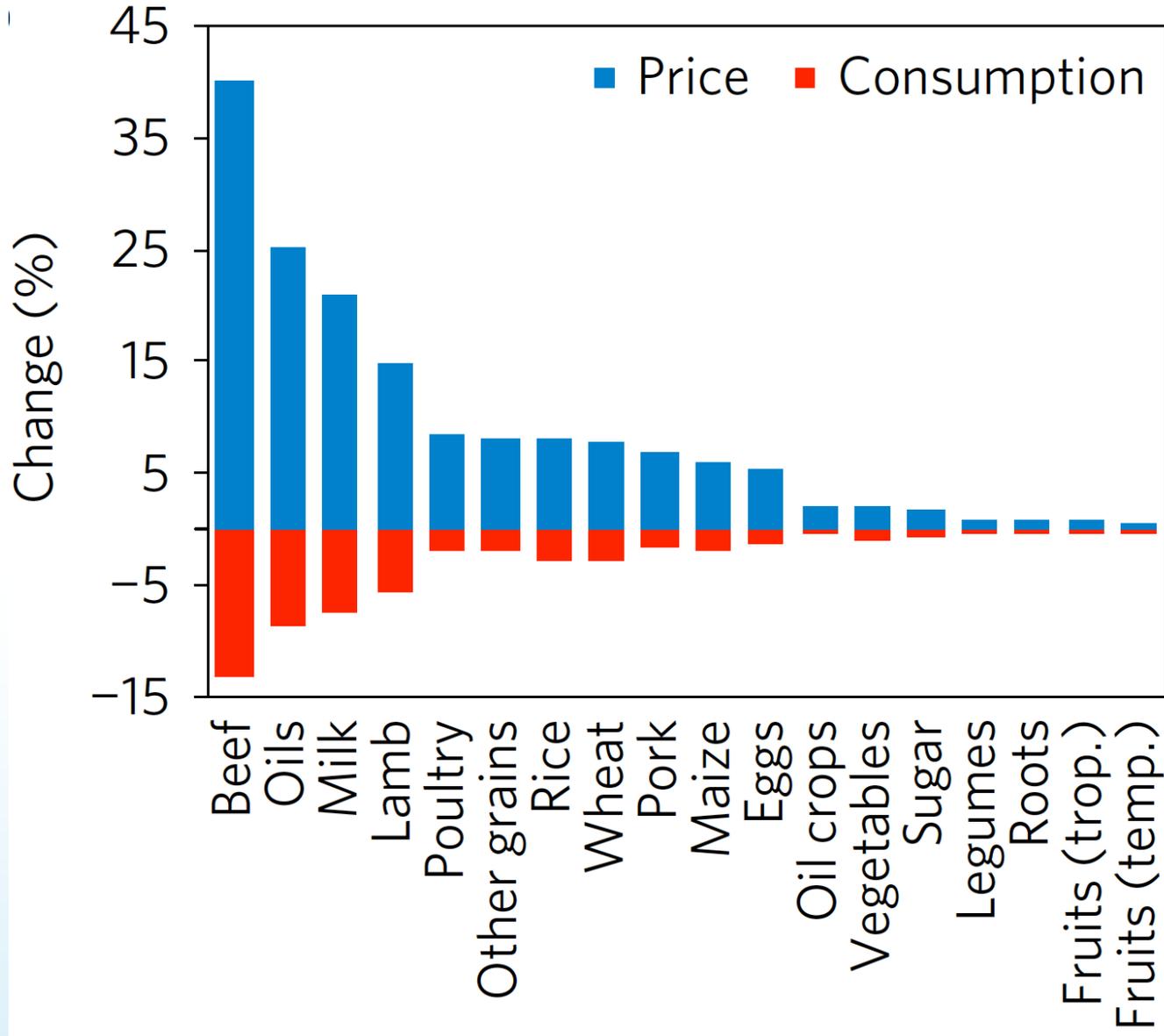


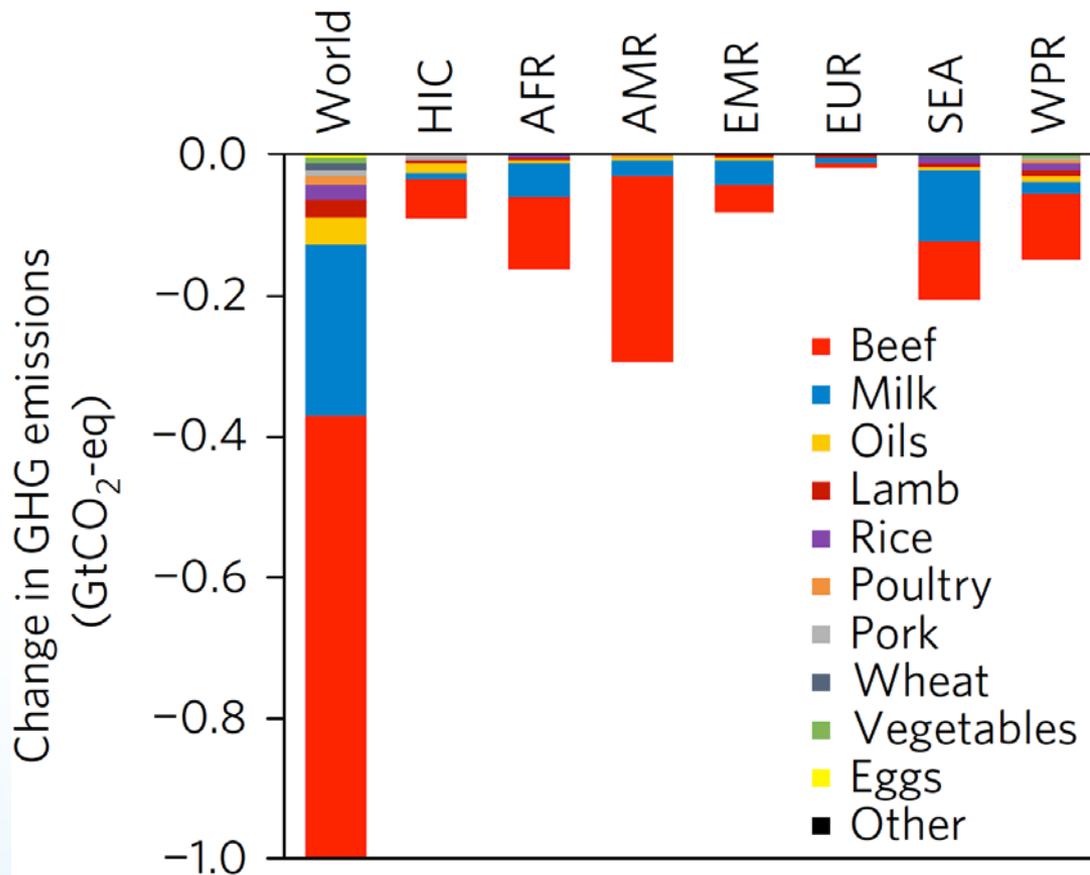
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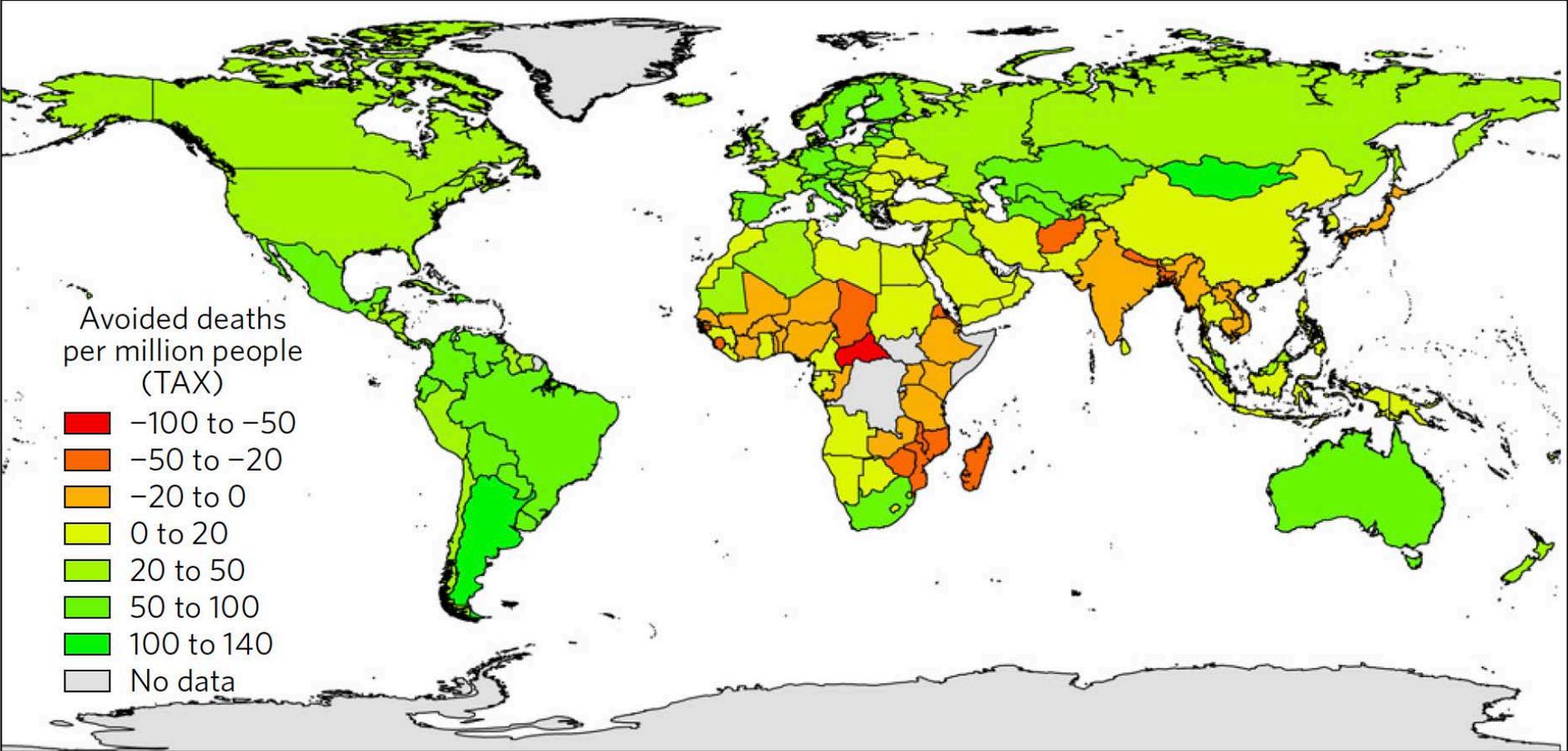
What if we taxed climate unfriendly food?

- Use life cycle analysis to assess GHG emissions
- Introduce a proportionate tax, look for perverse effects
- Redesign tax intervention
- (Recognise a rather simplistic first step)

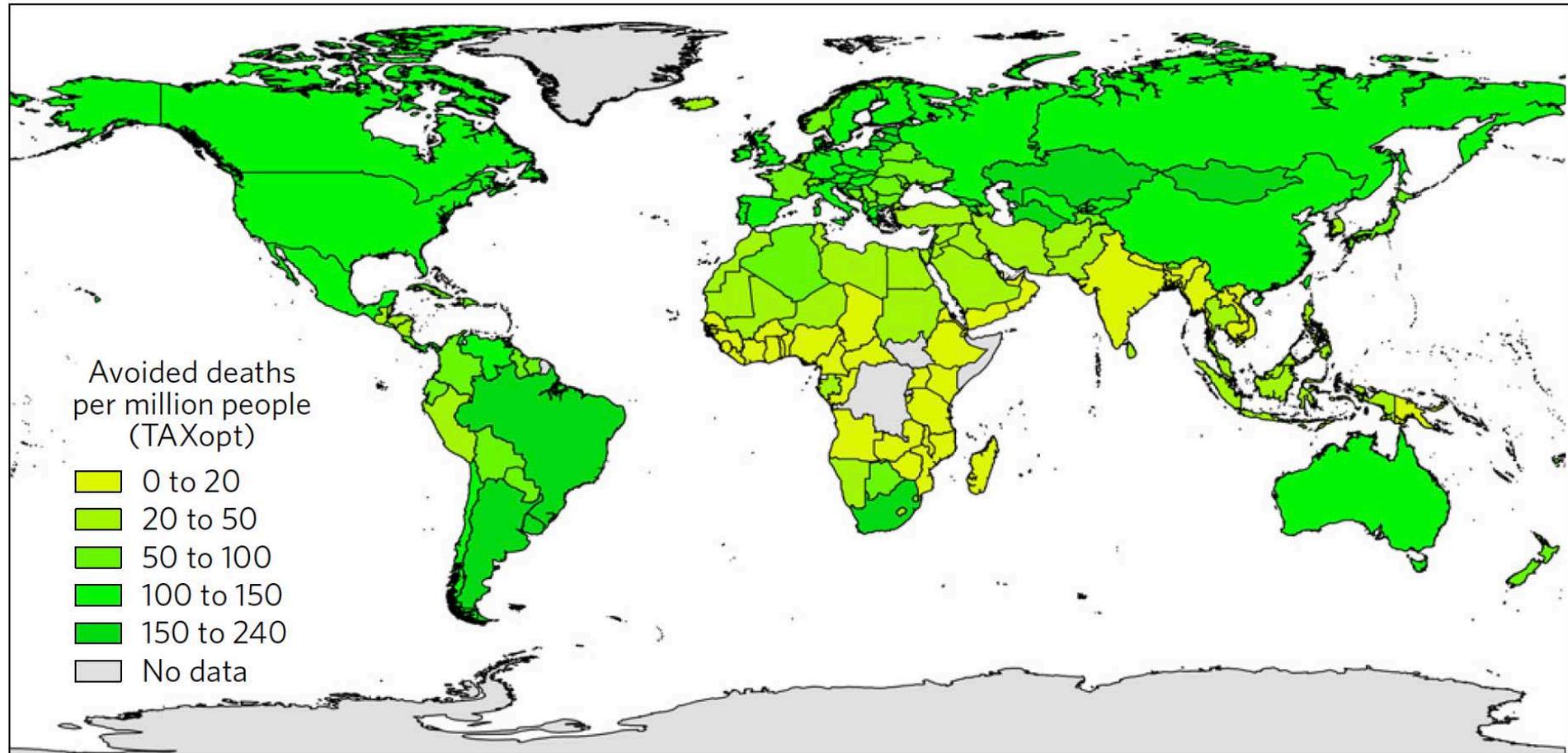




~10% of reduction required for $\Delta T < 2^\circ$



Net ~100K avoided deaths and 1 Gt CO₂ emission reduction yr⁻¹



Net ~500K avoided deaths and 0.9 Gt CO₂ emission reduction yr⁻¹

Conclusions

- Very many modelling caveats
- We are extending to other environmental dimensions
- Substantial health/environment/economic co-benefits/co-risks
- Synergies good place to look for solutions
- We fail on food we fail on everything

FUTURE OF

Food

*The Oxford Martin Programme
on the Future of Food*

