A photograph of a woman in a rural setting, likely Sub-Saharan Africa, working in a field. She is wearing a blue headwrap and a brown dress, and is carrying a large sack on her head. She is bending over, working with the soil. In the background, there are other people and some huts under a clear sky.

Analysis of IR

PS 1599 | Week 2: Welfare and Technology

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Admin

- Office hours
- Email
- Website (slides)

What did we talk about last time?

Today

- Last time:
 - Welfare can be a legitimate goal for humankind
- Today (and next week):
 - Definition of welfare (+measurement)
 - History global/European development
 - Connection to technology

Welfare: definition and measurement

- Welfare = good
- True for both **utilitarianism** and **egalitarianism**
- Okay, but *what* is welfare?
- In practice: vastly diverging views.

How would you define
(and measure) welfare?

- Not an academic question
- Two approaches to define welfare
- 1st: **subjective**. Let people say what makes them “well”
- **Pros:** flexible, respectful of personal views
- **Cons:**
 - Are all personal views legitimate in society?
 - Hard to measure

- 2nd approach: **objective**. Decide for all of us what is ‘legitimate’ welfare.
- Potential candidates: physical well-being, happiness, equality of opportunity, access to resources, etc
- **Pros:** avoids ‘bad’ preferences; can be measured
- **Cons:** defines welfare in a narrow way (spiritual? etc.)

Two things to note...

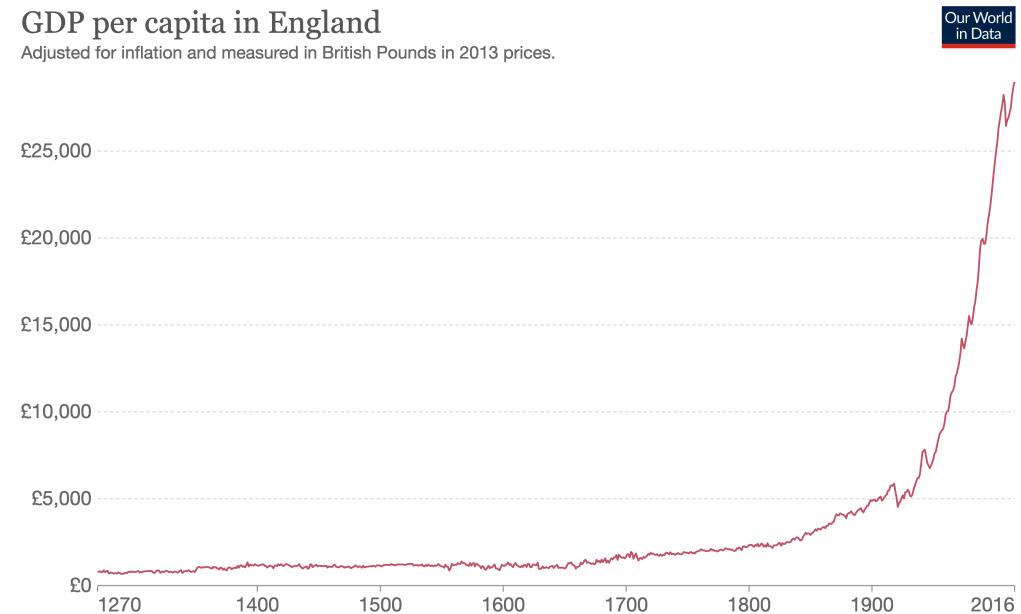
- 1. These obj measures can be equated to “development”
- Narrow version: how “modern” an economy is
- Amartya Sen’s version: economic opportunities + political freedom + protection from extreme poverty
- Broad version: adds social stuff (gender rights, etc.)
- Often criticized: western-centric, materialistic
- Often measured by the Human Development Index: schooling + GNI (similar to GDP) + life expectancy

- 2. Most measures can be proxied by **economic growth**
- Often measured by GDP:
 - Value of goods+services produced in a region over time
 - Eg GDP of Pennsylvania for 2022 is \$722b
- Note:
 - Not the same as household income/wage, but close
 - Doesn't tell us about **distribution** of income
 - Economic growth ≠ development

Physical well-being

GDP per capita in England

Adjusted for inflation and measured in British Pounds in 2013 prices.

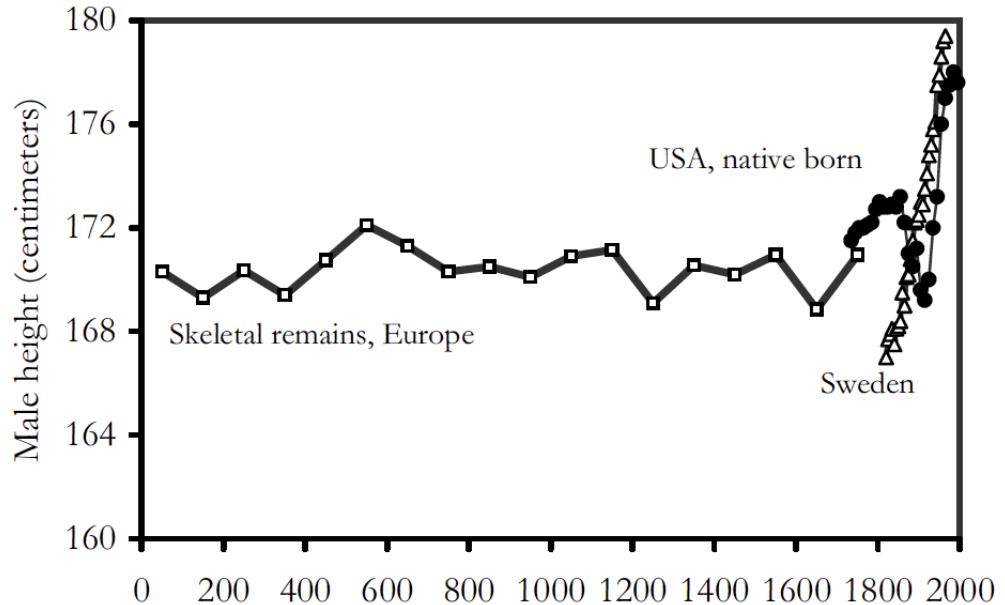


Source: Broadberry, Campbell, Klein, Overton, and van Leeuwen (2015) via Bank of England (2020)

Note: Data refers to England until 1700 and the UK from then onwards.

OurWorldInData.org/economic-growth • CC BY

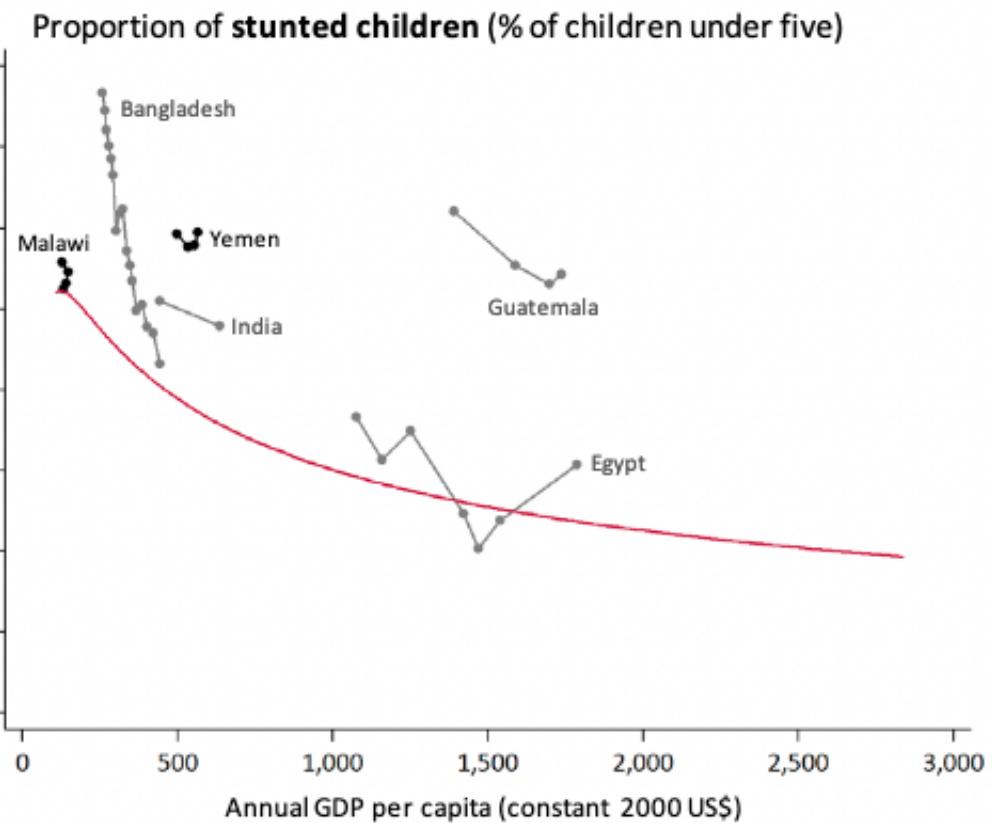
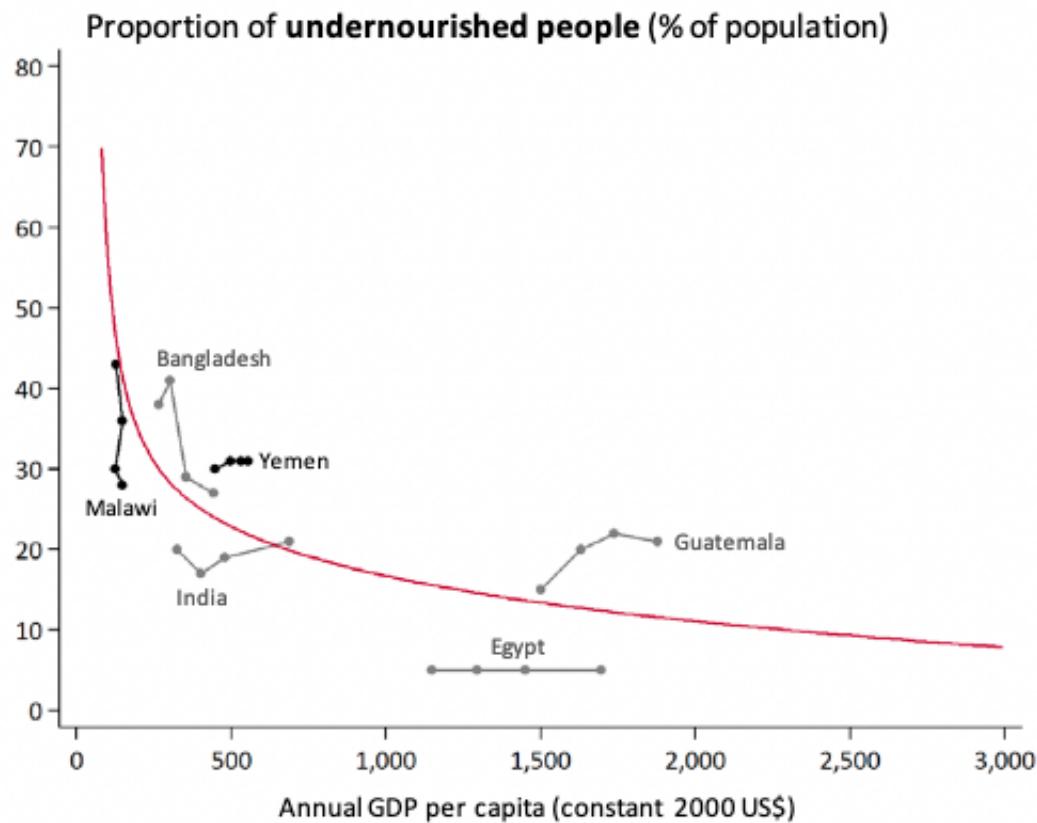
Our World
in Data



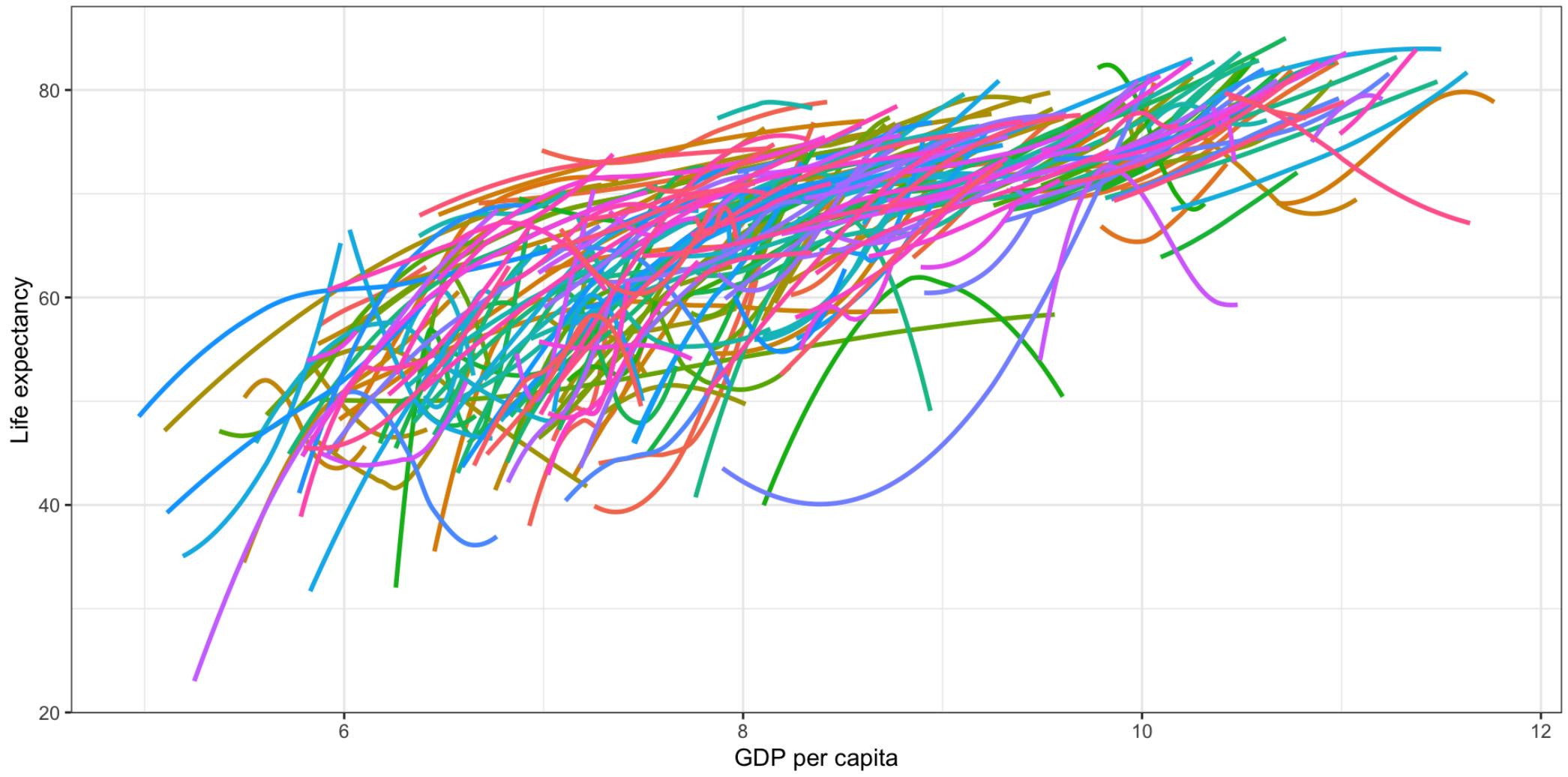
Source: Clark (2008).

Figure: OwD. Source: Bank of England.

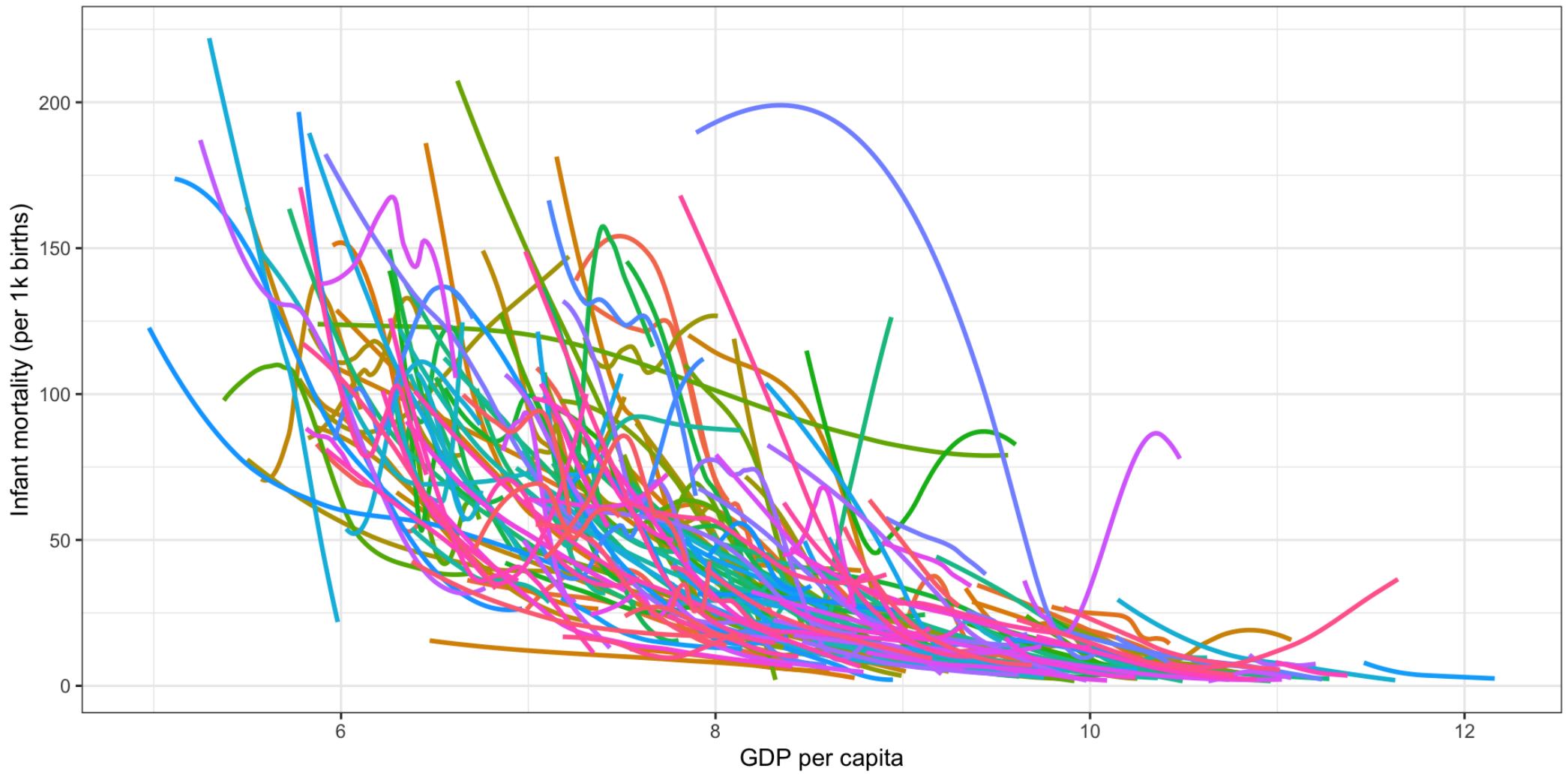
Figure 1: Height



Nutrition. Source: Ecker, Breisinger, and Pauw (2011).

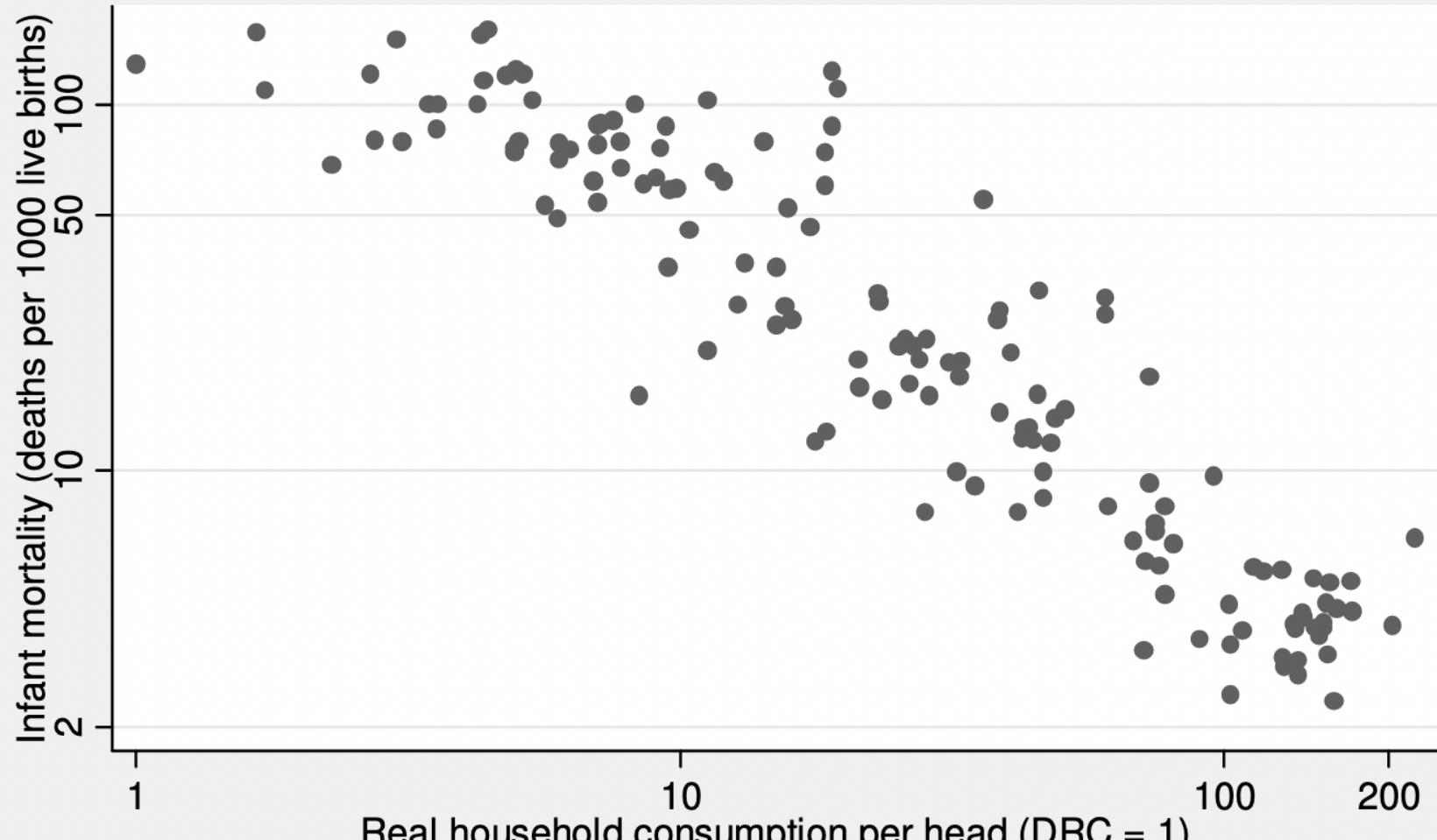


GDP per capita and life expectancy. Figure: Aklin. Source: WDI.



GDP per capita and infant mortality (death per 1,000 births). Figure: Aklin. Source: WDI.

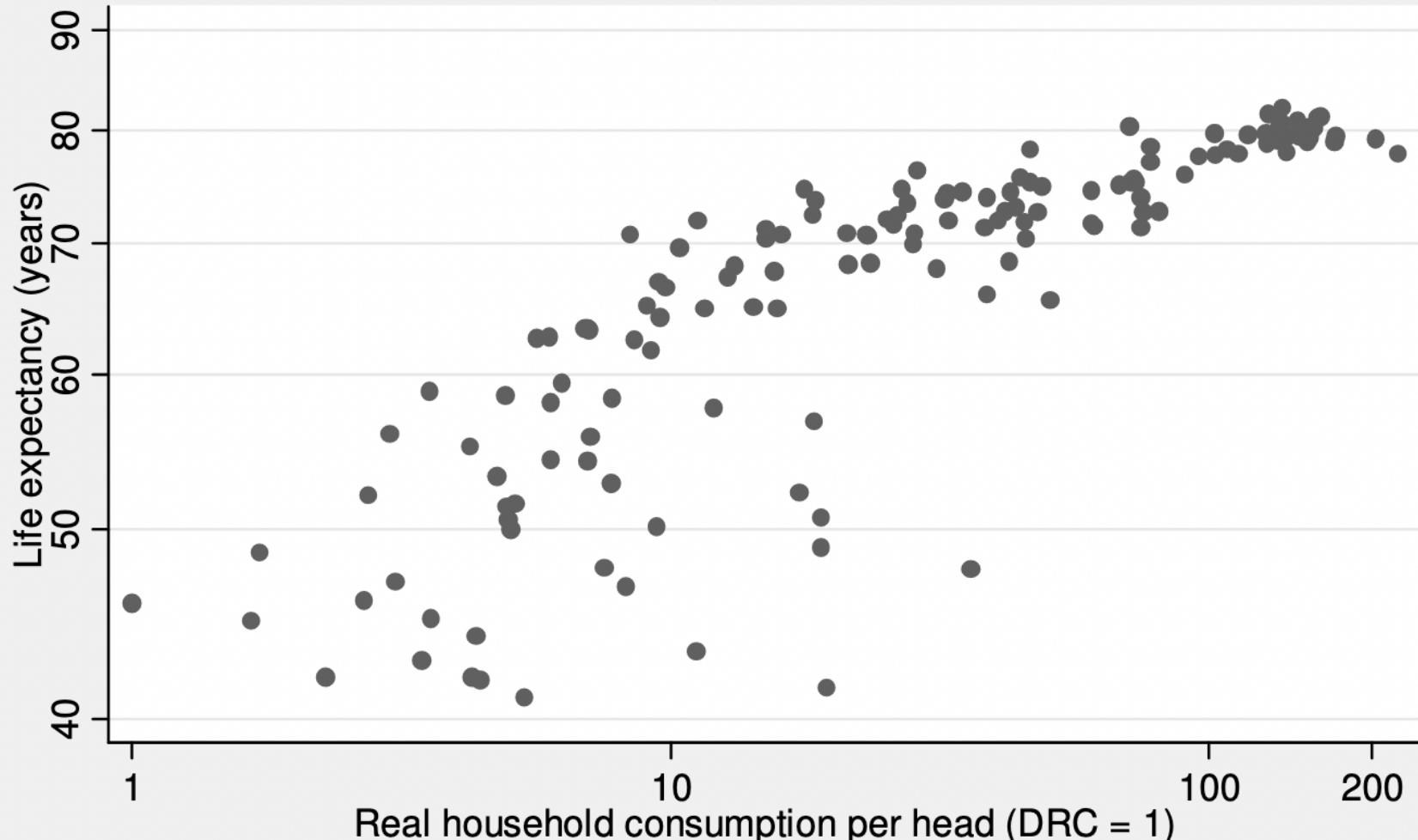
Infant mortality versus household consumption per head (log scales)



Notes: 146 countries. Household consumption deflated by EKS Fisher PPP.

Source: Oulton ([2012](#)).

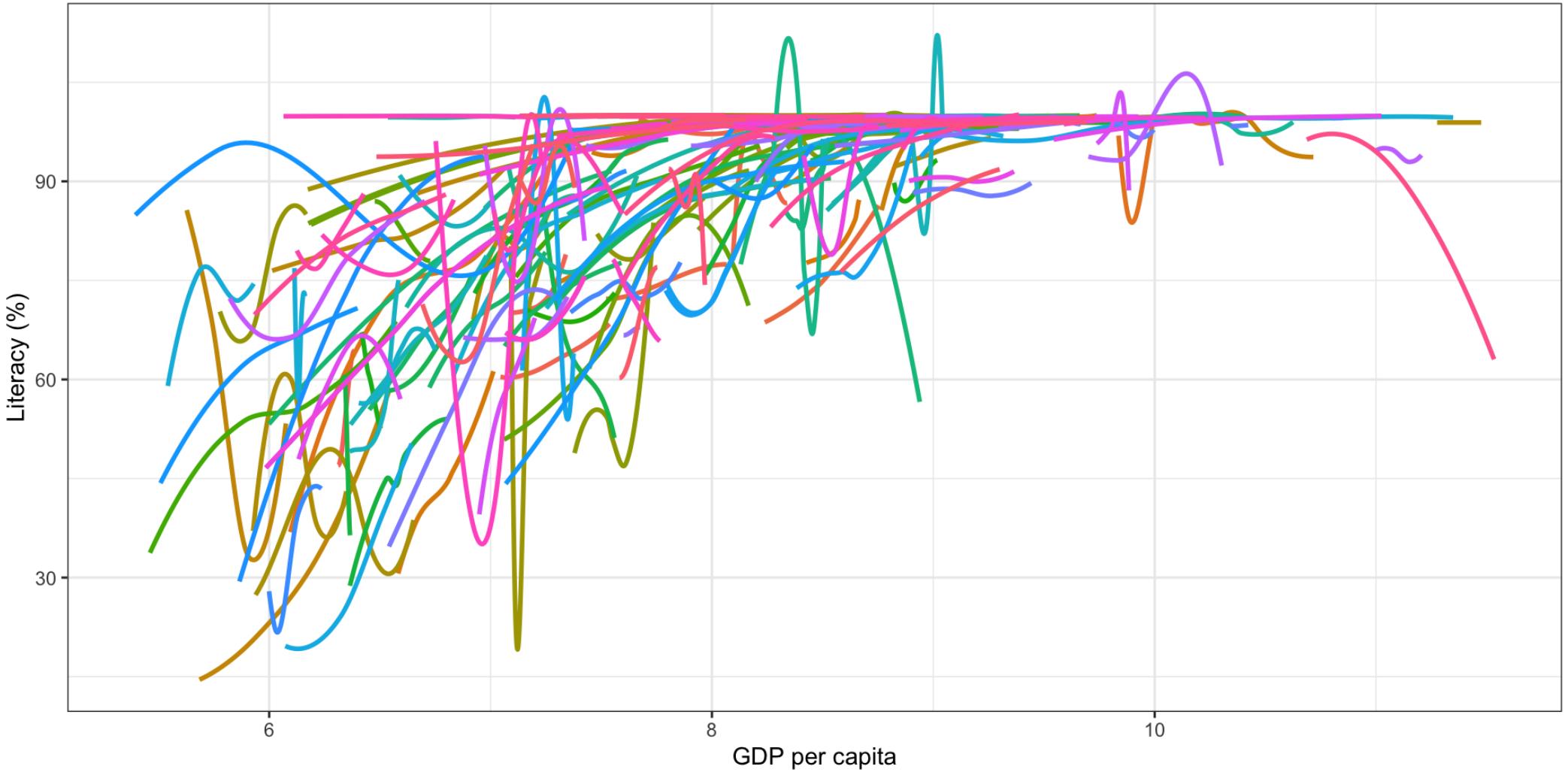
Life expectancy versus household consumption per head (log scales)



Notes: 144 countries. Household consumption deflated by EKS Fisher PPP.

Source: Oulton ([2012](#)).

Opportunities



GDP per capita and literacy. Figure: Aklin. Source: WDI.

Happiness

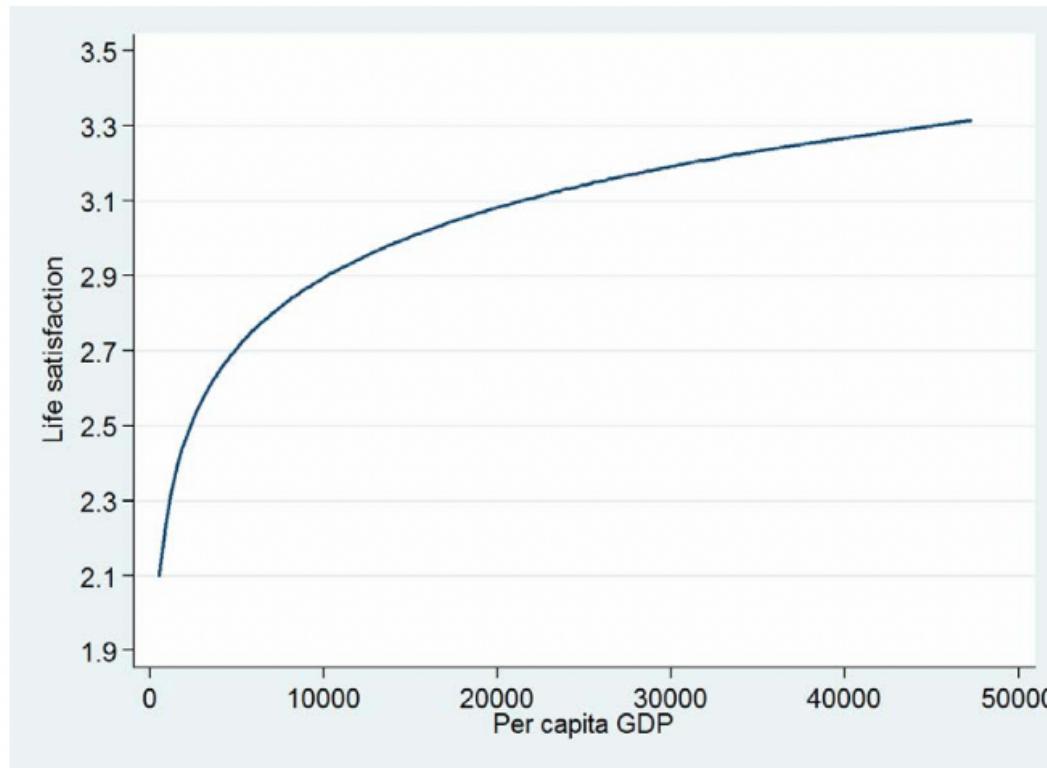
- Happiness: end goal?
 - Locke: yes! Bentham: yes!
 - US declaration of independence: yes!
 - But remember: could be happy for bad reasons
- Does happiness increase with economic development?
 - Yes [within and across countries](#)
 - Not [over time](#)
 - = Paradox of happiness (Easterlin 1974)
 - One explanation: hedonic treadmill

Individual effect of income

Figure 1

Diminishing Marginal Utility of Income

[Life Satisfaction and GDP per Capita (Absolute Scale) Based on WVS Cross Section (n=195)]



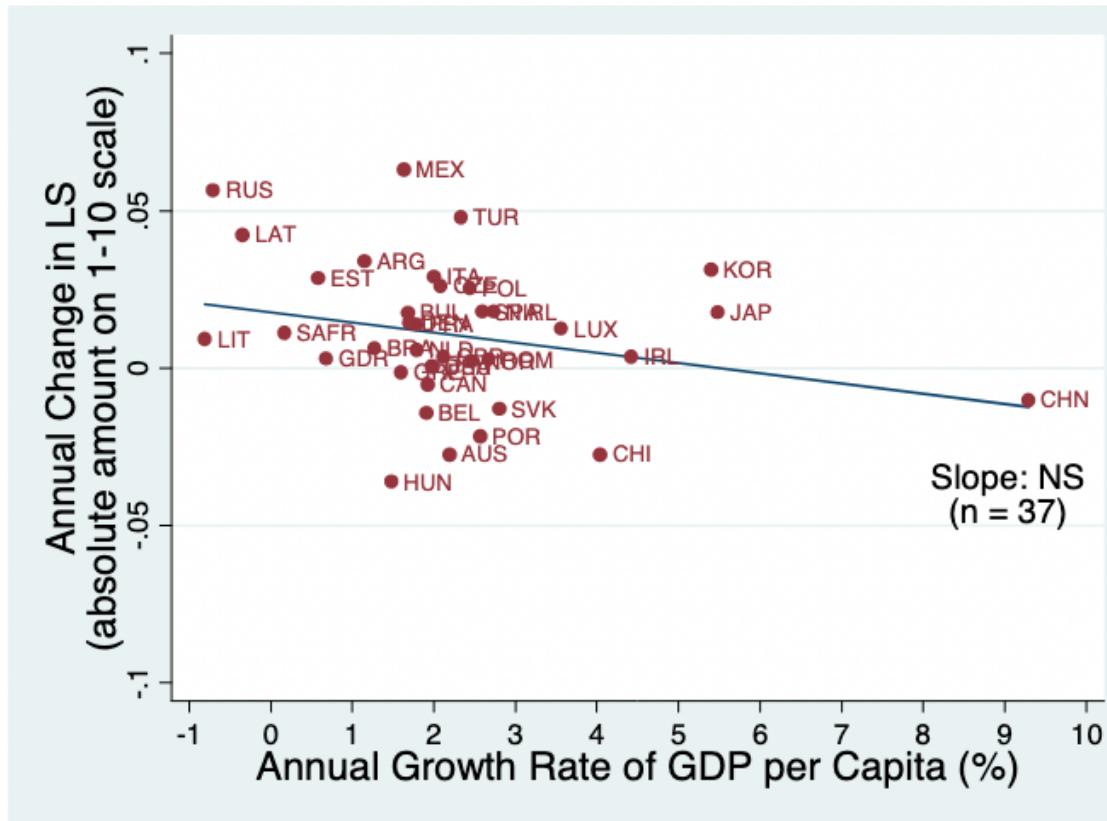
Source: The basic data are 195 pooled observations for 89 countries surveyed in waves 1-4 of the World Values Survey. Individual country observations are omitted from the figure. The fitted regression is $y = 0.405 + 0.270\ln(x)$ (adjusted $R^2 = 0.452$); t-statistics in parentheses.
(2.05) (12.68)

Source: Easterlin and Angelescu 2009.

Aggregate effect of income over time

Figure 6

Longer Term Relationship between Growth Rates of Life Satisfaction and GDP per Capita: 17 Developed, 11 Transition, and 9 Developing Countries (12-34 Years; Mean=22)



Source: See text. The fitted regression is $y = 0.018 - 0.003x$ (adjusted $R^2 = 0.069$); t-statistics in parentheses.
(3.07) (-1.61)

Source: Easterlin and Angelescu 2009.

Summary so far

- a. What we want: improve people's **welfare**
 - Reason: welfare is plausibly a **just** goal!
- b. What determines welfare? **Economic growth/development**
 - Welfare could be equated to well-being
 - Development correlates highly with well-being
 - Thus: development is probably good!
- Next Q: how do we get development?

History of development

Development vs growth

- **Growth:** increase in prod and diversity of goods and services
- **Development:** deep econ transformation (+pol & social)
 - Example: shift from manufacturing to services
- Note:
 - Growth w/o development is possible
 - Development w/o growth is possible
 - But the two are generally connected

- Development is continuous, but two critical junctures
 1. Neolithic period (“Stone Age”) (~12,000 BCE)
 2. Industrial revolution(s) (~1760-1890s)

1. Neolithic revolution

Pre-neolithic period

- Early homo sapiens: nomadic hunter-gatherers
- Strong limits on population growth
 - Europe: 1 person needed ~4 sq miles
 - Tropical regions: 1 person needed 0.4 sq m
- Implications?
- Small tribes, no surplus, few activities outside of food, no trade, no innovation

Neolithic period

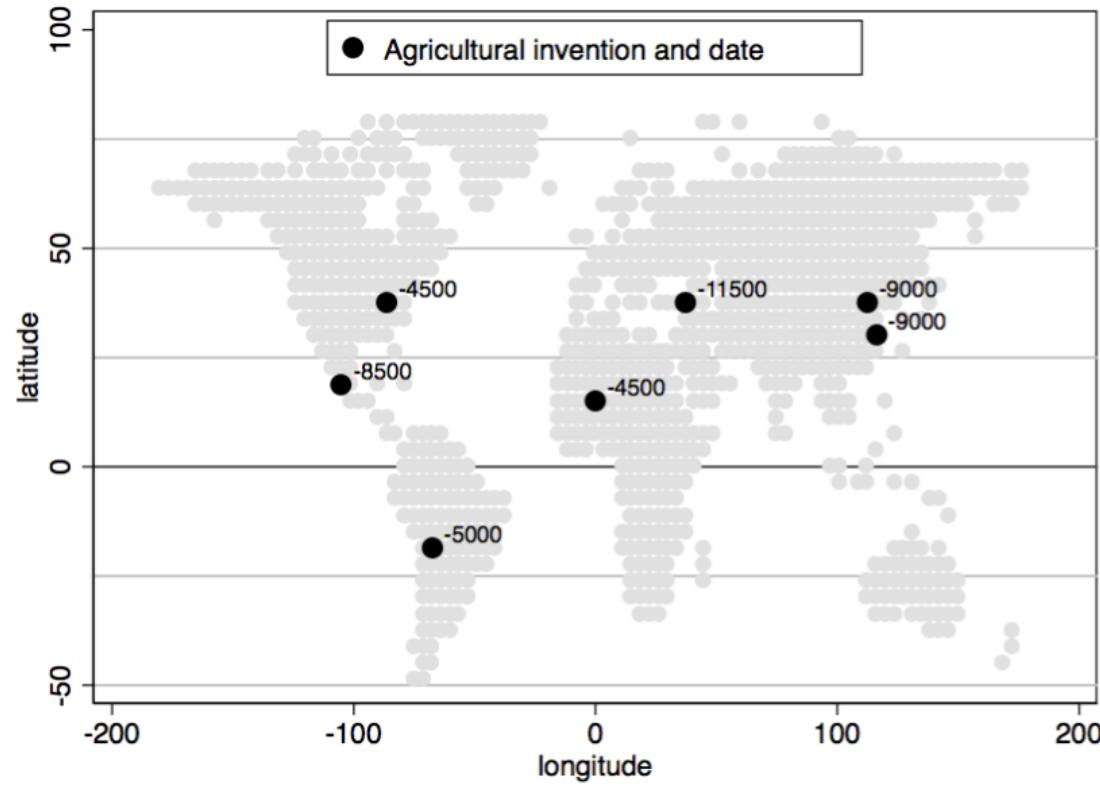
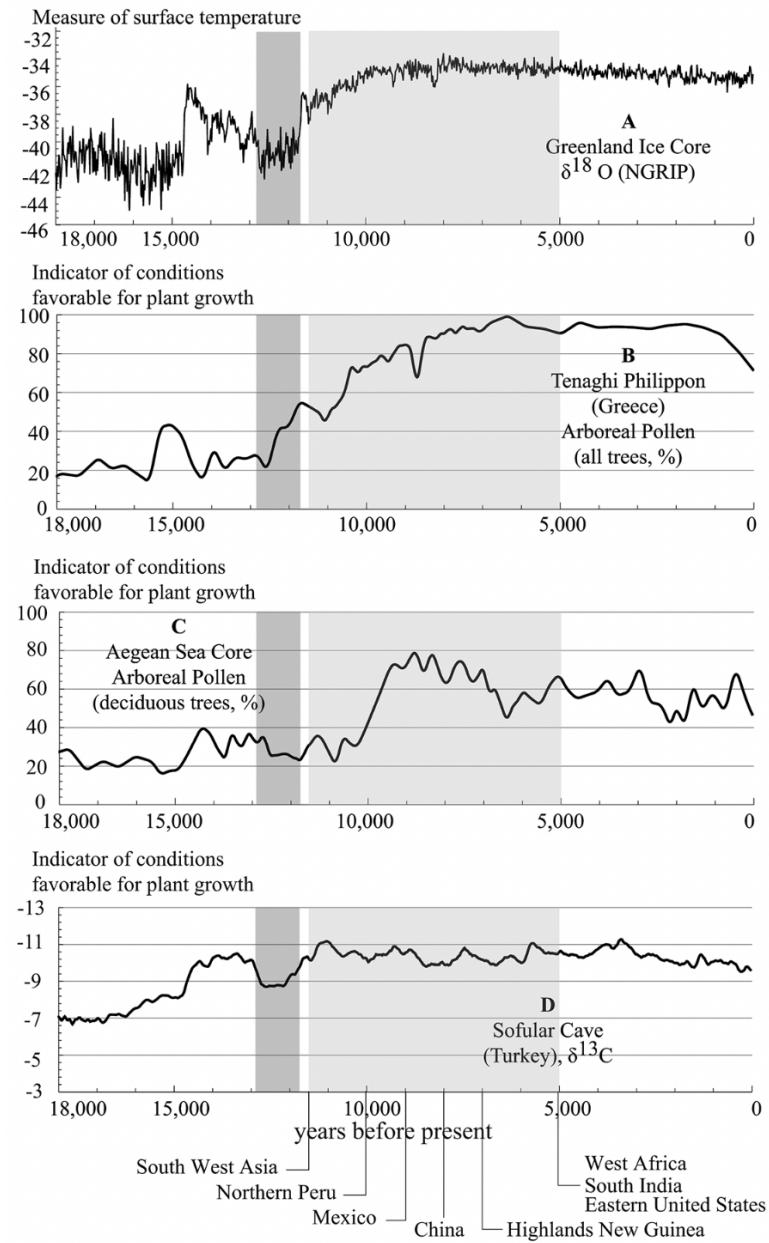


Figure 2: The locations where agriculture was invented and their respective dates in years before present.

Source: Matranga (2022).

→ New technology: agriculture (Bairoch 1997)

- Causes: climatic change
 - End of Last Glacial Period (~12,000 BCE)
 - Higher temperatures = harder to hunt
 - Longer dry season: need food that can be stored
- Additional causes: social development, property rights (animals, storage, gardens)



Source: Bowles and Choi (2019)

Consequences of Neolithic revolution

- Short term: few benefits (smaller, more joint health issues)
- Long term: radical transformation...
- **Population:** agri surplus → larger pop
- **Labor:** non-farming jobs (crafts, trade)
- **Social:** development of **cities**: Middle East: ~3500 BCE,
Harrapa (Punjab, India): ~2000 BCE, China: ~1400 BCE
- **Laws** and **institutions**: Hammurabi code (1750 BCE),
common defense, taxes, etc.
- Civilizations Mesopotamia, Egypt, Greece, Rome

2. Industrial revolution

- Misnomer...
- Period of profound **economic** (sup & dem), **social**, **political** transformations
- Shift from agriculture to industry
 - 1st Industrial rev: ~1760-1830 (UK)
 - 2nd Industrial rev: 1880-1890
 - Since then: 3rd and 4th IR
- Enabled by new energy tech: steam, coal, oil, electricity

England

	1500	1700	1900	1950
Calories	1.8k	2.2k	3k	3.1k
Life expectancy	34	38	46	69
Location	Rural	Rural	Rural	Urban
Literacy rate	5-15%	~50%	90%+	95%+
Cities >500k	2	7	44	

Context: Medieval times and Renaissance

1600s

- Change centered around western Europe starting in 1600s (“Age of Reason”)
- Expansion of regional+global markets (goods, finance)
- Growth of science: physics, statistics, philosophy
- Development of modern state (property rights+law, “proto-democracy”)
- But little change in welfare

1st Industrial revolution

Broader view

Major impact

- Overall improvements of life quality
- Ambiguous short-term impact (wages, growth)
- Long-term decline of rural areas
- Emergence of urban poor (“proletariat”)
- Expansion of public services for labor
 - Schools
 - Health

Deep causes

- Hard to ascertain
- Hypotheses:
 - “Culture” (Max Weber, etc.)? But Belgium...
 - Colonies? Small and poor...
 - Political institutions? But Netherlands...
 - Energy? Netherlands vs. Belgium...
- Critical role played by changes in
 - Agriculture: weaker demand
 - Industry: stronger demand

2nd Industrial revolution

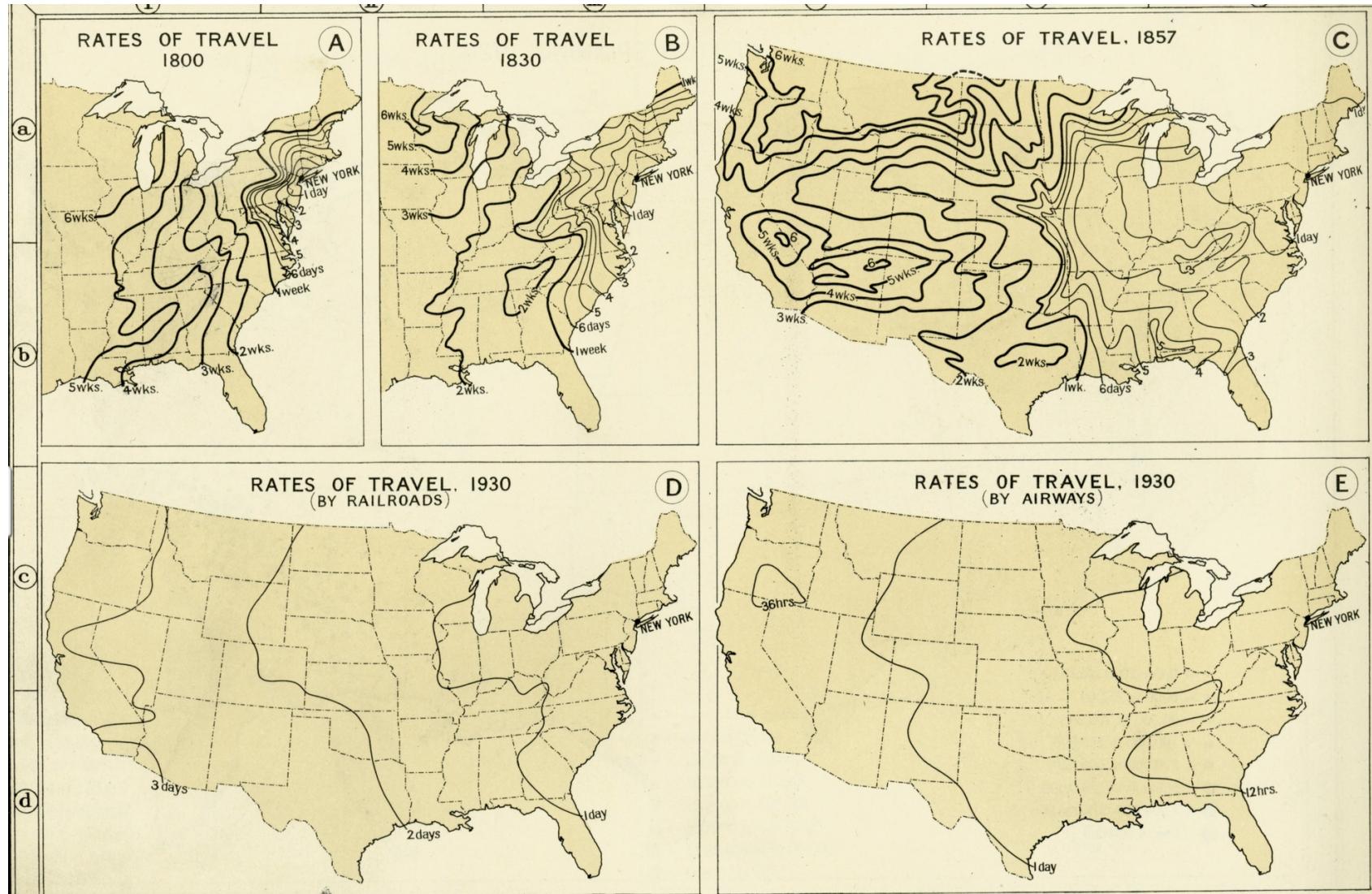
- 1st IR: low growth.
- Not surprising:
 - Industry is small at the time
 - Innovations take time (eg internet)
- 2nd half of 1800s:
 - 2nd generation of innovations
 - Transportation infrastructures (trains)
 - Energy infrastructures (grid) (factories, HH)

Impact

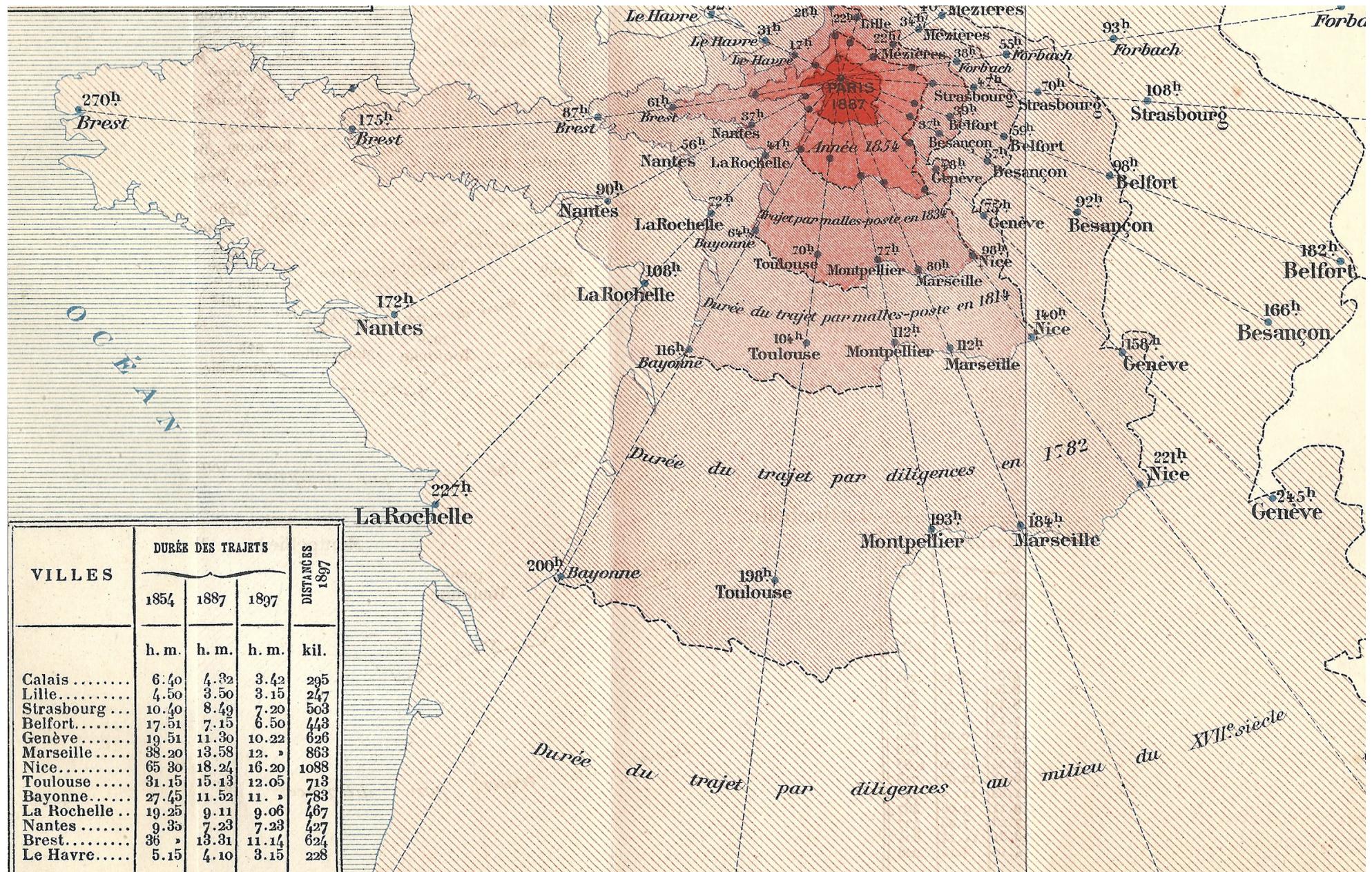
What were the consequences
of the 2nd Industrial revolution?

Consequences

World is becoming small



Isochrome map of US. Source: Atlas of the historical geography of the United States



Isochrome map of France

Some consequences

- Labor market. Eg:
 - UK w/ train station → pop growth + shift male workers away from agriculture
 - Germany: train tracks → pop growth for bigger parishes
- Erasure of local culture. Eg France: 50% of pop doesn't speak French in 1789
- Urbanization: working class, marxism, demand for social protection, education

Questions?

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Source for title page painting: Jean-François Millet, “The Gleaners”

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