

# **Citizen Science: theory, practice and policy**

**(with case studies from UK & Germany)**

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UCL, Extreme Citizen Science group

# Plan

- 9:00-9:45 introduction to citizen science: history, trends that facilitate it, types of citizen science activities, examples of projects
- 9:45-10:00 Q&A about introduction, and the role of citizen science in projects
- 10:00-10:15 Designing and choosing Citizen Science activity
- 10:15-10:30 Introduction to citizen science activity – Environmental sensing: WideNoise, NoiseWatch, AirCasting or nature observation: iNaturalist, Anymals+Plants
- 10:15-11:00 data collection in the botanical garden or in the open areas of the university, working in groups of 2 or 3
- 11:00-11:15 discussion in group of 5 on the lessons from data collection
- 11:15-11:45 feedback from all groups and a discussion about implications for designing citizen science activities: data quality, difference between observers, overview of resources that are available for designing and evaluating citizen science activities
- 11:45-12:15 Policy aspects of citizen science across the world

# Learning Outcomes

- Knowledge of the field of citizen science and current trends that influence it
- Understand the principles and practical aspects of designing a citizen science project
- Experience of citizen science activity
- Learn about additional resources that can be used to design and run citizen science projects
- Understand the policy trends that are influencing the field

# Introduction to Citizen Science

- Citizen Science in a historical perspective – underlying trends
- Current activities in the area of citizen science online and offline
- Typology of engagement in citizen science

# Citizen Science (OED 2014)

**citizen science** n. scientific work undertaken by members of the general public, often in collaboration with or under the direction of professional scientists and scientific institutions.

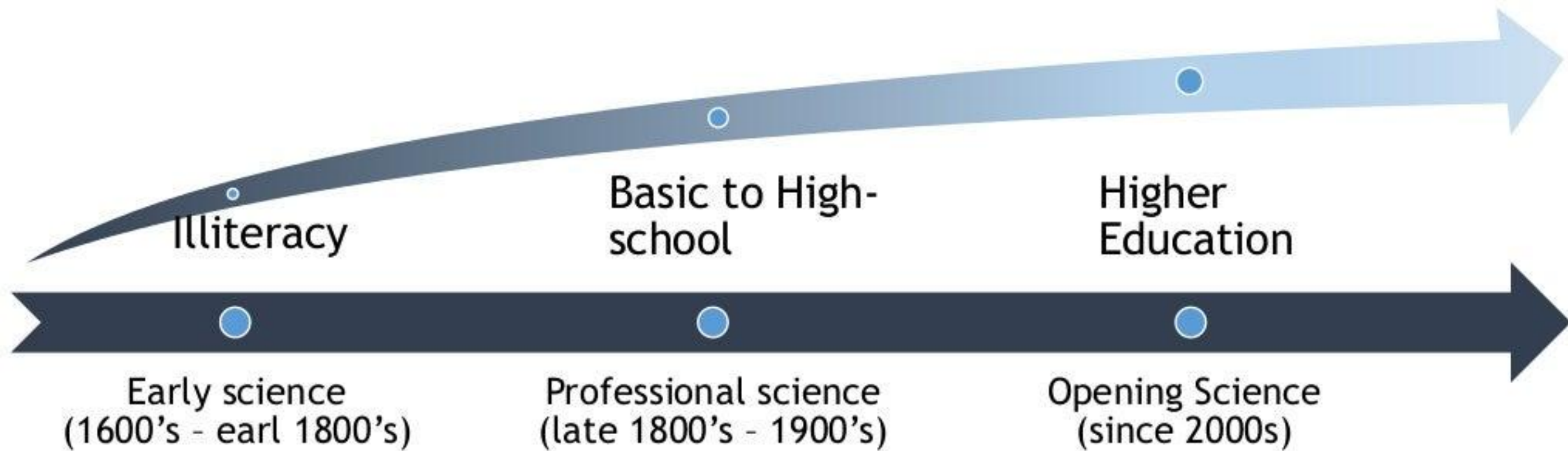
**citizen scientist** n. (a) a scientist whose work is characterized by a sense of responsibility to serve the best interests of the wider community (now rare); (b) a member of the general public who engages in scientific work, often in collaboration with or under the direction of professional scientists and scientific institutions; an amateur scientist.

# Citizen Science & Science





# Citizen Science & Science



# Citizen Science & Science

Citizen Science  
as Gentlemen/  
Gentlewomen  
science

Illiteracy

Basic to High-  
school

Early science  
(1600's - early 1800's)

Professional science  
(late 1800's - 1900's)

Mary Anning (1799-1847)





# Citizen Science & Science

Citizen Science  
as Gentlemen/  
Gentlewomen  
science

Citizen Science  
diminishing

Illiteracy

Basic to High-  
school

Early science  
(1600's - early 1800's)

Professional science  
(late 1800's - 1900's)

Volunteer rainfall observer Rick Grocke checks  
the rain gauge at Tanami Downs cattle station in  
the Northern Territory of Australia



# William Whewell, tides and volunteers

- William Whewell, Trinity College, Cambridge
- 1833: coined the term “scientist”
- 1835: tides observation
- Thousands of “subordinate labourers” assisting the scientist in his tasks



# The era of professional science

- Involvement continued: archaeology, astronomy, ornithology, conservation, meteorology ...
- No recognition, viewing volunteers as 'untrustworthy' contributors, that are better replaced by automated instruments



Shoemaker-Levy 9 on 17 May 1994



# Citizen Science & Science

Citizen Science  
as Gentlemen/  
Gentlewomen  
science

Citizen Science  
diminishing

Citizen Science  
as open &  
inclusive science

Illiteracy

Basic to High-  
school

Higher  
Education

Early science  
(1600's - early 1800's)

Professional science  
(late 1800's - 1900's)

Opening Science  
(since 2000s)

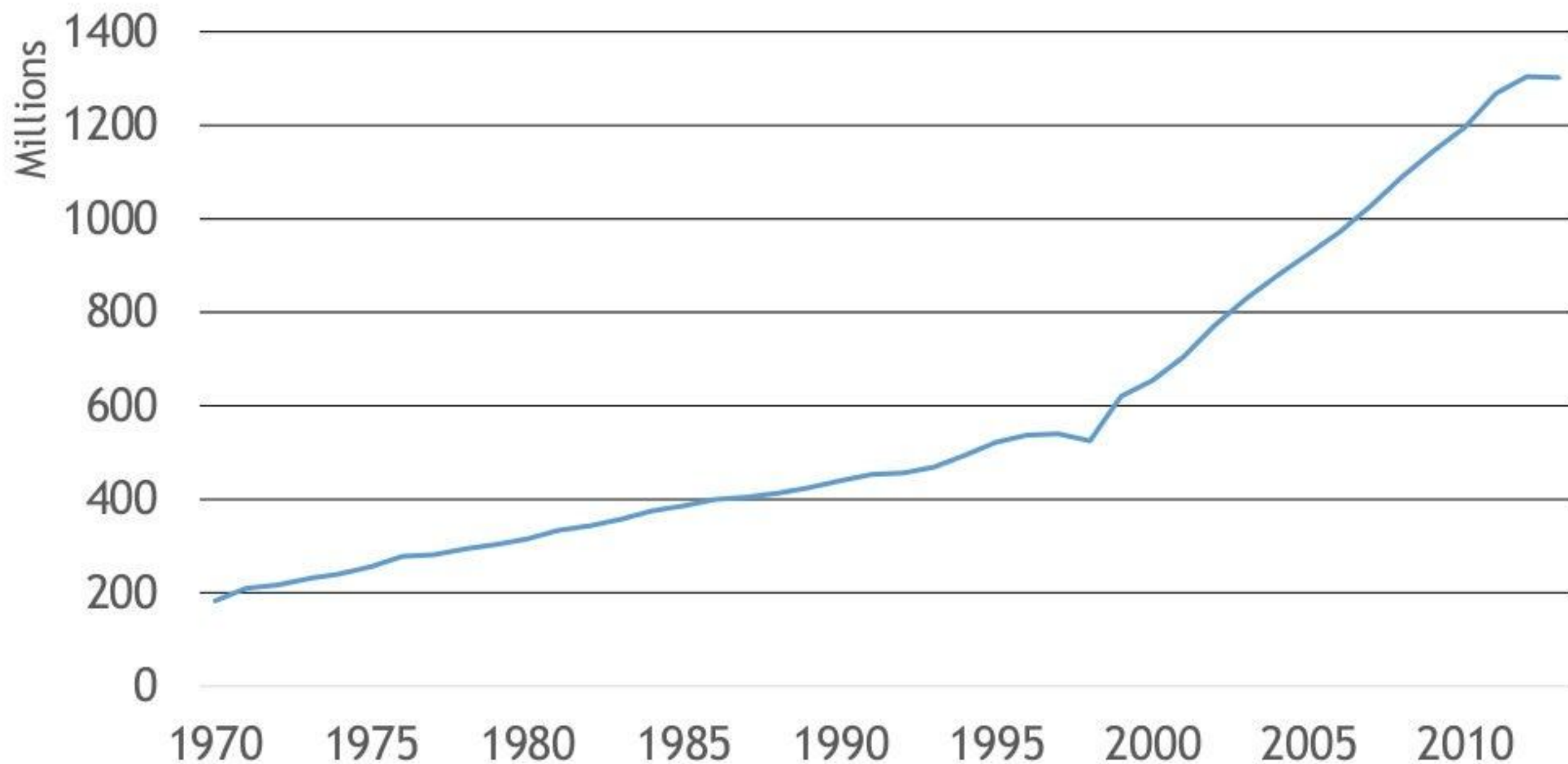
# Citizen Science: why Now?

- Societal trends:
  - Education and qualifications
  - Leisure
  - Sharing economies / peer production systems
- Technological trends:
  - Internet access (broadband)
  - Mobile devices
  - Collaborative Web
  - DIY electronics

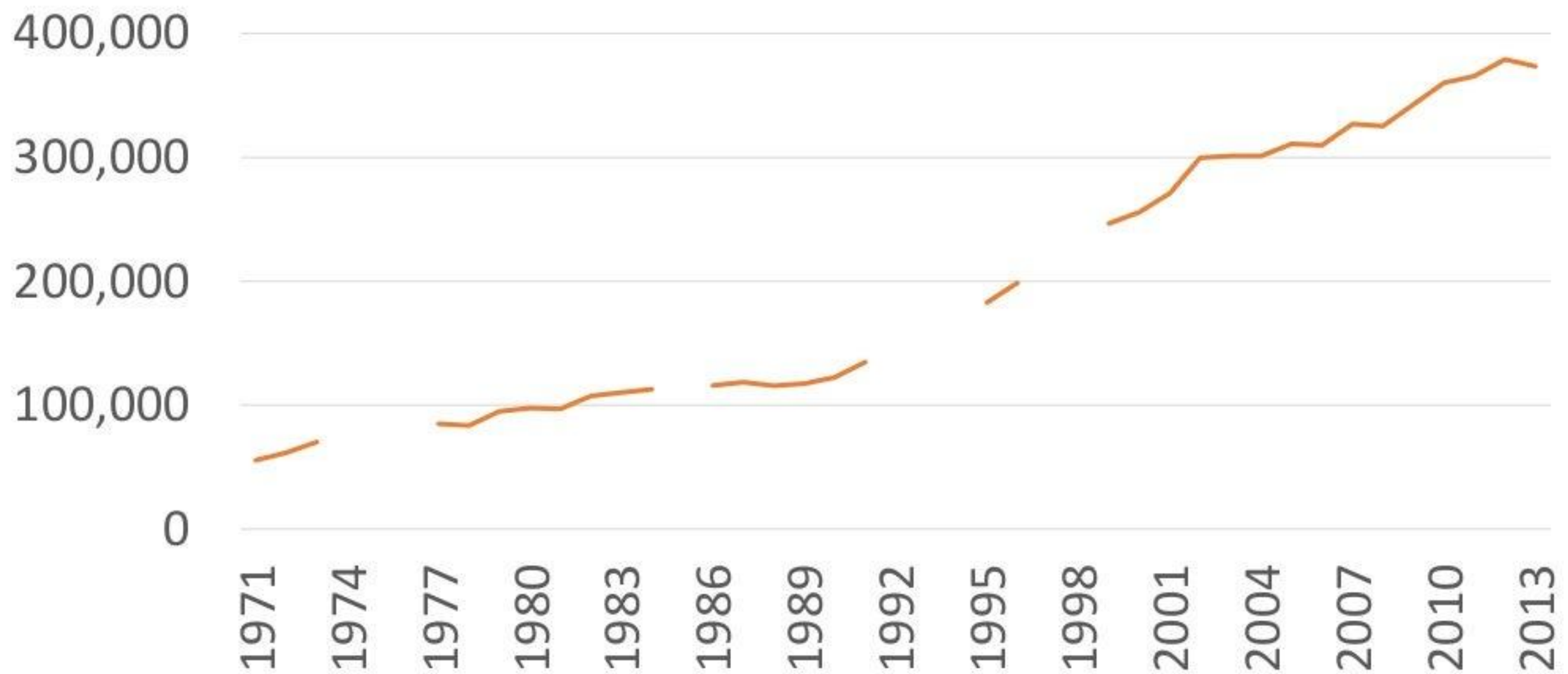


# Increased level of education

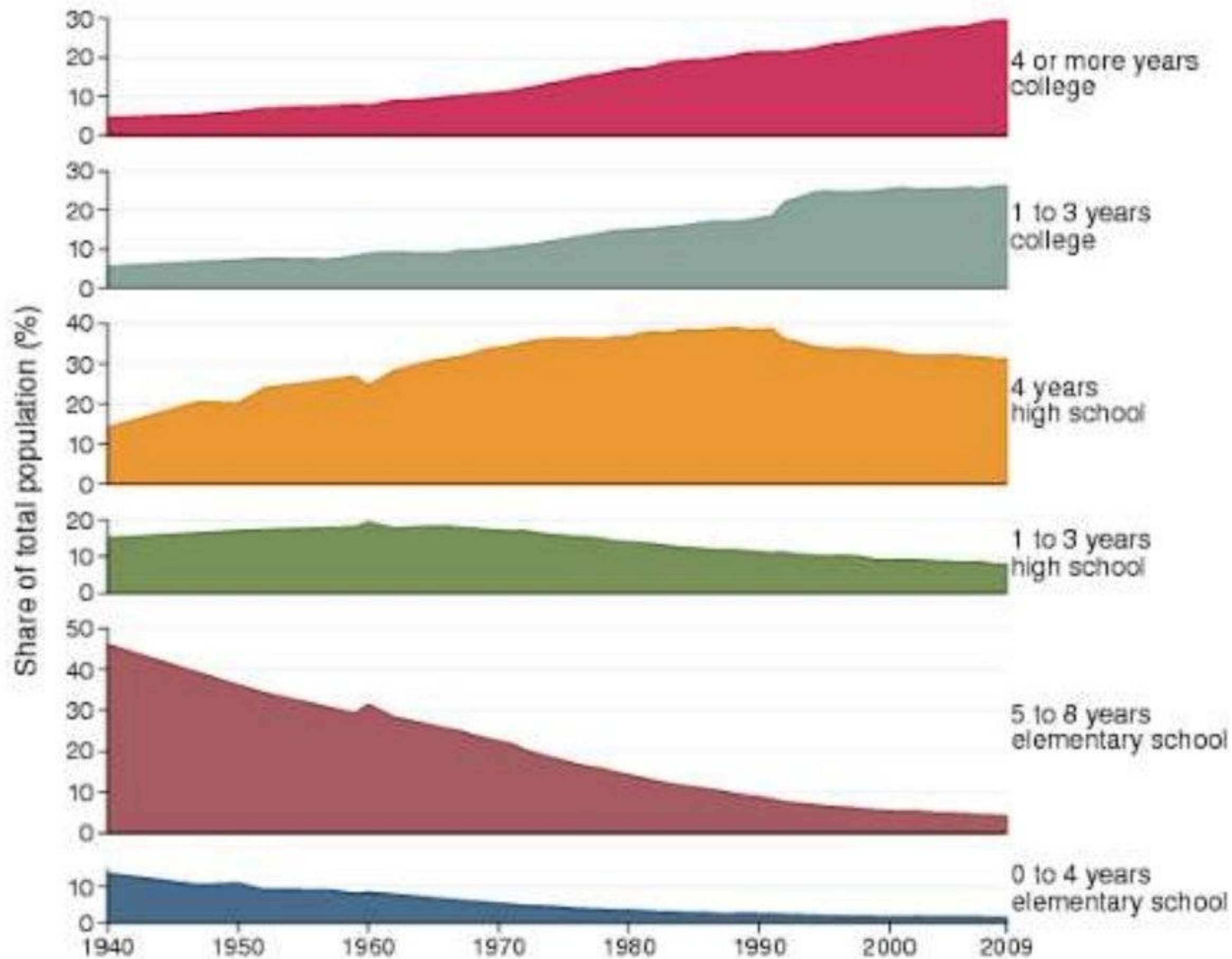
Enrolment in tertiary education, all programmes, both sexes (number)



## Israel - Students enrolled at public and private tertiary education institutions.



# Years of school completed by population 25+ years 1940-2009

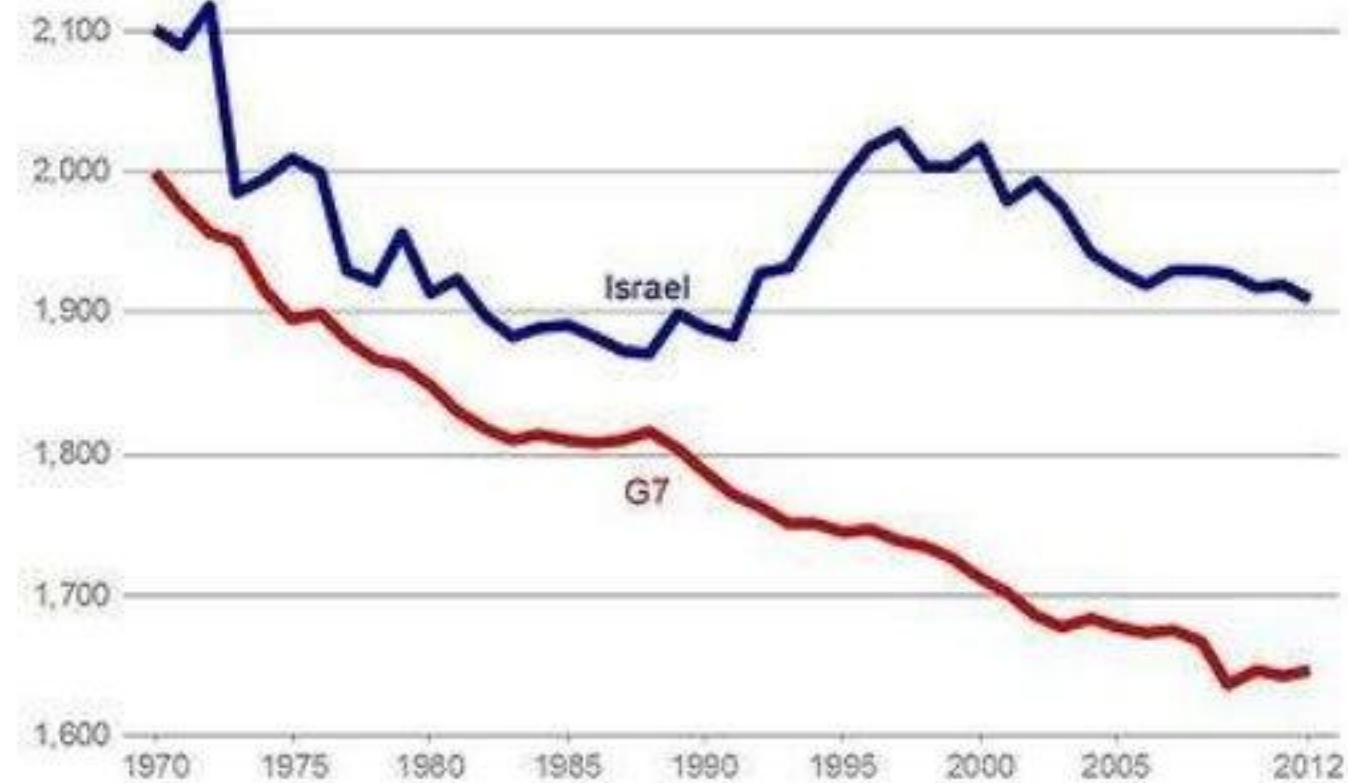




# Leisure

Figure 1

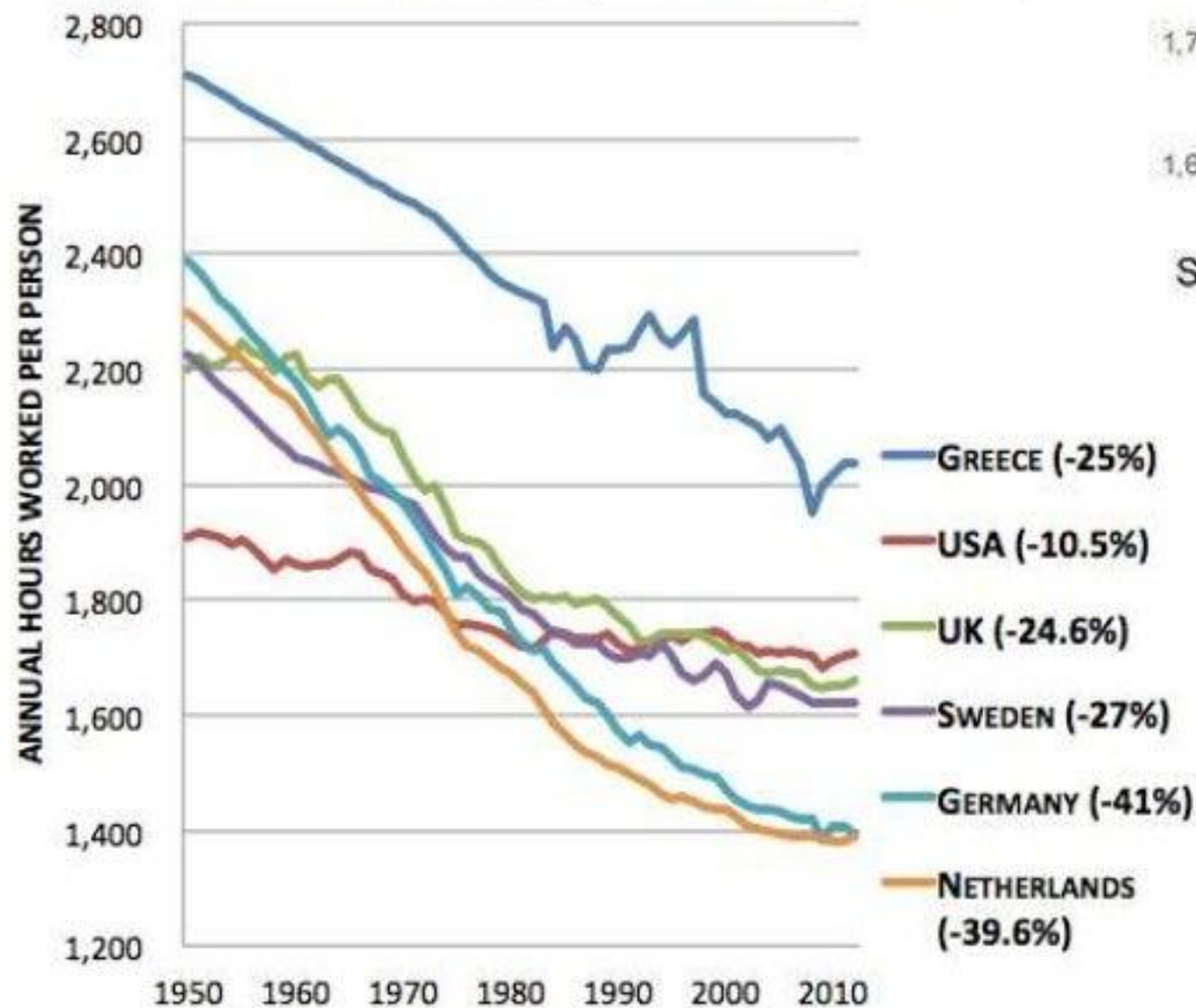
Average annual hours actually worked per person  
1970-2012



Source: Dan Ben-David, Taub Center and Tel Aviv University

## WHO WORKS THE MOST?

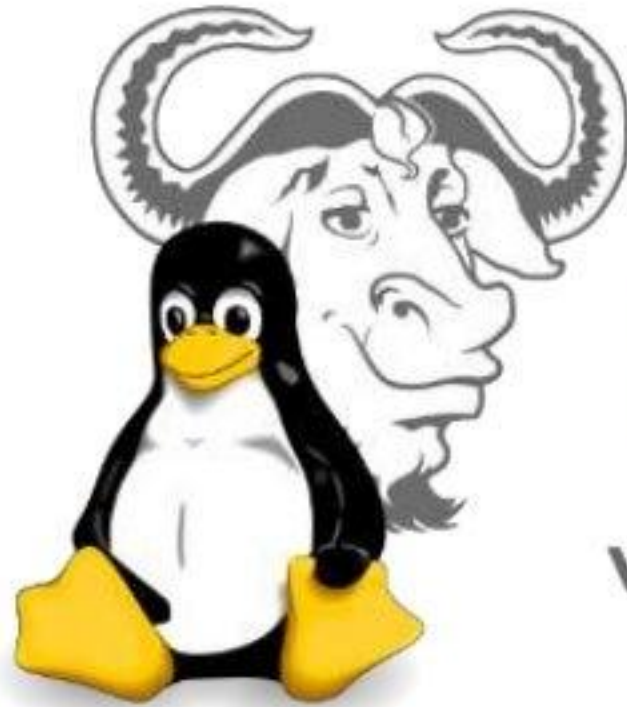
Hours worked by country (60-year decline in paratheticals)



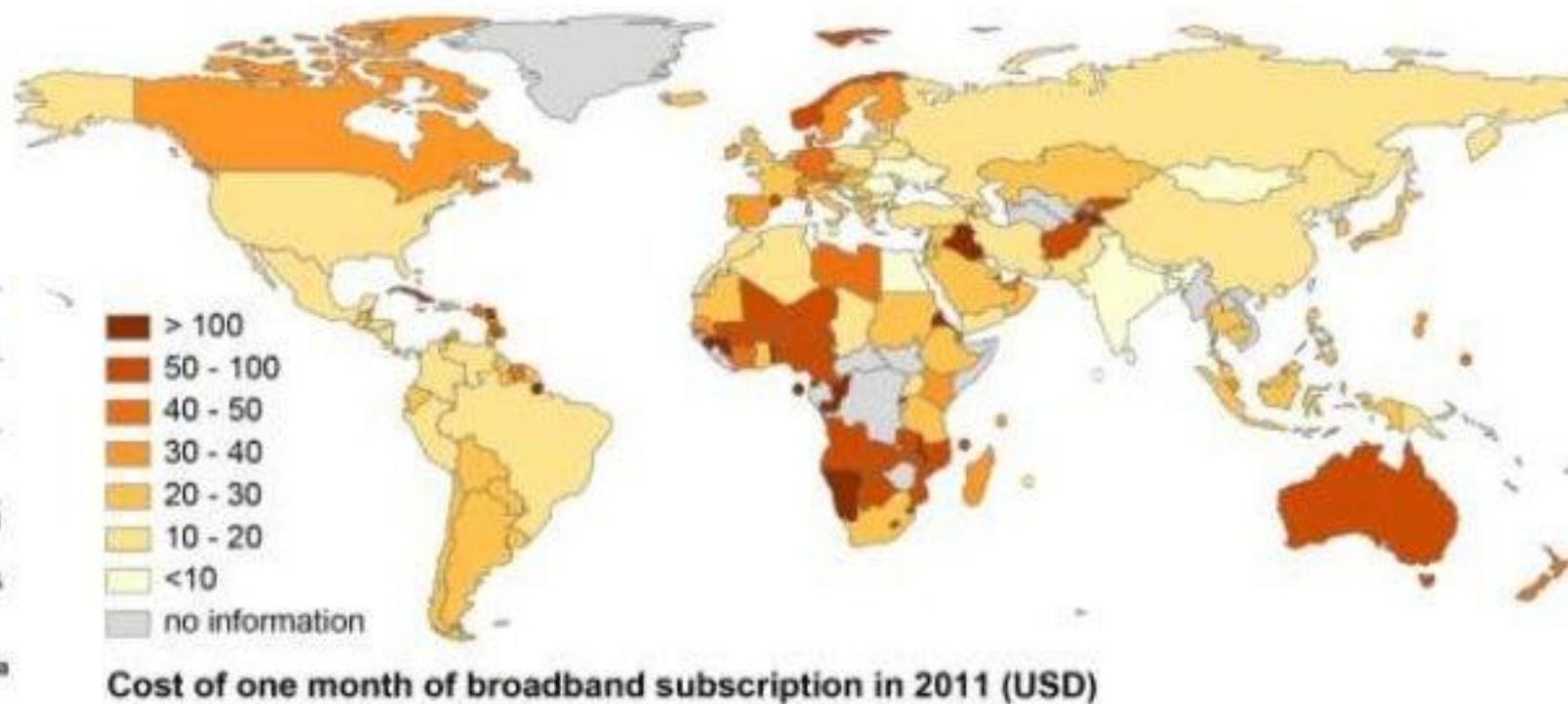
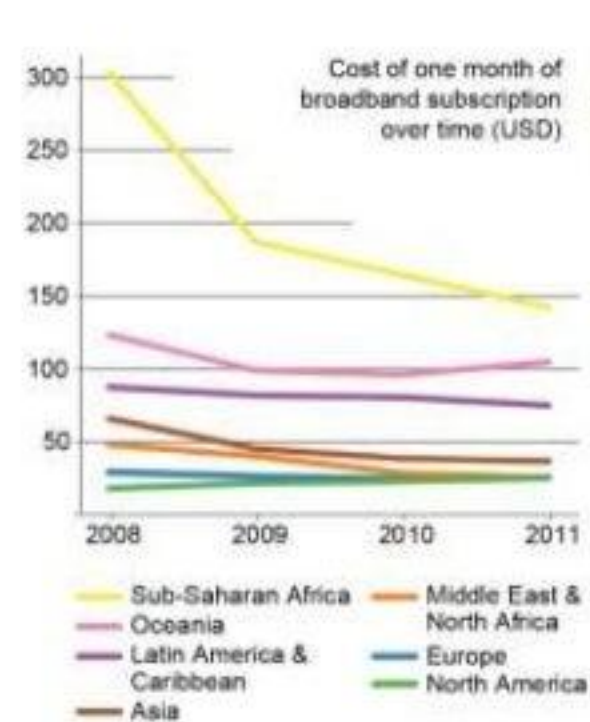
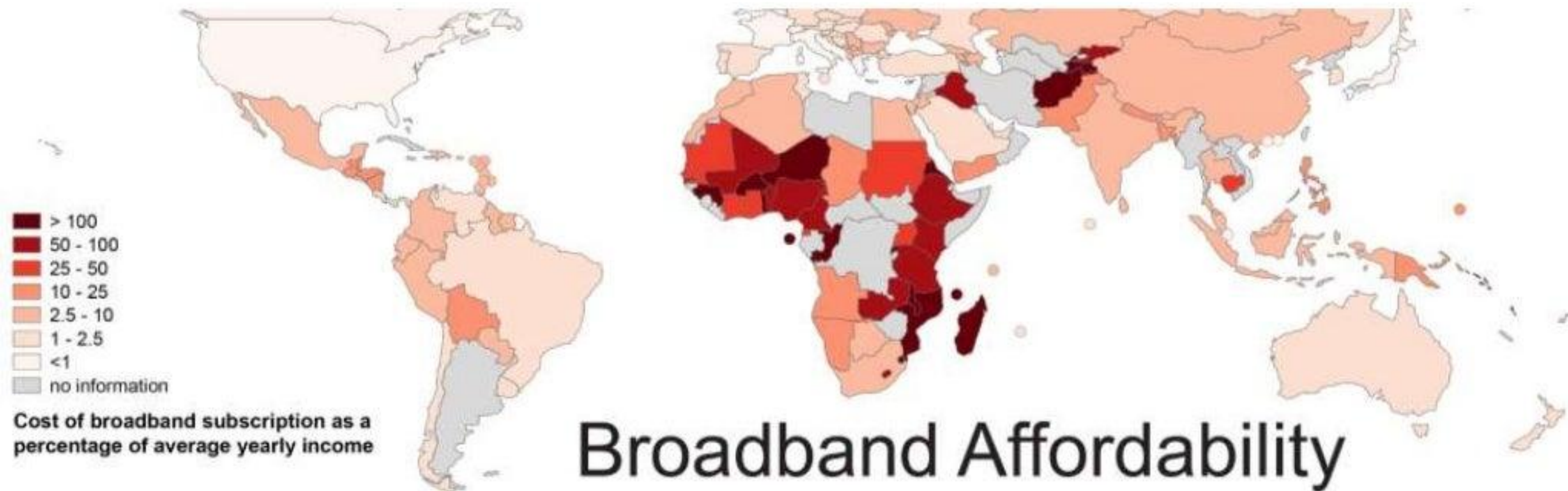
Source: the Atlantic

# Sharing economies

- In many areas, especially in production and sharing of information





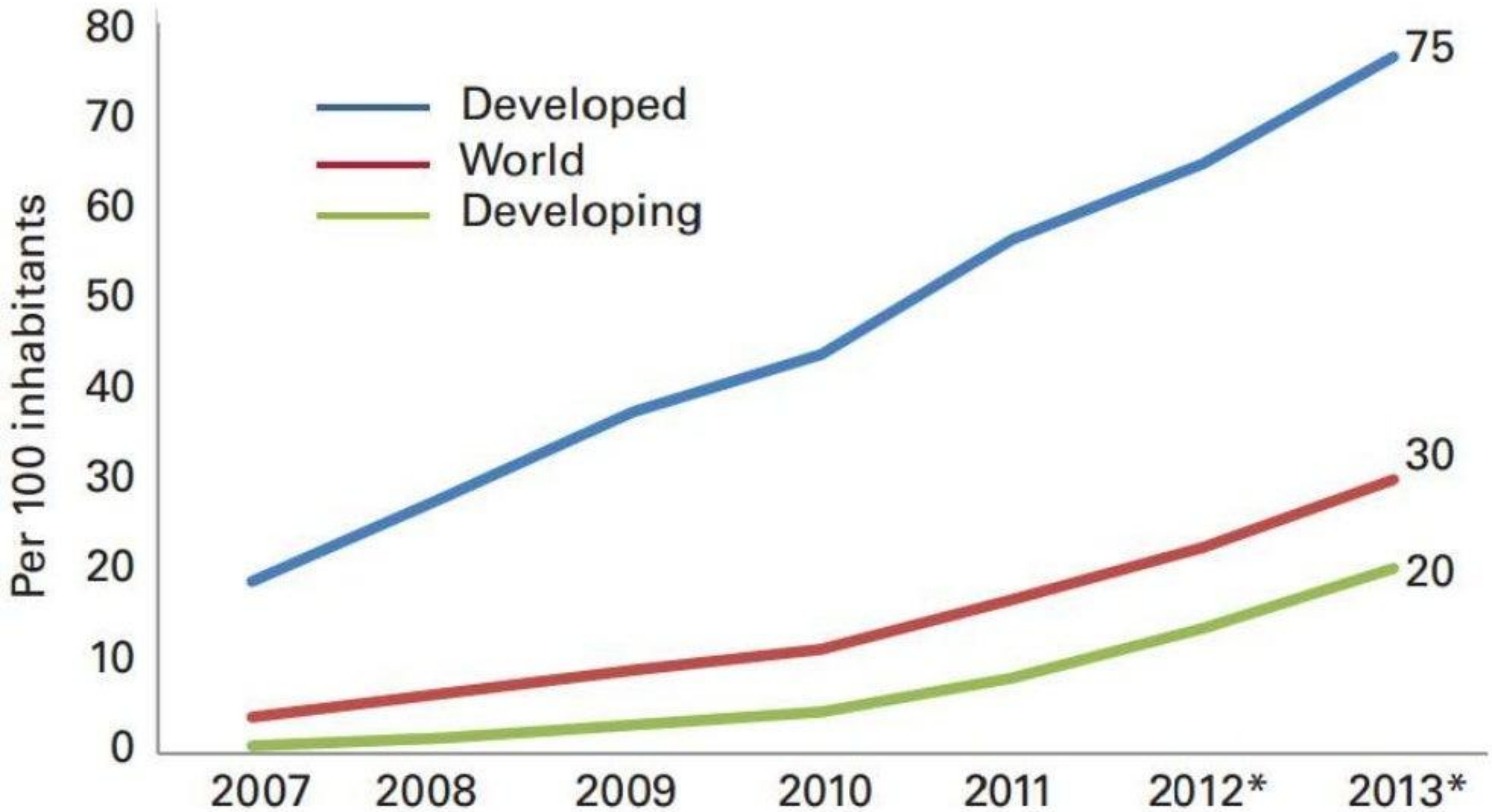


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Internet Geographies at  
the Oxford Internet Institute  
2014  
[geography.oii.ox.ac.uk](http://geography.oii.ox.ac.uk)

data sources:  
ITU • [itu.int](http://itu.int)  
World Bank • [data.worldbank.org](http://data.worldbank.org)

# Active mobile-broadband subscriptions, 2007-2013\*



Source: ITU World Telecommunication /ICT Indicators database

Note: \* Estimate