



# What will climate change really cost us?

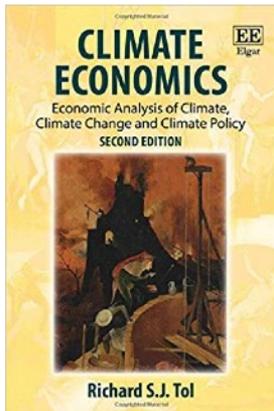
Richard S.J. Tol  
*University of Sussex*

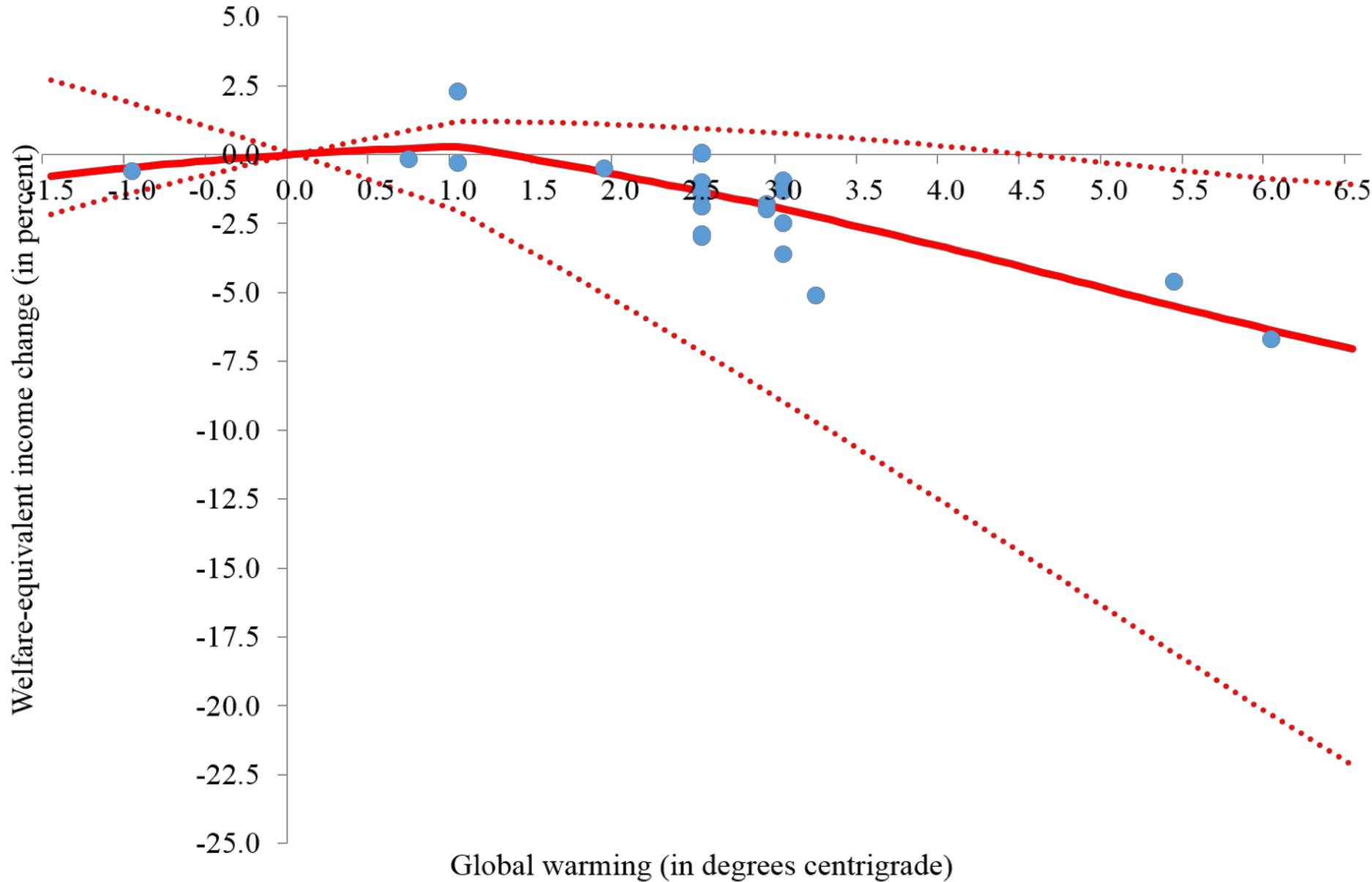
*Vrije Universiteit, Amsterdam*

*Tinbergen Institute*

*CESifo*

*Payne Institute*





“I don’t want your hope. I don’t want you to be hopeful. I want you to panic ... and act as if the house was on fire. ”

Greta Thunberg  
Environmental Activist



-22.5

-25.0

Global warming (in degrees centigrade)

“I do  
hope  
to be  
you  
as if  
fire.”

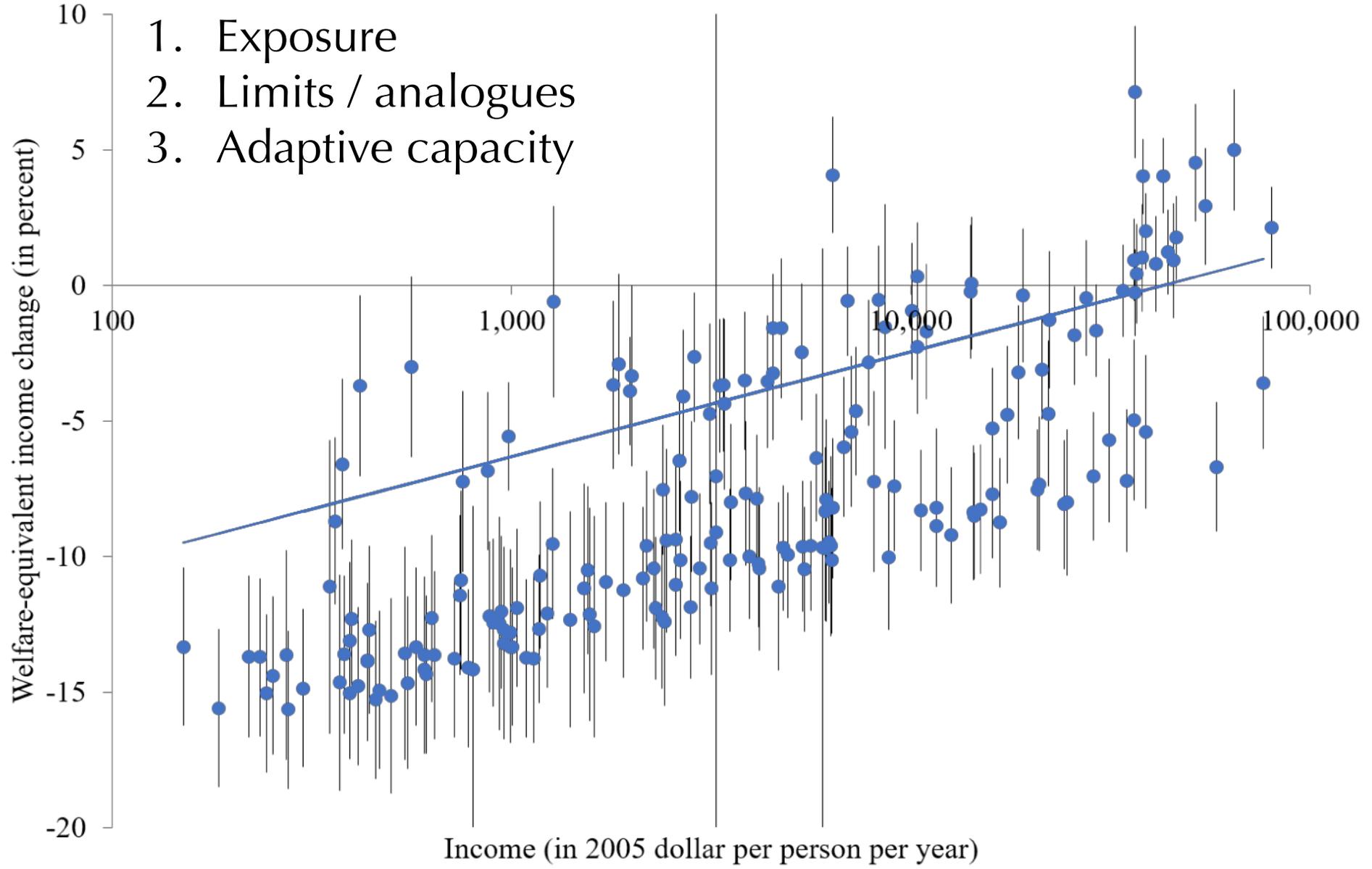
Greta T  
Environ

"Millennials, and Gen z, and all these folks that come after us, are looking up and we're like 'the world will end in 12 years if we don't address climate change, and your biggest issue is how are we gonna pay for it?'" @AOC #MLKNow #MLK2019  
[pic.twitter.com/fbUxr2C0tJ](https://pic.twitter.com/fbUxr2C0tJ)

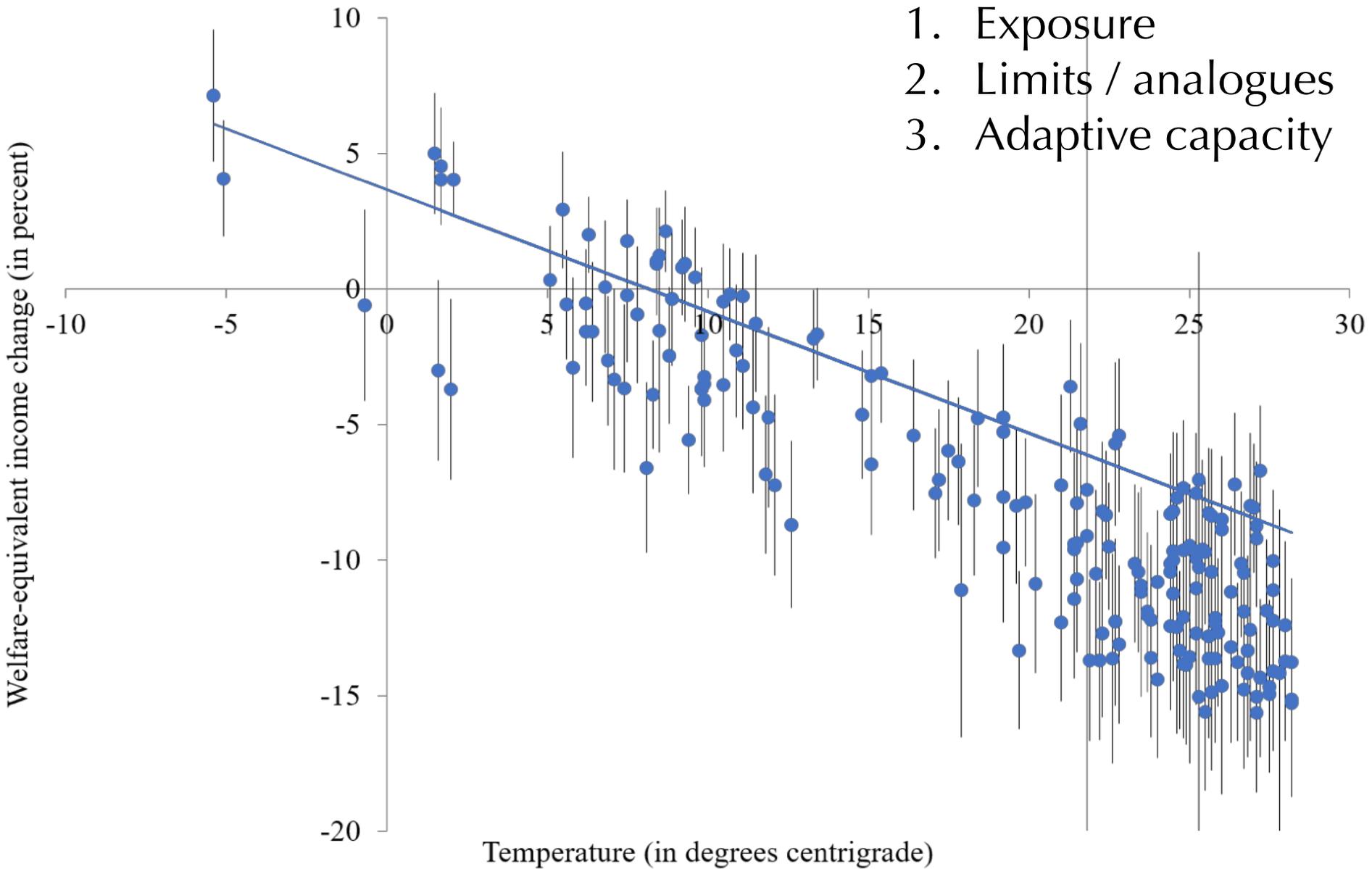
♡ 857 8:16 PM - Jan 21, 2019



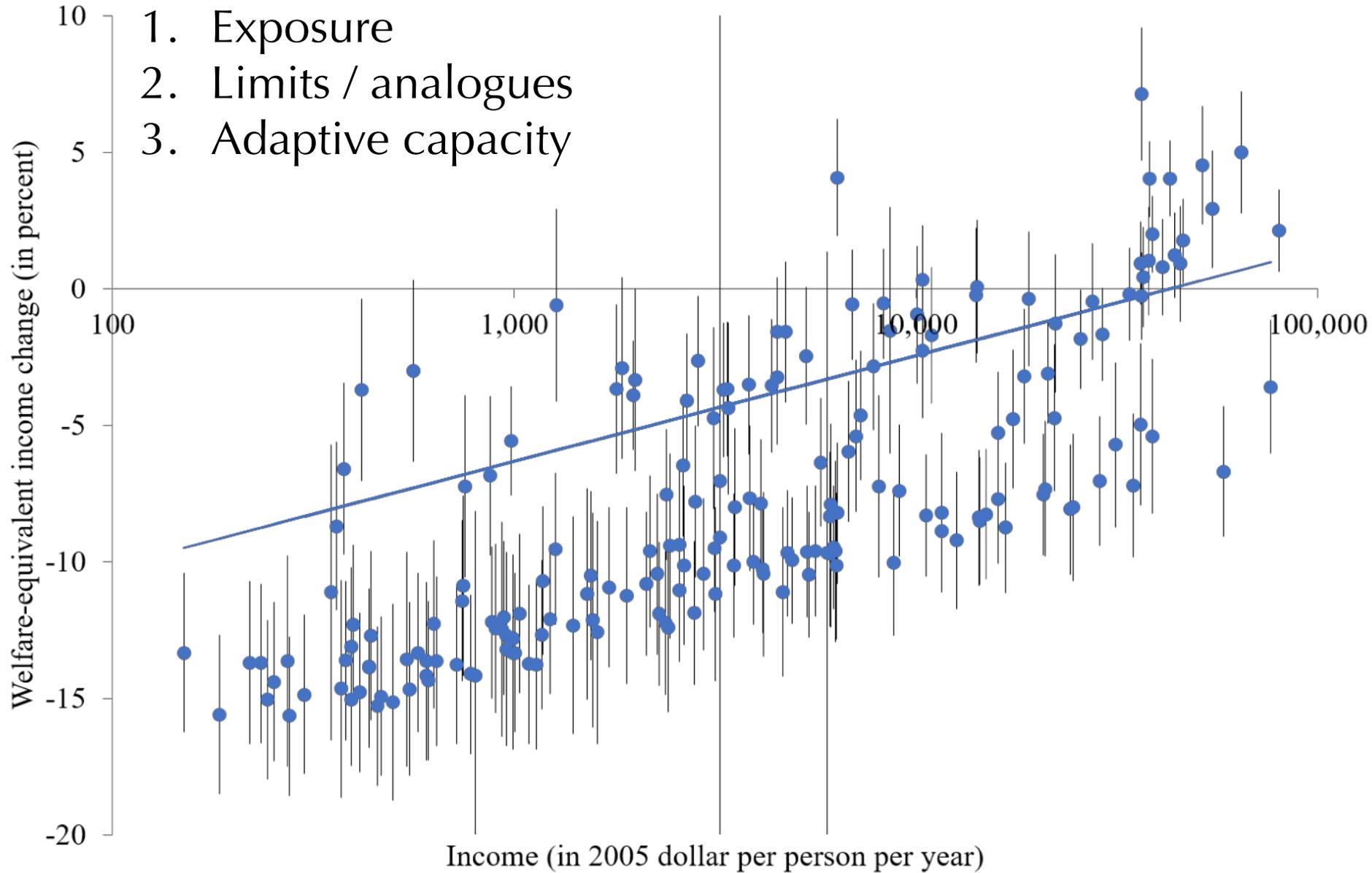
1. Exposure
2. Limits / analogues
3. Adaptive capacity



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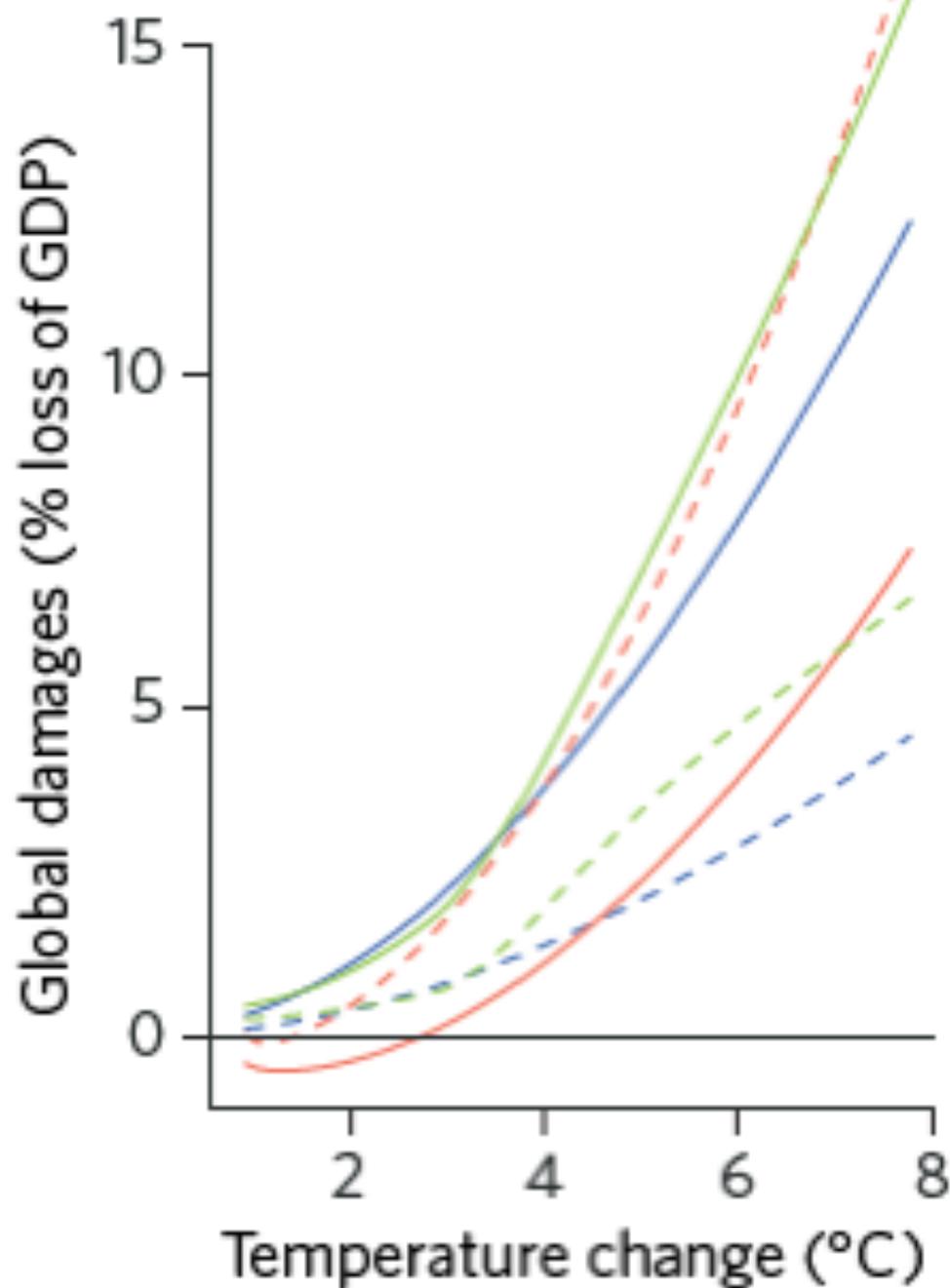


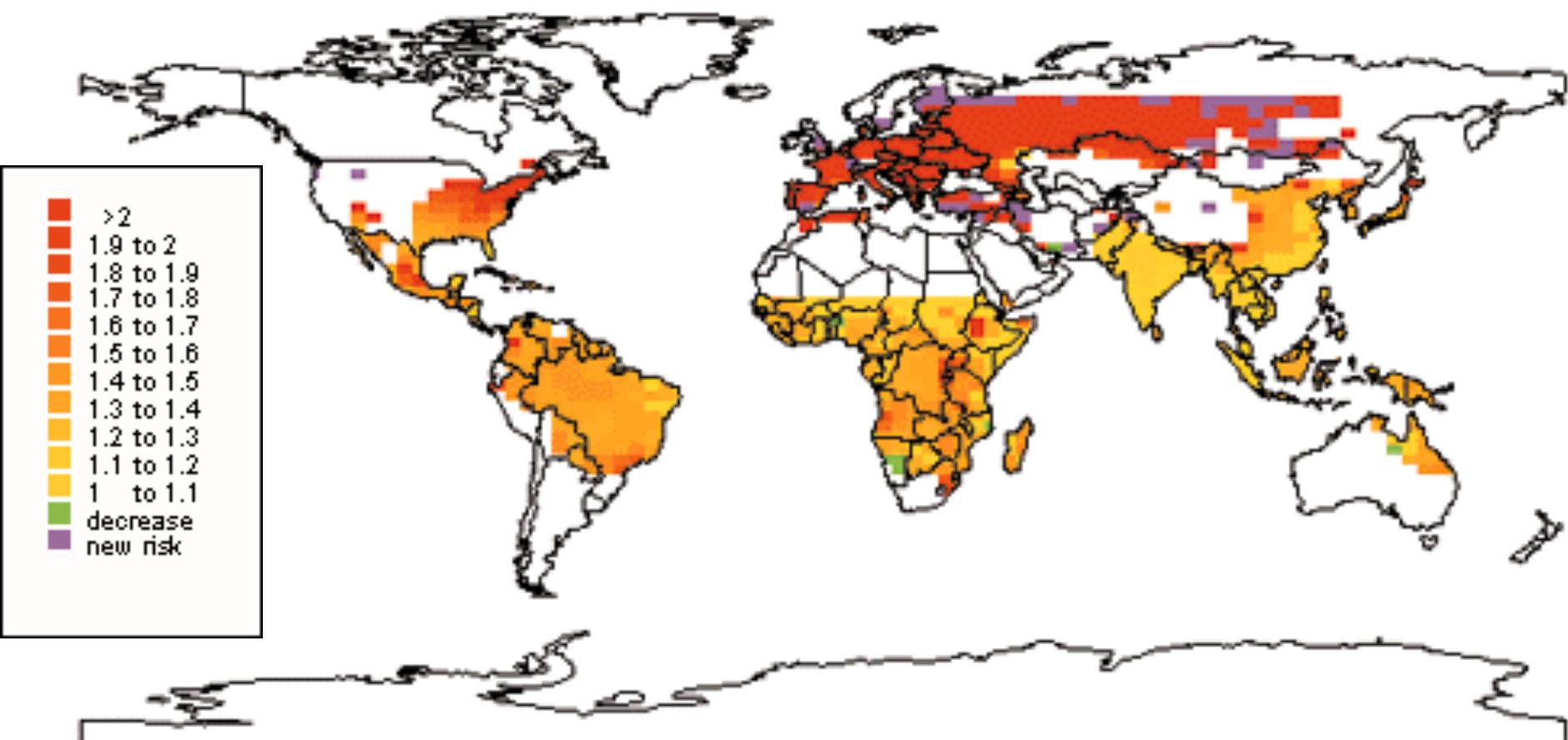
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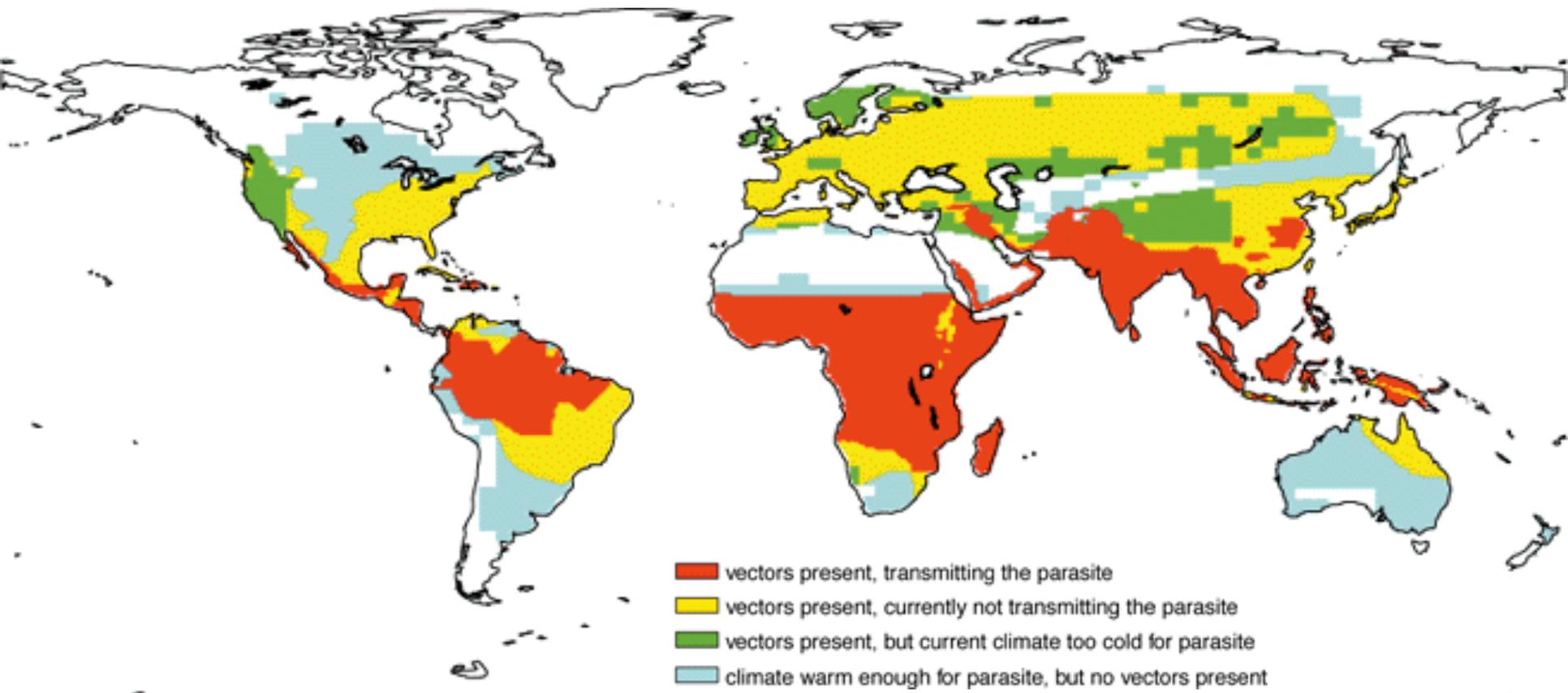


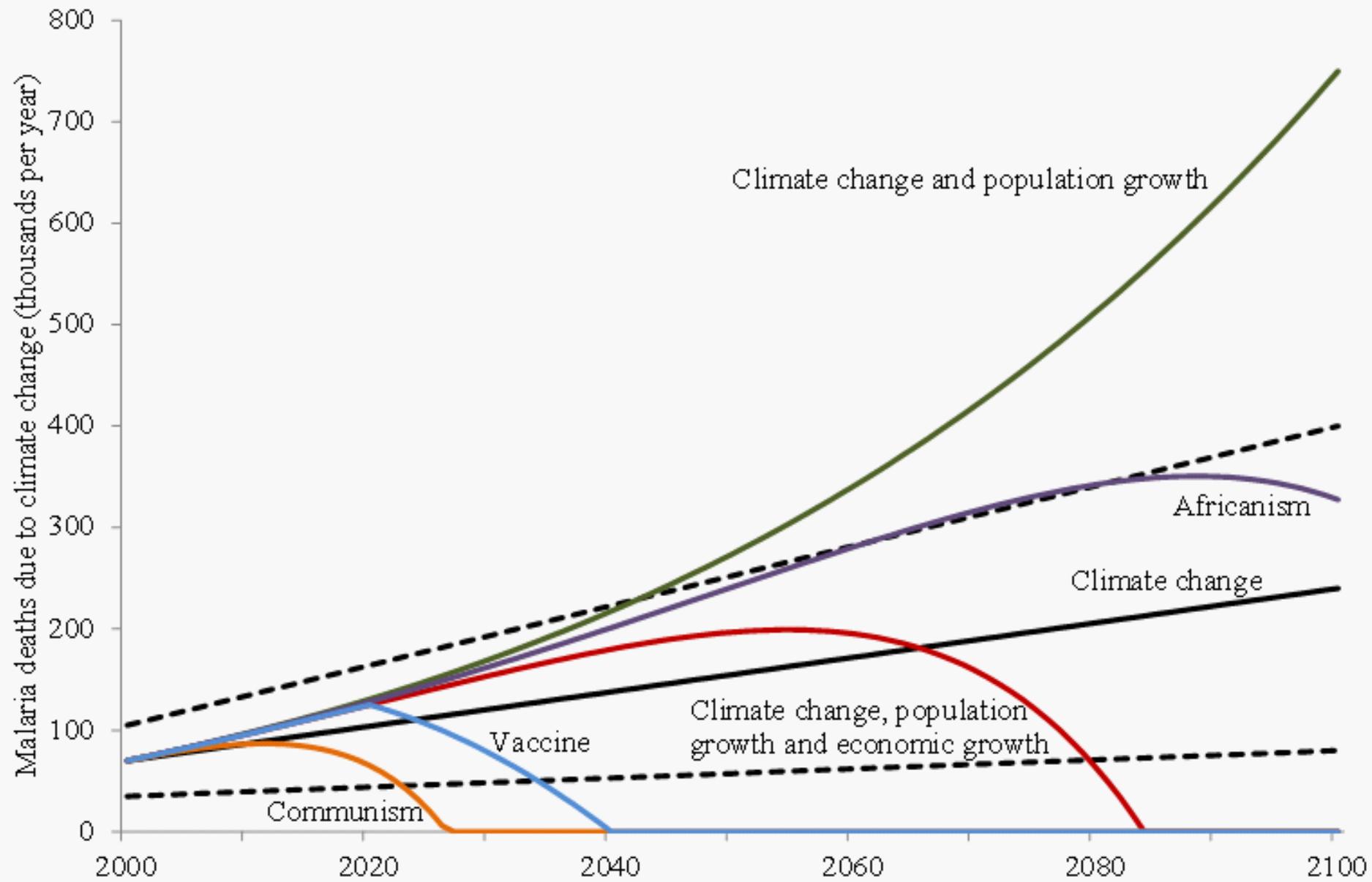
## Model

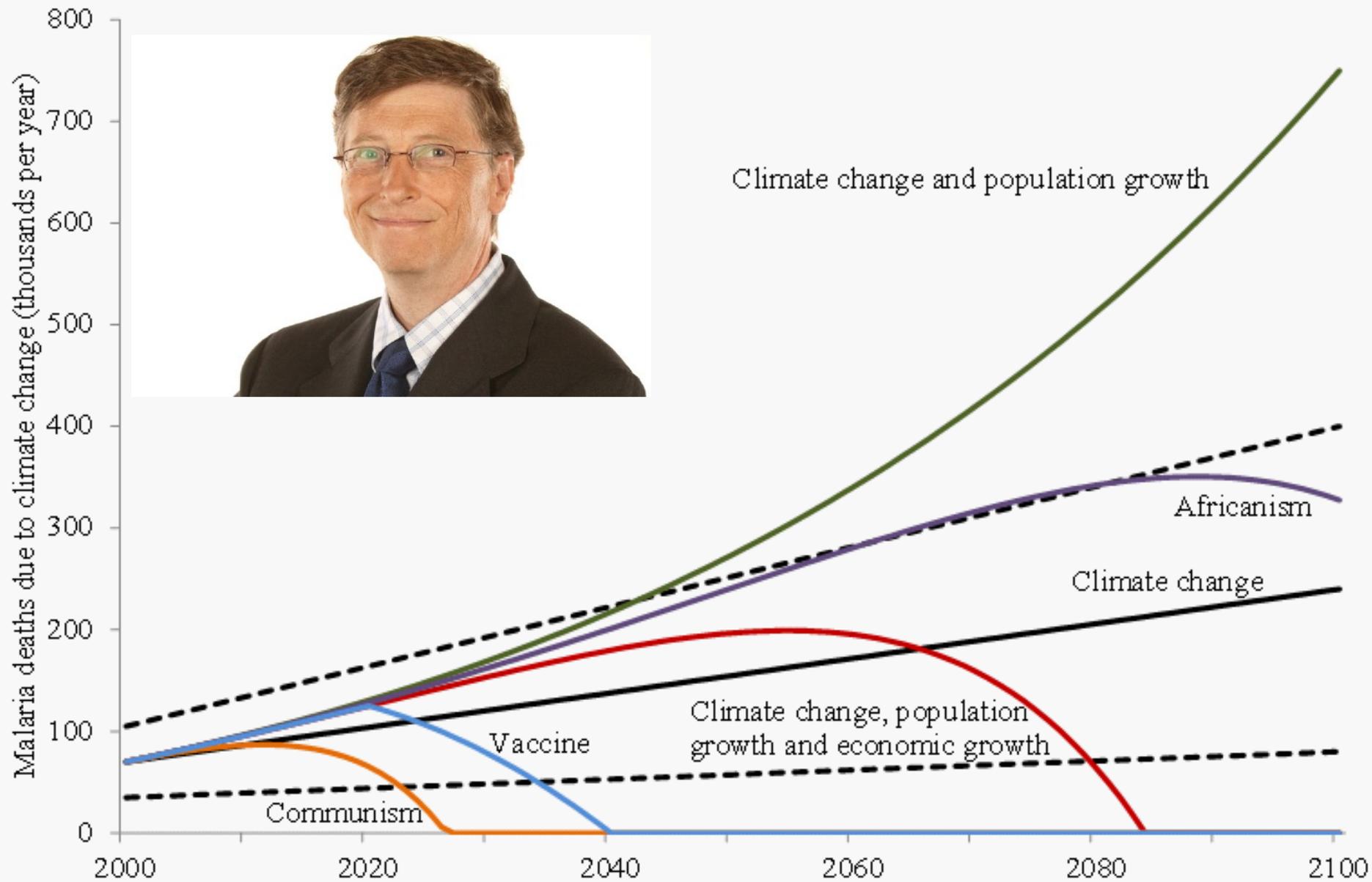
- DICE static vulnerability\*
- - DICE dynamic vulnerability
- FUND dynamic vulnerability\*
- - FUND static vulnerability
- - PAGE dynamic vulnerability
- PAGE static vulnerability\*







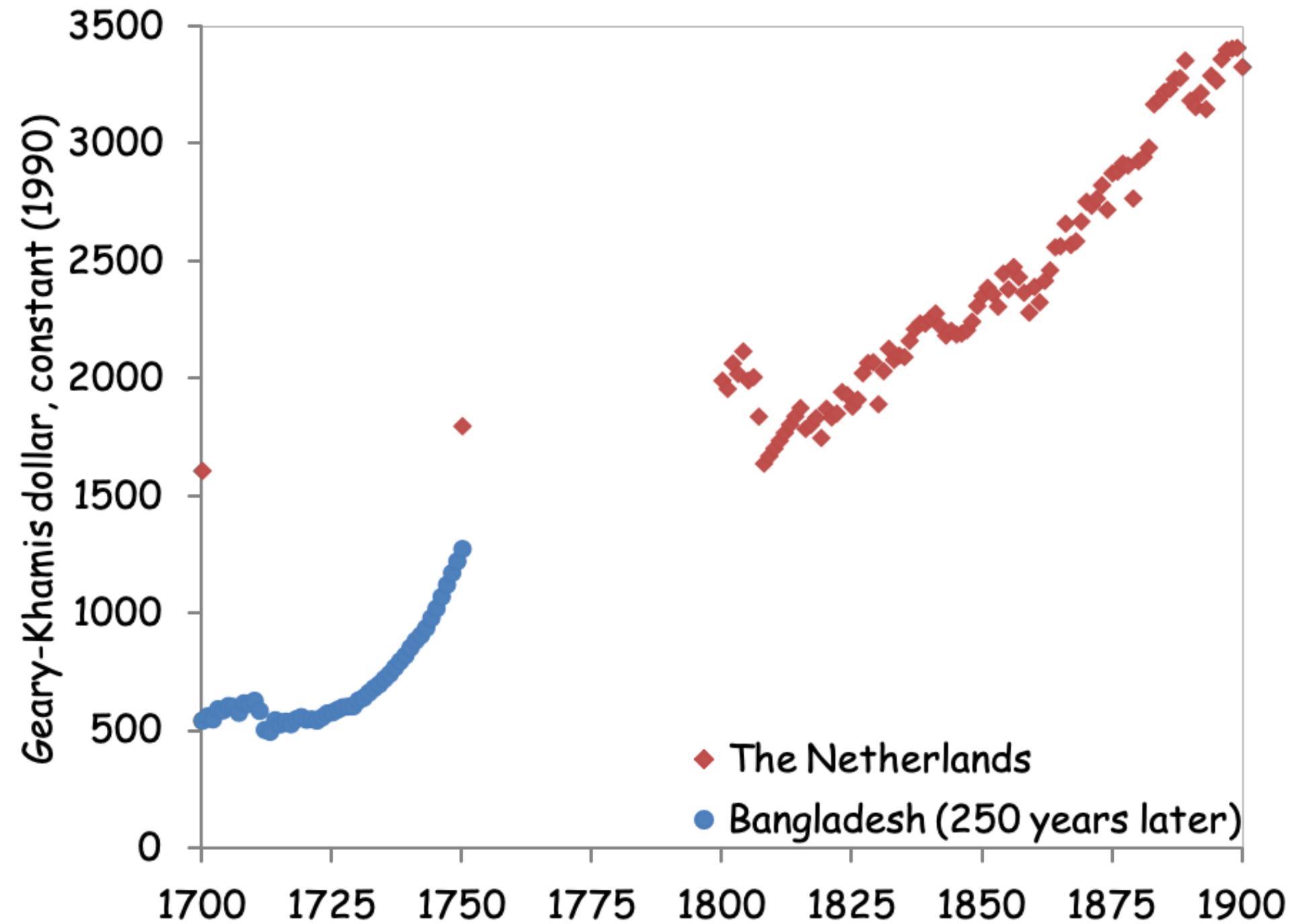




# Schelling Conjecture

- Nobel Laureate Tom Schelling asked
  - Why do we care about the grandchildren of people we do not seem to care about?
  - If we really do care about the impacts of climate change on the descendants of the current poor, are there better ways of helping them than through greenhouse gas emission reduction?
- Is adaptation assistance a better way to reduce the impact of climate change?



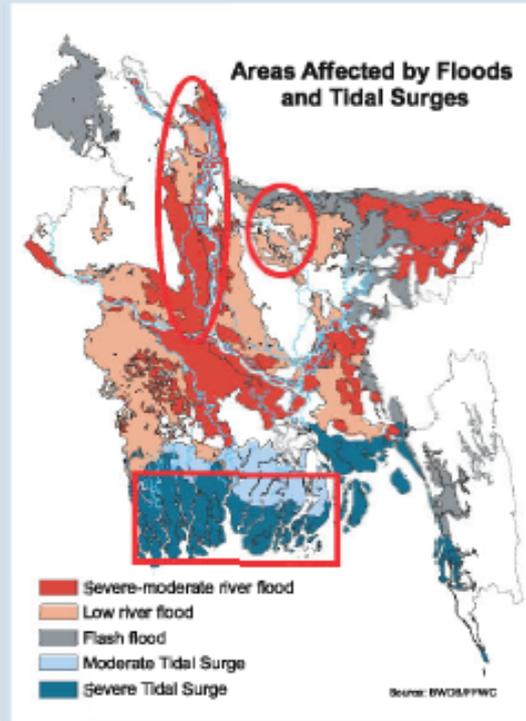
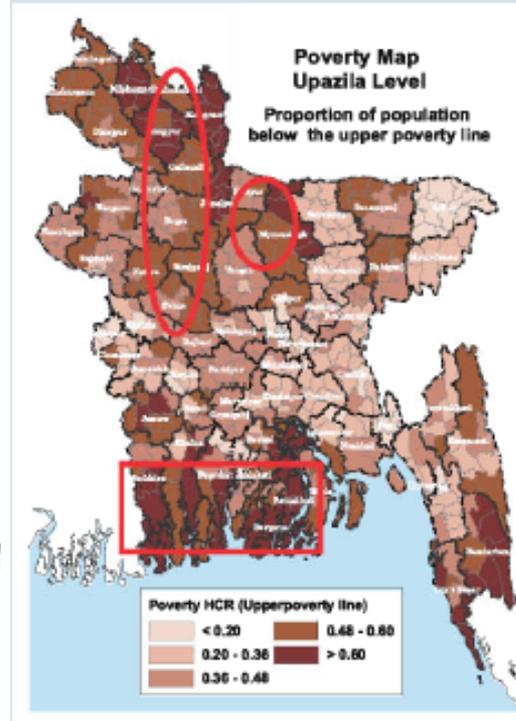


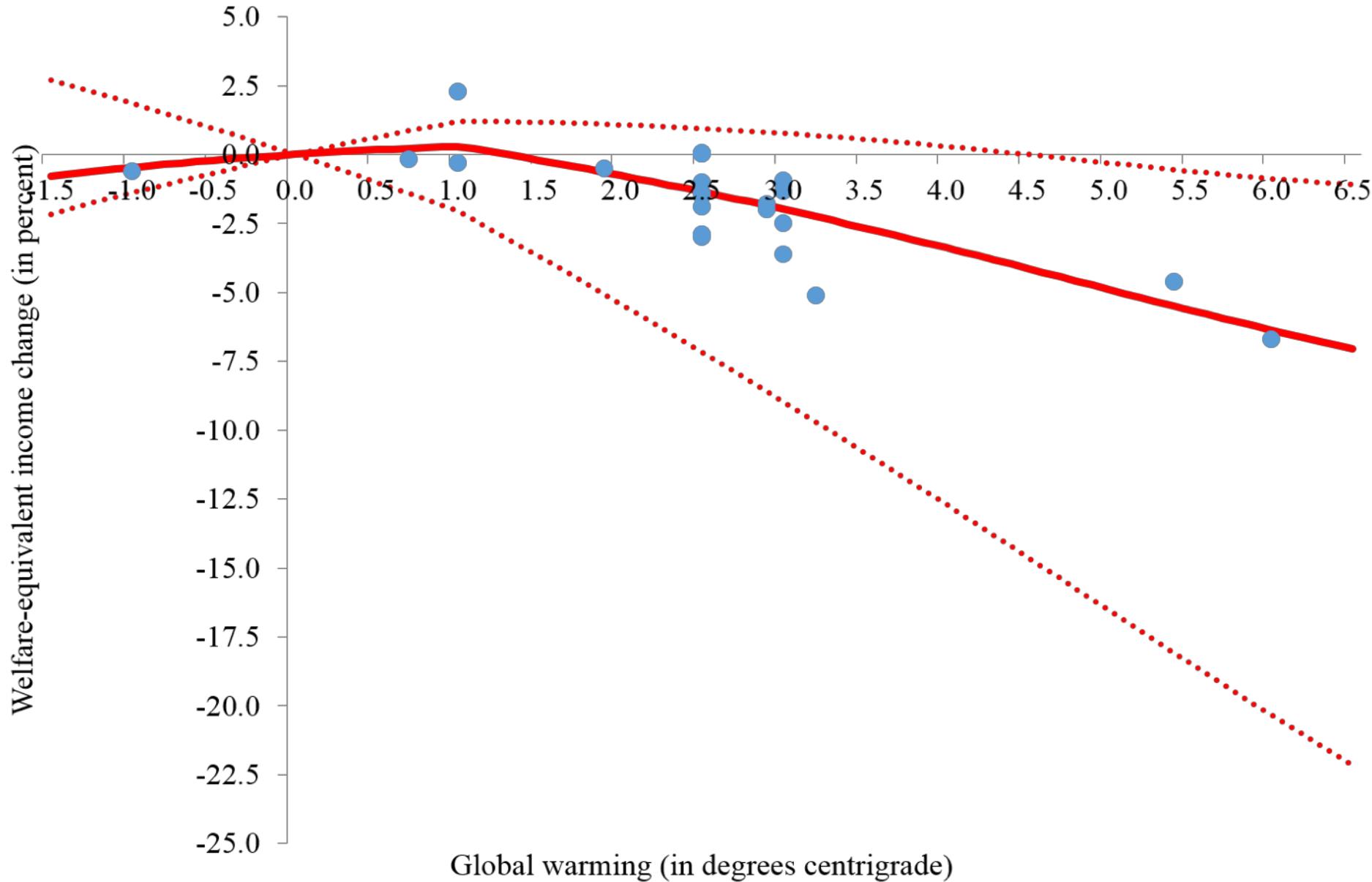


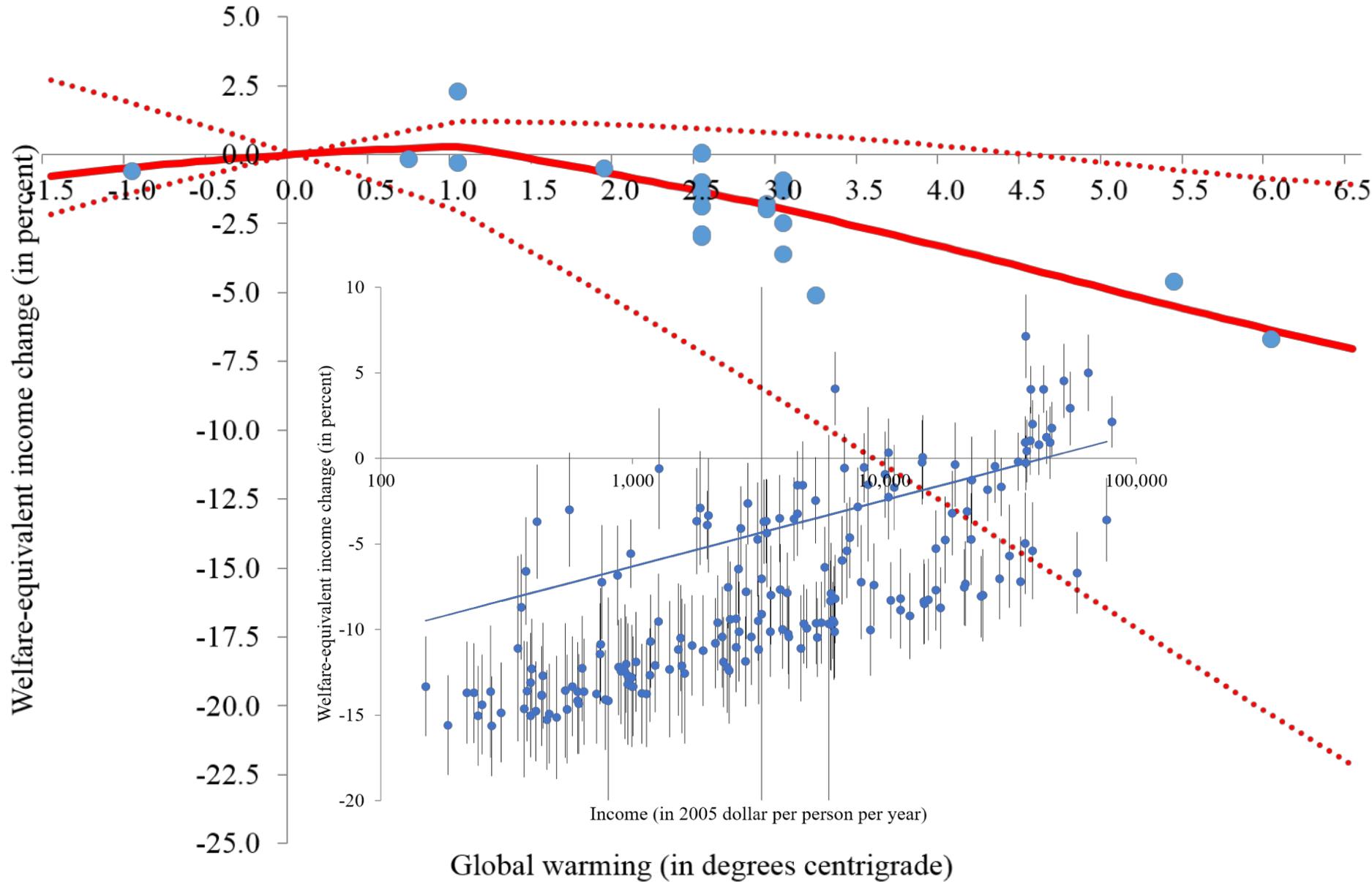


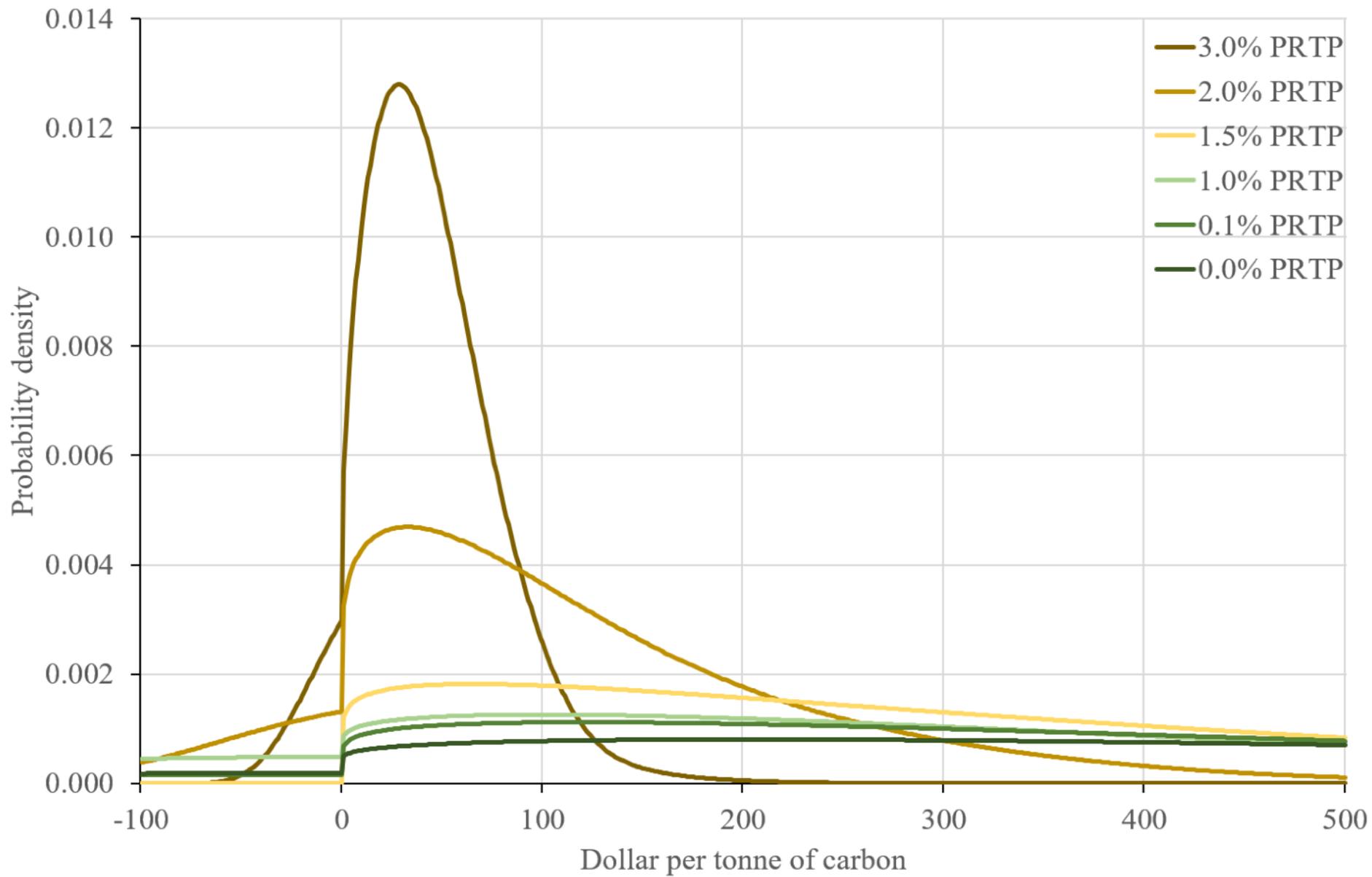
# Bangladesh

- Economically, Bangladesh is not far behind the Netherlands when it started its flood action plan
- Technically, Bangladesh is far ahead
- But, corruption is terrible, politics is antagonistic, and the poor do not carry much weight in decision making
- Floods are an Act of God, dikes blasphemy





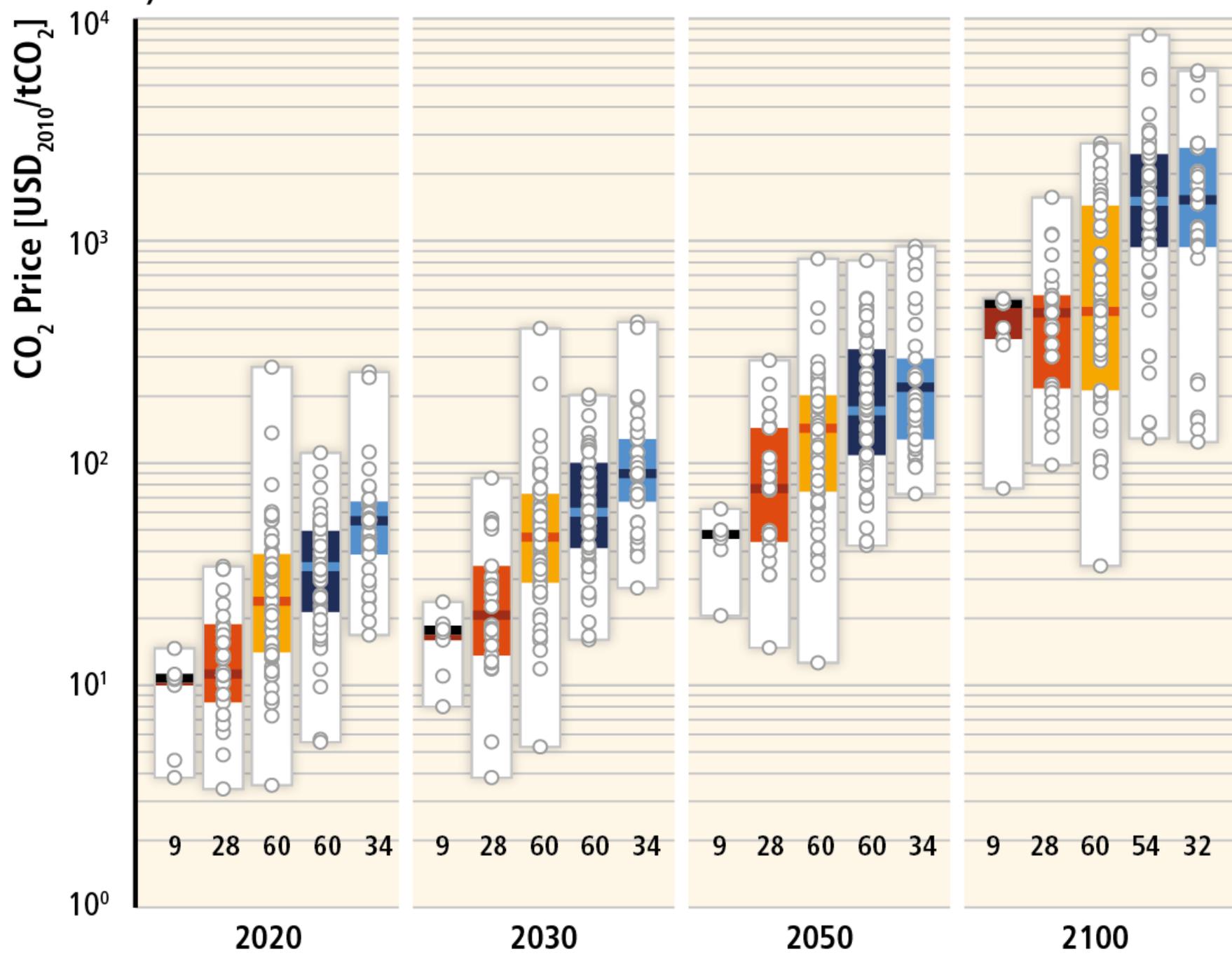


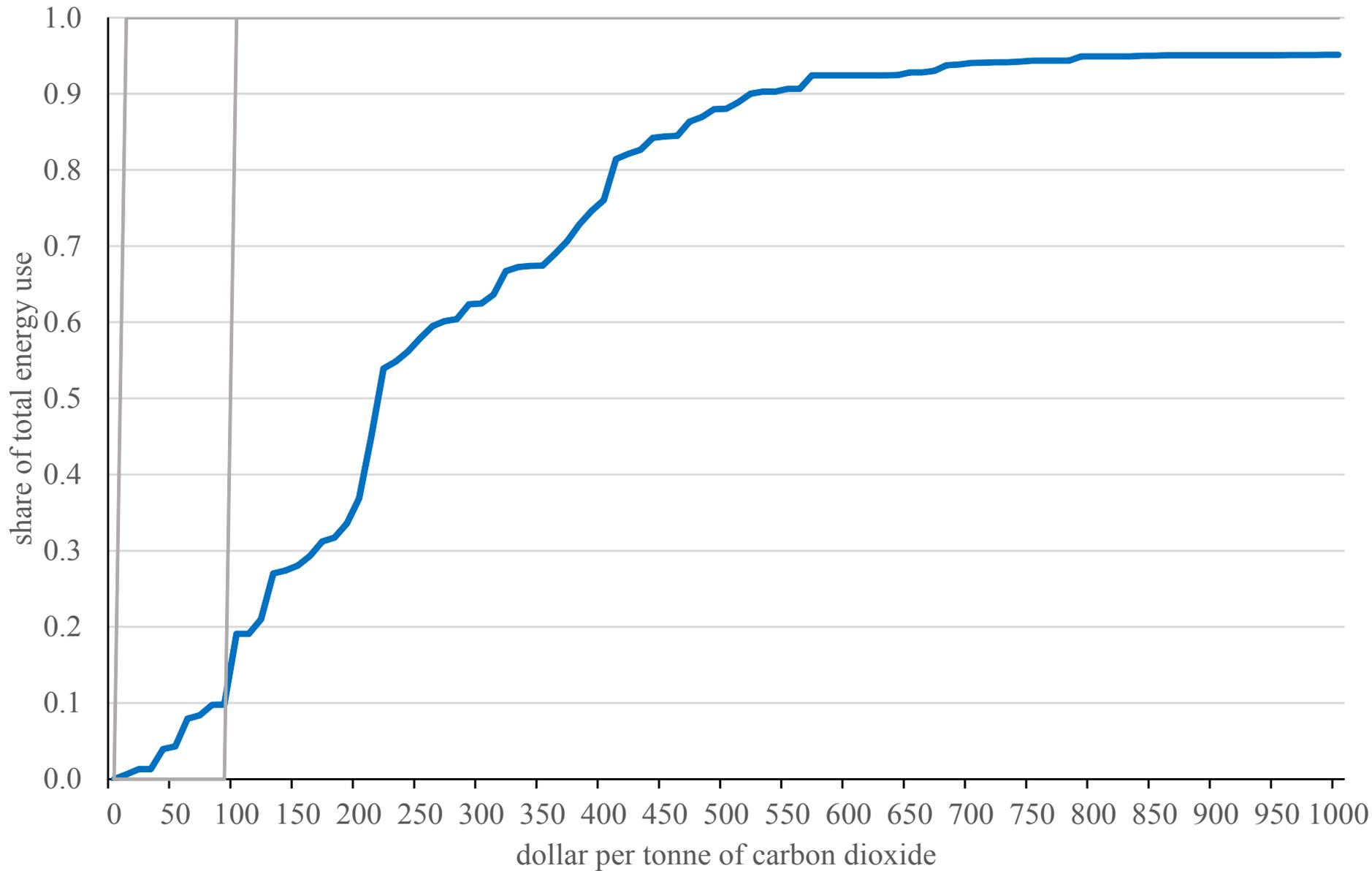


# Social cost of carbon, \$/tC

PRTP	Mode	SD	Mean
0%	202	644	686
1%	100	471	378
3%	28	35	<b>43</b>
EU ETS	59	May 2018	
CARB	55	Feb 2018	
Macron	81-137	failed	
\$43/tC	petrol	€0.02/l	
	power	€0.003/kWh	

a) Carbon Prices 2020–2100





Private benefit of carbon, \$/tCO<sub>2</sub>

# Social cost of carbon, \$/tC

	0.5	1.5	2.5	3.0	4.5	6.0
-0.00	1.4	8.4	20.9	29.3	62.7	108.8
-0.18	1.0	6.1	15.1	21.1	45.2	78.2
-0.36	0.8	4.5	11.2	15.6	33.3	57.5
-0.72	0.5	2.7	6.5	9.1	19.3	33.4

Social cost of carbon as a function of the equilibrium climate sensitivity (columns) and income elasticity of impacts (rows).

Model = parabola; scenario = SRES A1;

pure rate of time preference = 1%; rate of risk aversion = 1

# Wrap-up

- Climate change has a moderate, negative impact of human welfare
- Many of the larger impacts of climate change are symptoms of underdevelopment
- Estimates of the social cost of carbon suggest that optimal emission reduction is modest