

# Mortality, Health and the Economy: a long run perspective

Lionel Kesztenbaum (INED and PSE)

[lionel.kesztenbaum@ined.fr](mailto:lionel.kesztenbaum@ined.fr)

<https://lionel-kesztenbaum.site.ined.fr/>

Advanced Economic History

Session 4

06/10/2025

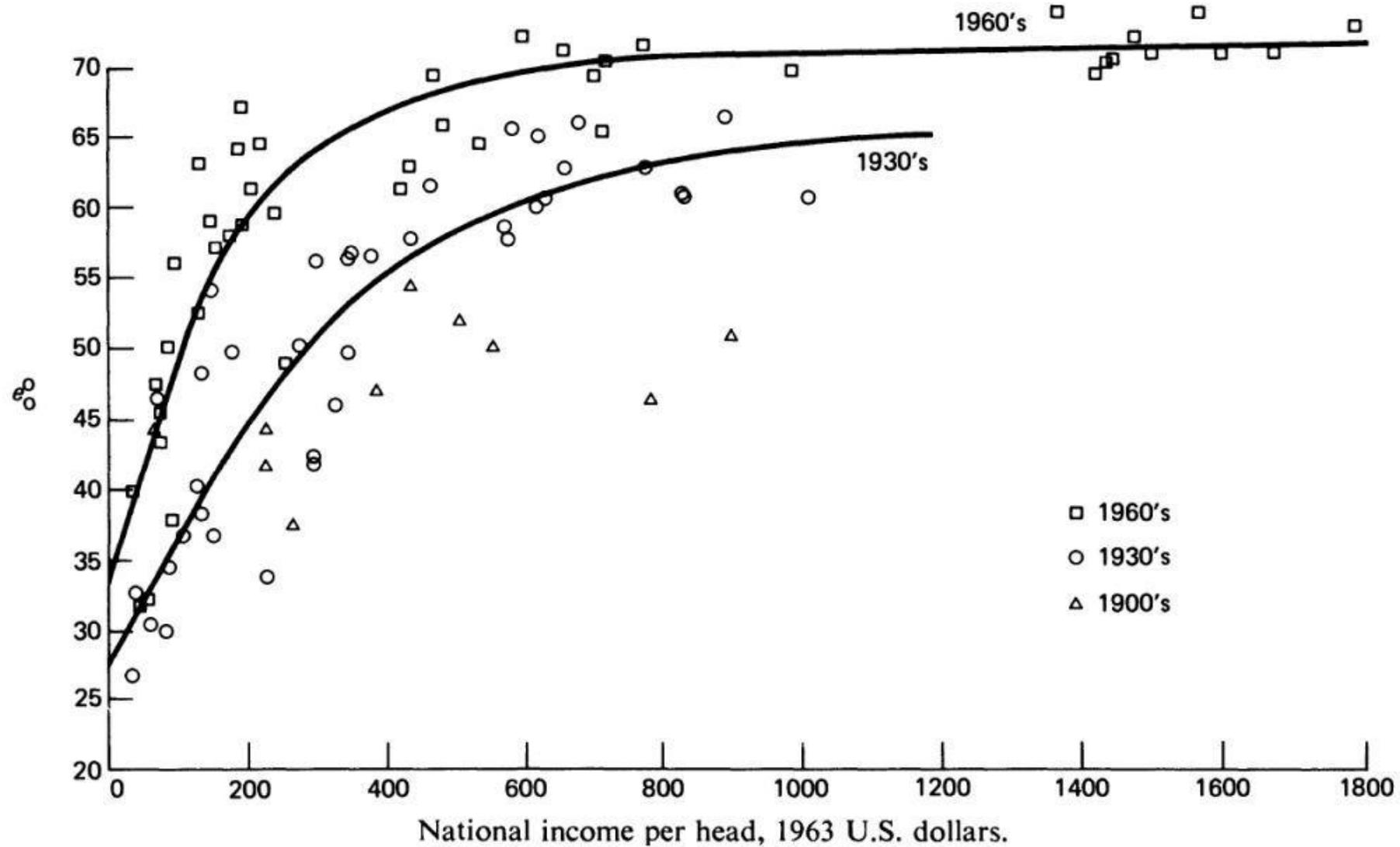
## General settings (1) The great transformation of human life

- The democratization of a long life
  - Life expectancy (at birth) from c. 30 years in 1800 to 67.5 in 2000 [72.6 in 2019].
  - Share surviving to adulthood (20 y.o.), from c. 50% to 90% [95%].
  - Share surviving to old age (65 y.o.), from c. 15% to 70% [75%].
- Improvements in both average and distribution (variance).
- And it is more than just mortality/survival
  - Change in diseases structure: away from infectious diseases.
  - Change in relation to diseases: sickness, morbidity, and health.
  - Change in the ways societies confront to disease: from lazaret to modern hospital.
  - Physical capacity: size and shape of the body.

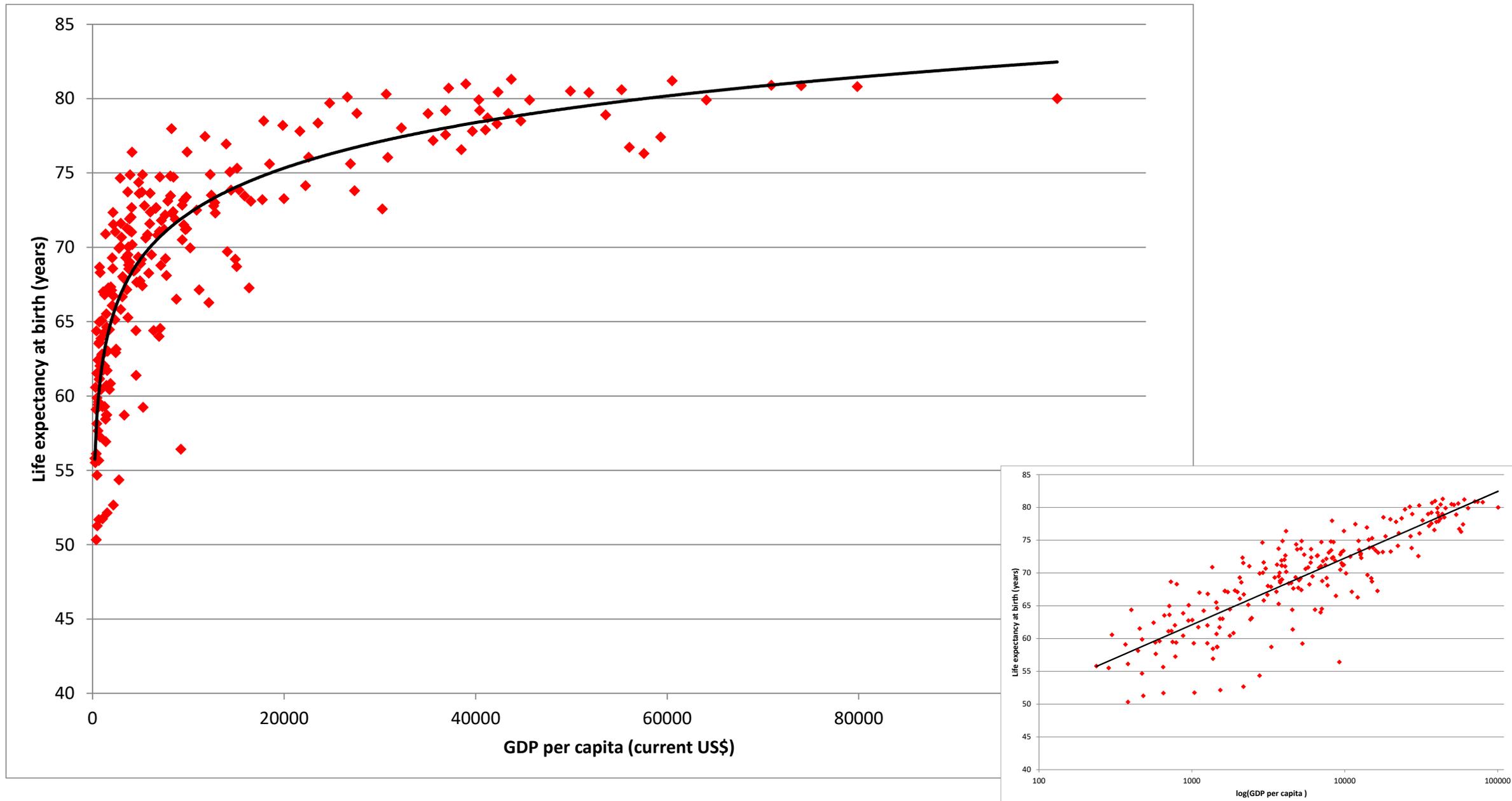
## General settings (2) income and mortality

- Do economic growth reduce mortality?
  - Income produce health.
  - But direct causation difficult to assess.
  - Lack of empirical evidences.
- A more complex pattern
  - Both direct and indirect effects.
  - Combination of public and private health.
  - Long term effects (early life hypothesis, foetal hypothesis, etc.).
- Overall, huge historical changes in mortality not (Directly? Entirely?) linked to increase of income.

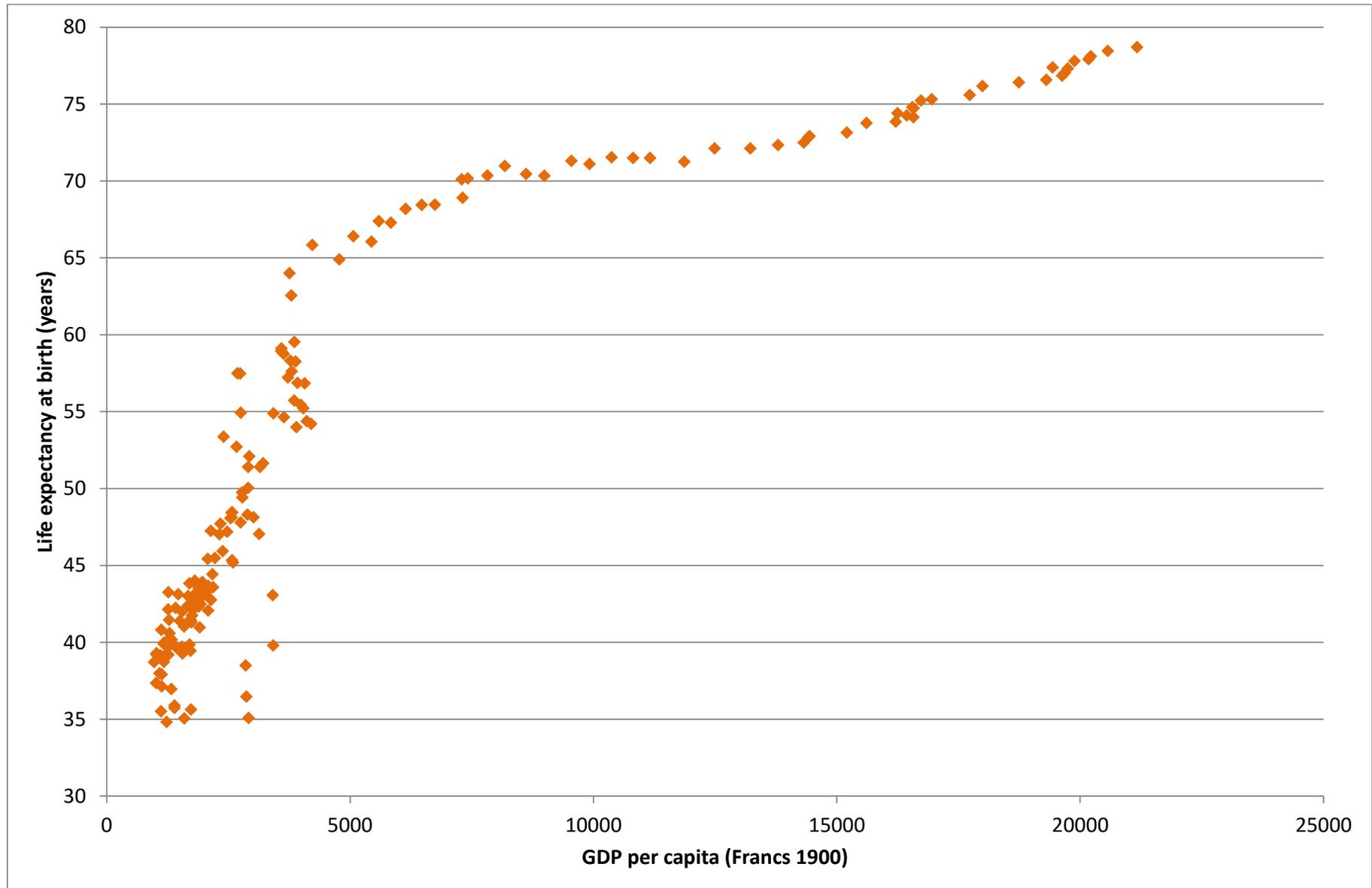
# The « Preston curve »



# The Preston curve: 2016



# The Preston curve: France, 1820-2000



## General settings (2) income and mortality

- Do economic growth reduce mortality?
  - Income produce health.
  - But direct causation difficult to assess.
  - Lack of empirical evidences.
- A more complex pattern
  - Both direct and indirect effects.
  - Combination of public and private health.
  - Long term effects (early life hypothesis, foetal hypothesis, etc.).
- Overall, huge historical changes in mortality not (Directly? Entirely?) linked to increase of income.

## General settings (3) health and income

- Do reduction in mortality produce economic growth?
  - The capacity to work is limited by health status.
  - Better food produces healthier individuals.
  - Better health produces income.
- Physical capital
  - Size and shape of the body matter...
  - ...and change also over time.
- Mortality is not the only thing that matters, health is also important.
- In the long run virtuous circle ?

# General settings (4) Pathogens, environment and economic growth

“Atahualpa's presence at Cajamarca thus highlights one of the key factors in world history: diseases transmitted to peoples lacking immunity by invading peoples with considerable immunity. Smallpox, measles, influenza, typhus, bubonic plague, and other infectious diseases endemic in Europe played a decisive role in European conquests, by decimating many peoples on other continents.” (Jared Diamond, 1997: 77).

- What role for diseases in human history?
  - The rise and fall of the Roman Empire: Kyle Harper's *The Fate of Rome*. 2017 vs Haldon et al. *History Compass*. 2018.
  - From the Antonine plague 2<sup>nd</sup> century CE to the Justinian plague (early 540s).
  - From the Roman Climatic Optimum to the Late Antique Little Ice Age (LALIA).
- The depopulation of the Americas: smallpox vs conquistadors
  - Diseases and the eradication of Indians: Dobyns, "Disease transfer at contact." *Annual Review of Anthropology* (1993).
  - The ideology behind the germs: Livi-Bacci, Massimo. "The depopulation of Hispanic America after the conquest." *PDR*. 2006.
- A complex combination of social, environmental, and biological factors
  - Rise (and fall) of specific diseases is related to social organization (in a very broad sense).
  - Reaction to disease modify social order in many ways, in the short-, medium, and long-term.

## General settings (5) inequalities in mortality and health

- How does inequality evolve during the health transition?
  - Decrease in overall mortality may combine with stable (or even increasing) inequalities.
  - Historically both a strong wealth gradient and a strong urban penalty.
  - Mortality inequalities are still (very) high today (both within and between countries).
- Investigating the mortality transition
  - The evolution of inequalities may depend on the factors underlying the mortality transition.
  - Long term effects.
- Not only economic inequalities
  - Gender, education, etc. also matter.
  - And all evolve differently over the course of the health transition.

# Outline

- The health transition: an overview.
- Explaining the mortality decline.
- Inequalities in mortality and their evolutions.
- Height and anthropometric indicators.
- Early life effects.

# The health transition



## BOROUGH OF LUDLOW. INFECTIOUS DISORDERS, SMALL-POX,

Ac.  
The attention of the Public is particularly directed to the following sections of the "Public Health Act, 1875," which will be strictly enforced in this Borough :—

### ANY PERSON WHO,

1. While suffering from any dangerous infectious disorder, wilfully exposes himself without proper precautions against spreading the said disorder, in any Street, Public Place, Shop, Inn, or Public Convenience, or enters any Public Convenience without previously notifying to the Officer, Constable or Driver thereof that he is so suffering ; or

2. Being in charge of any Person so suffering, so exposes such sufferer ; or

3. Gives, lends, sells, transmits, or exposes without previous disinfection, any Bedding, Clothing, Bags, or other things which have been exposed to infection from any such disorder, shall be liable to a **Penalty** not exceeding **Five Pounds**.  
And a Person who, while suffering from any such disorder, enters any Public Convenience without previously notifying to the Officer or Driver that he is so suffering, shall in addition be ordered by the Court to pay such Officer and Driver the amount of any loss and expense they may incur in carrying into effect the provisions of this Act, with respect to disinfection of the Convenience, provided that no proceedings under this section shall be taken against Persons transmitting with proper precautions any Bedding, Clothing, Bags, or other things for the purpose of having the same distributed.

Sec 100 Every Officer or Driver of a Public Convenience shall immediately provide for the disinfection of such Convenience after it has to his knowledge conveyed any Person suffering from a dangerous infectious disorder.

And if he fails to do so, he shall be liable to a **Penalty** not exceeding **Five Pounds**.  
But no such Officer or Driver shall be required to convey any Person so suffering, until he has been paid a sum sufficient to cover any loss or expense incurred by him in carrying into effect the provisions of this section.

Sec 101 Any Person who knowingly lets for hire any House, Room, or part of a House in which any Person has been suffering from any dangerous infectious disorder, without having such House, Room, or part of a House, and all articles therein liable to retain infection, disinfectant to the satisfaction of a legally qualified Medical Practitioner as testified by a certificate signed by him, shall be liable to a **Penalty** not exceeding **Twenty Pounds**. For the purpose of this section the keeper of an Inn shall be deemed to let for hire part of a House to any Person admitted as a guest into such Inn.

Sec 102 Any Person letting for hire or drawing for the purpose of letting for hire, any House, or part of a House, who, on being questioned by any Person inspecting for the hire of such House, or part of a House as to the fact of there being, or within the Week previously having been therein any Person suffering from any dangerous infectious disorder, knowingly makes a false answer to such question, shall be liable at the discretion of the Court to a **Penalty** not exceeding **Twenty Pounds**, or to **Imprisonment** without hard labour for a period not exceeding **One Month**.

PUBLISHED BY ORDER OF THE SANITARY COMMITTEE.

**JOHN WILLIAMS,**  
TOWN CLERK.

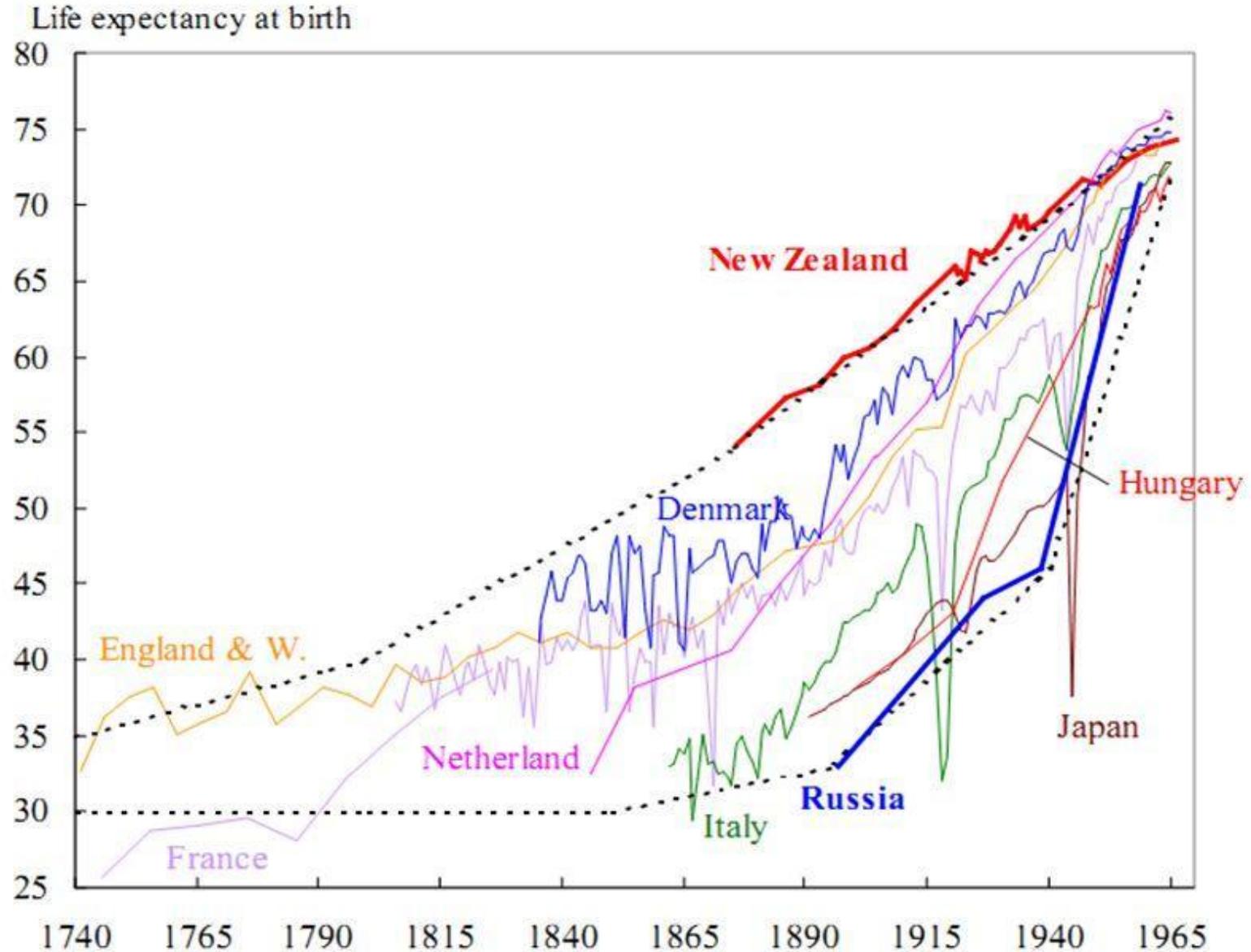
Printed at the Office, Guildhall, Ludlow,  
January 30, 1877.

A. JAMES & SONS, PRINTERS, 10, BRIDGE STREET, LONDON.

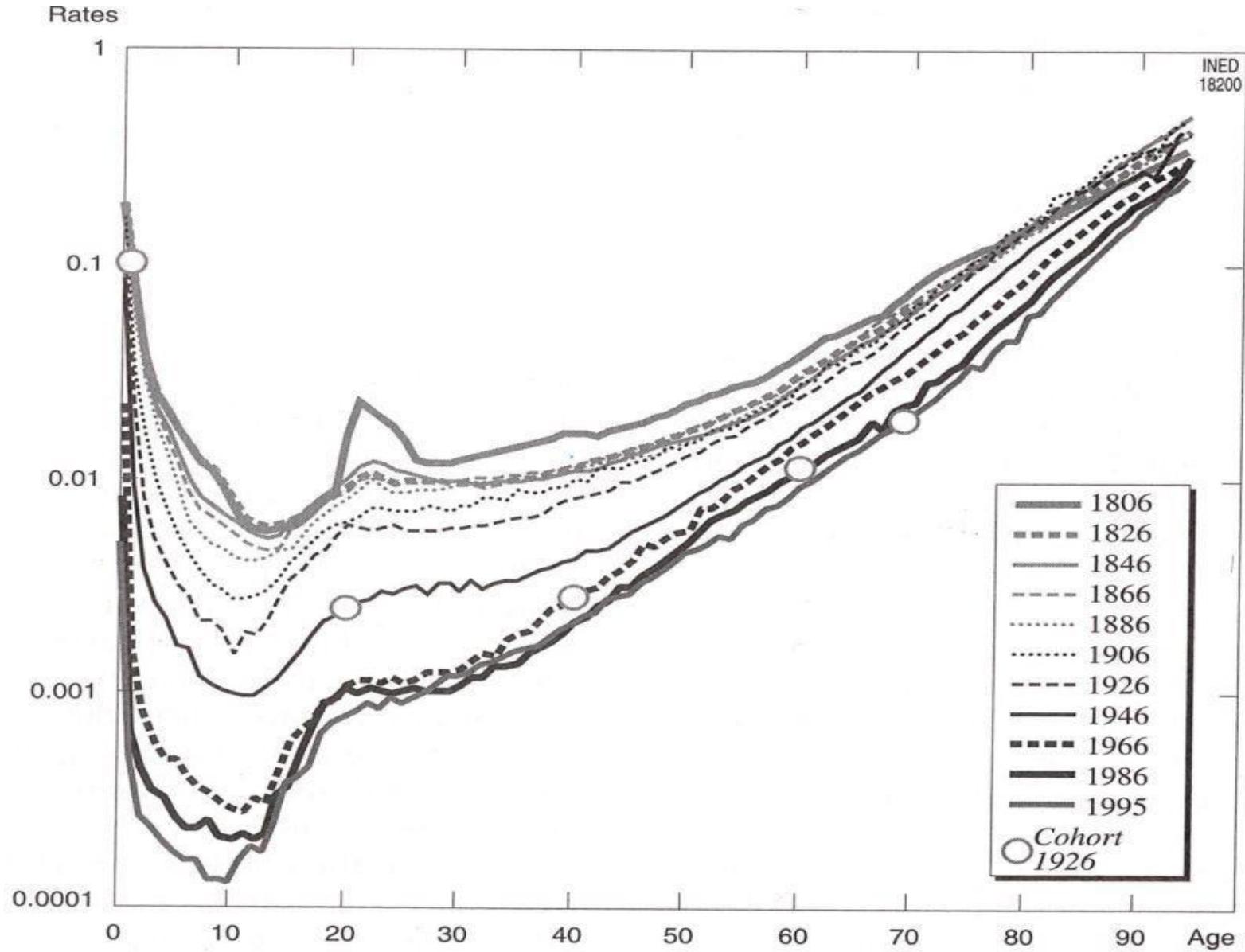
# The epidemiological transition (Omran, 1971)

- ❑ Omran (1971) “The Epidemiologic Transition: A Theory of the Epidemiology of Population Change”. *The Milbank Memorial Fund Quarterly* 49 (4): 509 38.
- ❑ Three ages through which humanities went (goes)
  - ▲ The Age of Pestilence and Famine
  - ▲ The Age of Receding Pandemics
  - ▲ The Age of Degenerative and Man-Made Diseases
- ❑ Appropriation of the length of life by mankind.

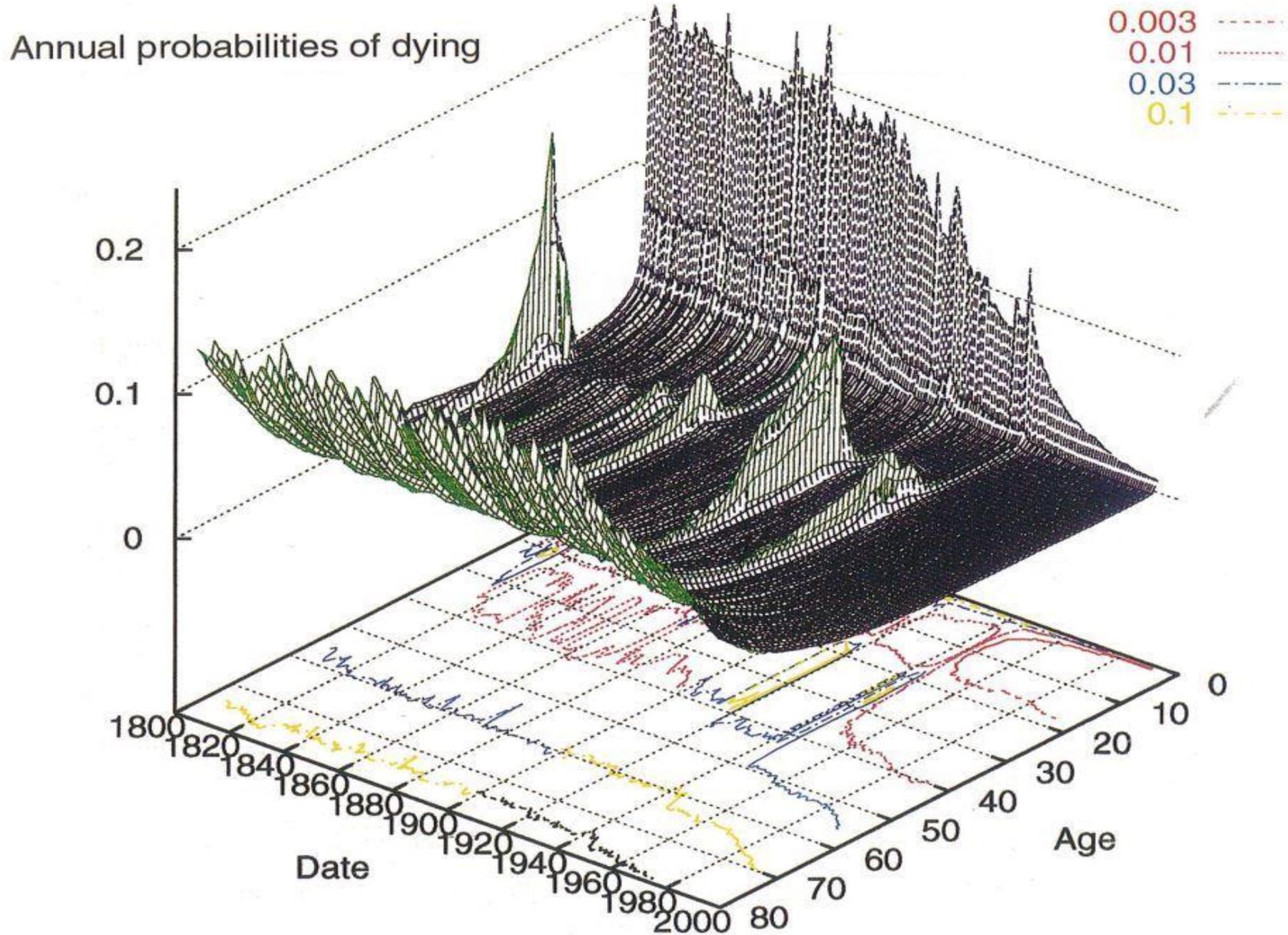
# The epidemiologic transition: a (developed) world view



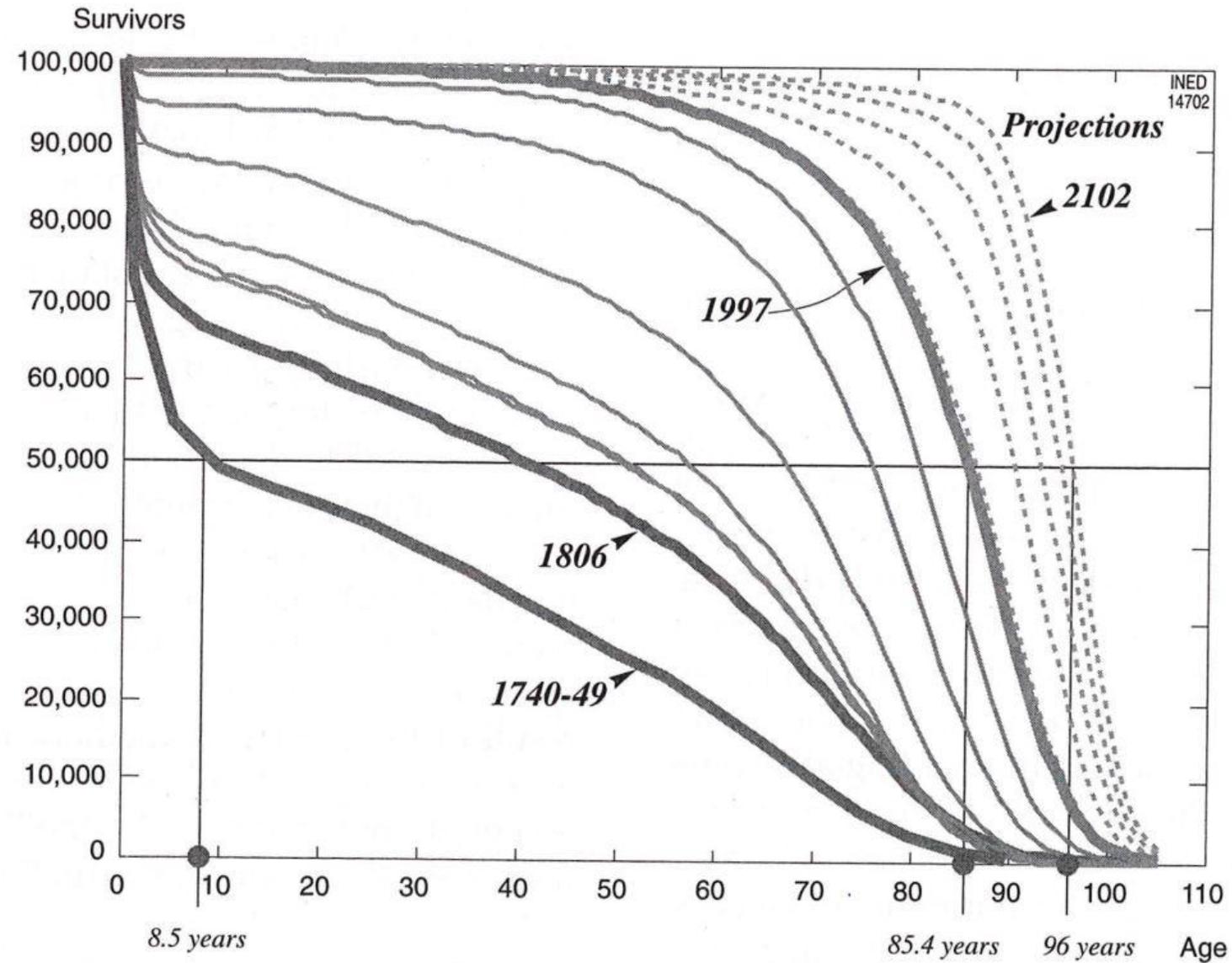
# Rates of death by age, France 1806-1995



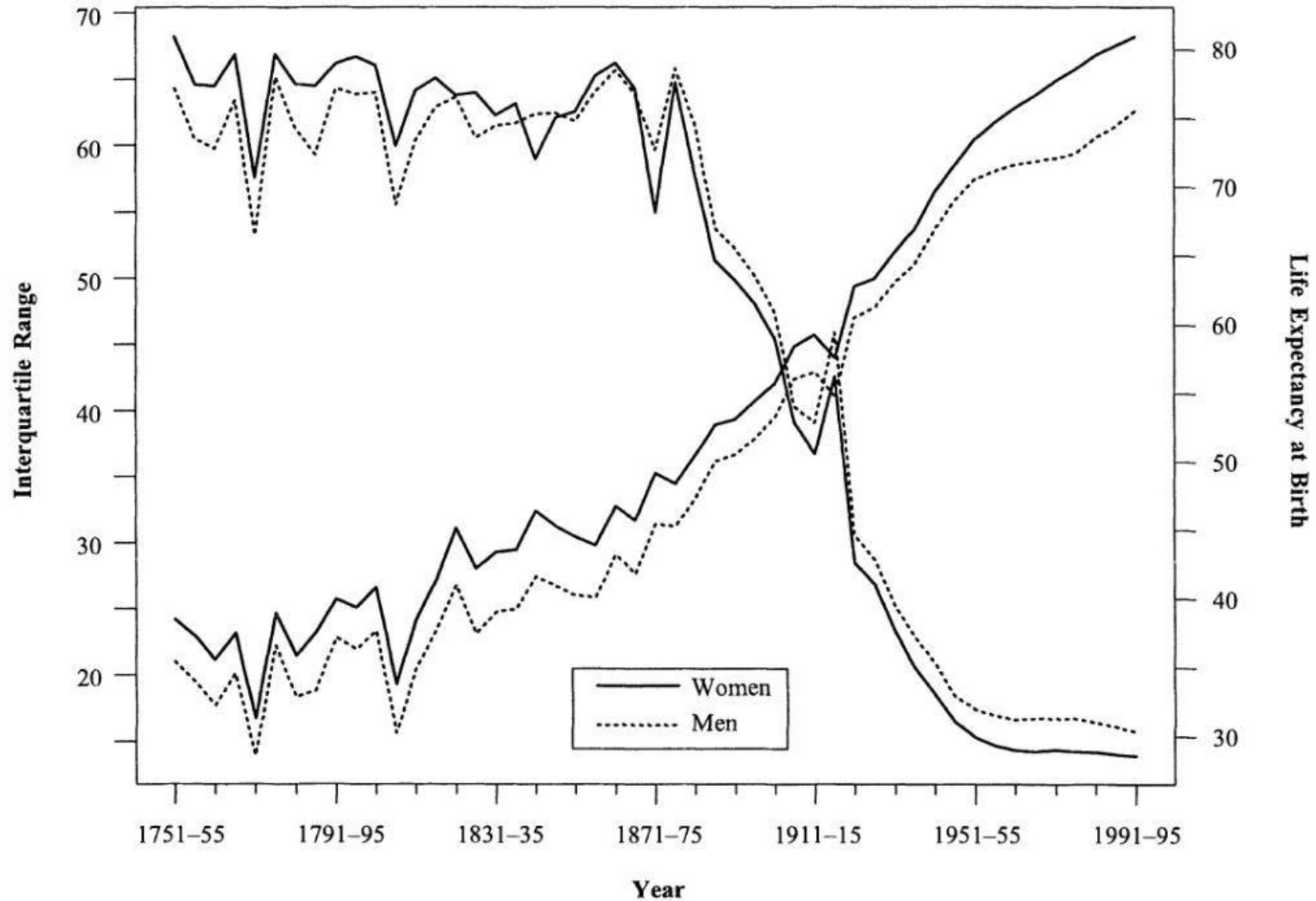
# Annual probability of death French male 1806-1995



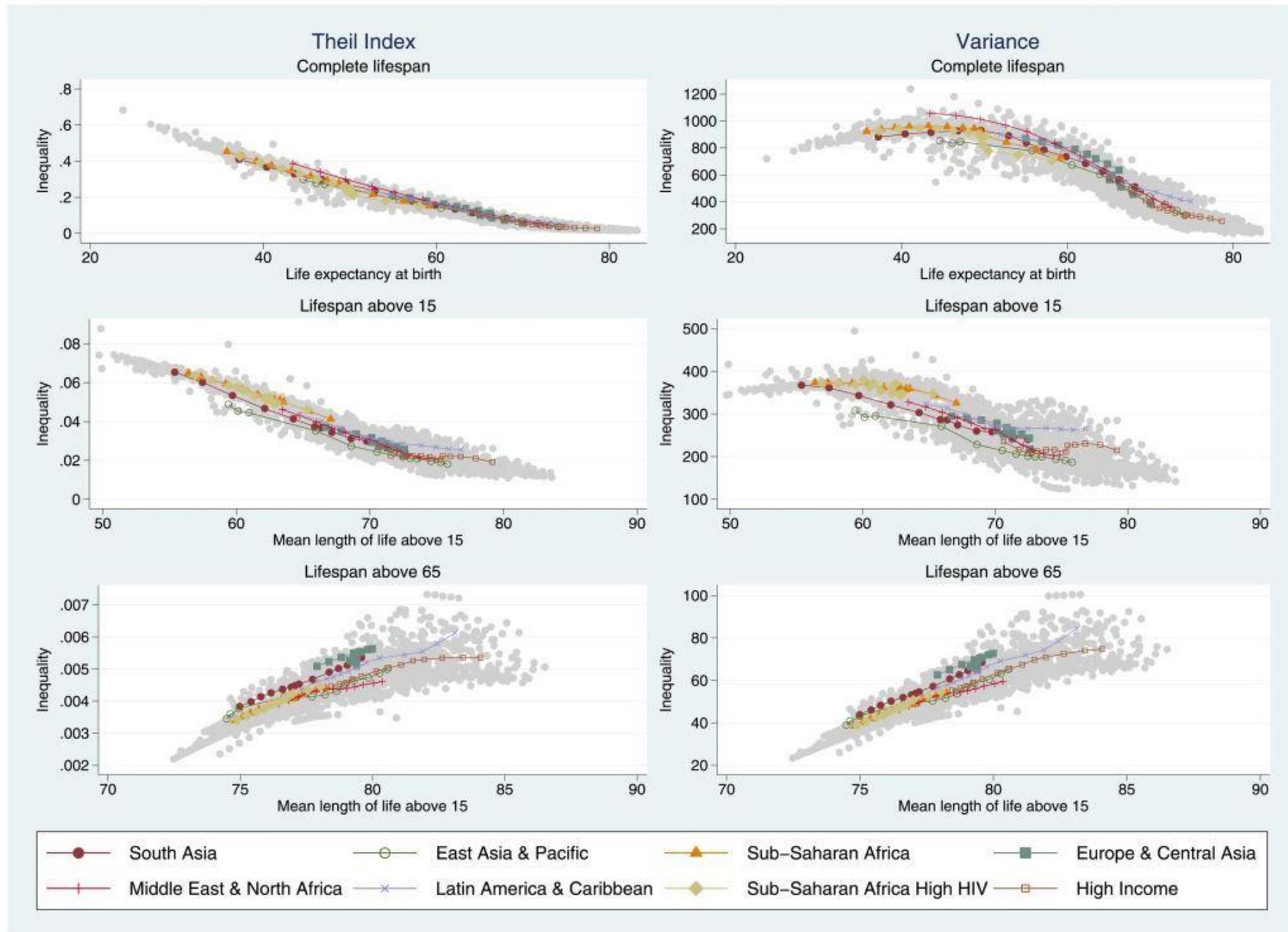
# Survival curves, France 1740-1997



# Longevity and lifespan inequality during the health transition



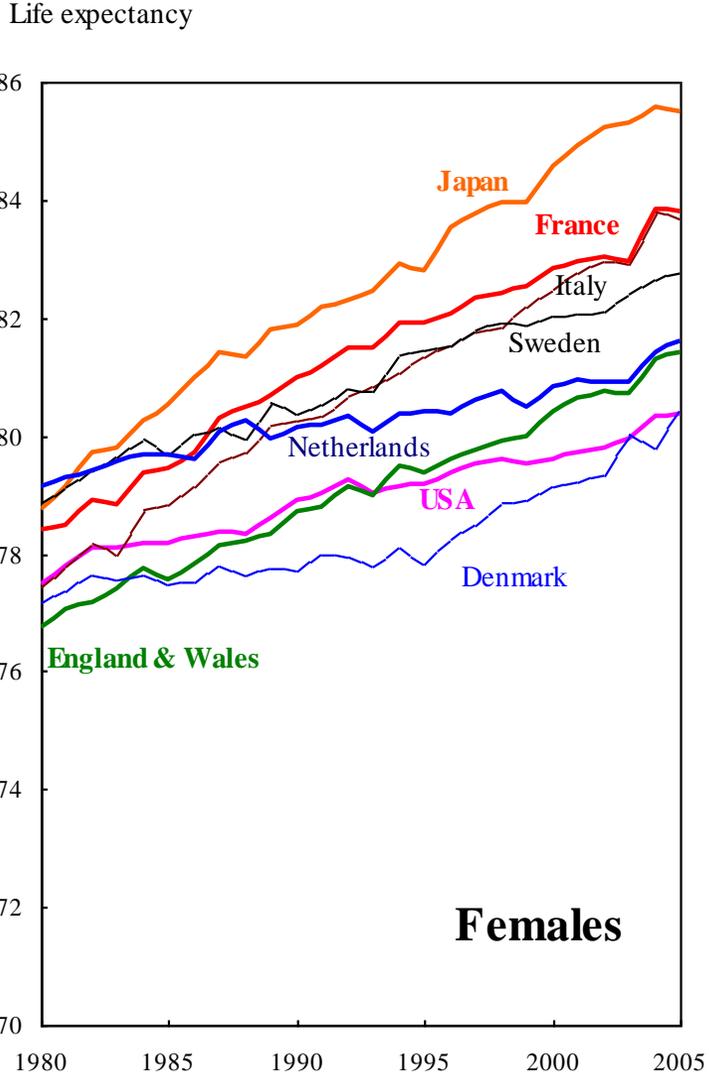
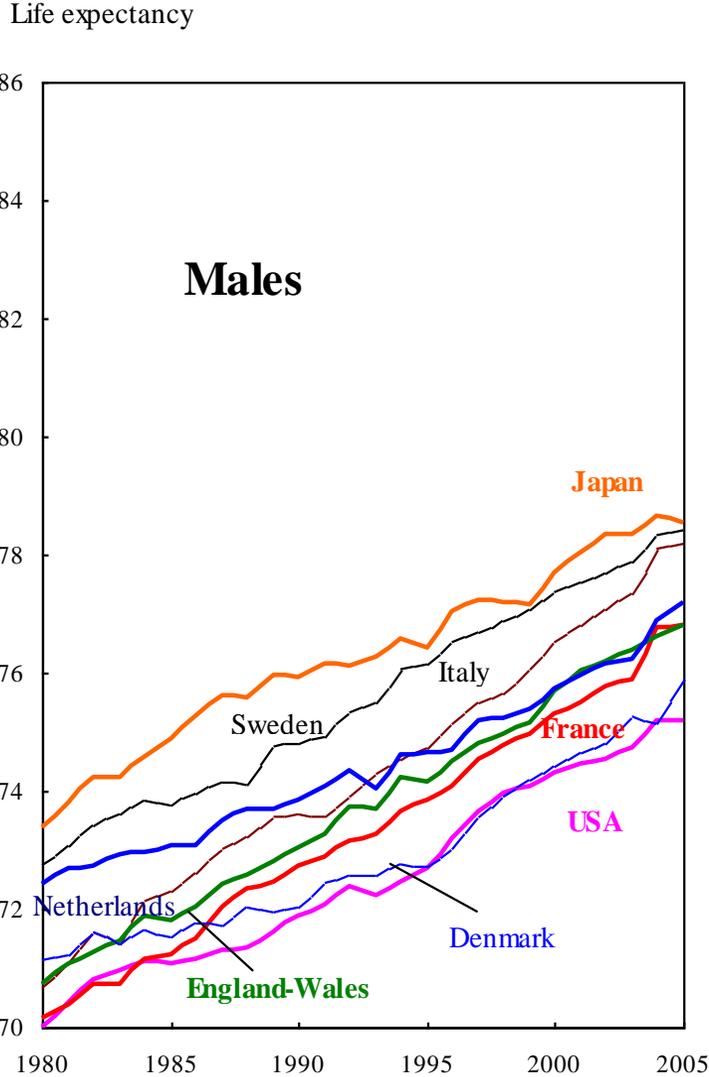
# Longevity and lifespan inequality (1950-2015)



## And after the transition?

- ❑ « The cardiovascular revolution ».
- ❑ « The age of delayed degenerative diseases » (Jay Olshansky and Brian Ault, 1986).
- ❑ « The hybristic stage (individual behaviors and life-styles) » (Richard Rogers and Robert Hackenberg, 1987).
- ❑ Mortality concentrated in old age, with cumulative effects over the life cycle.
- ❑ Stage V “The age of reemergence of infectious and parasitic diseases”, Jay Olshansky et al. (1997)
  - ▲ New pandemics: AIDS, Ebola, Covid-19...

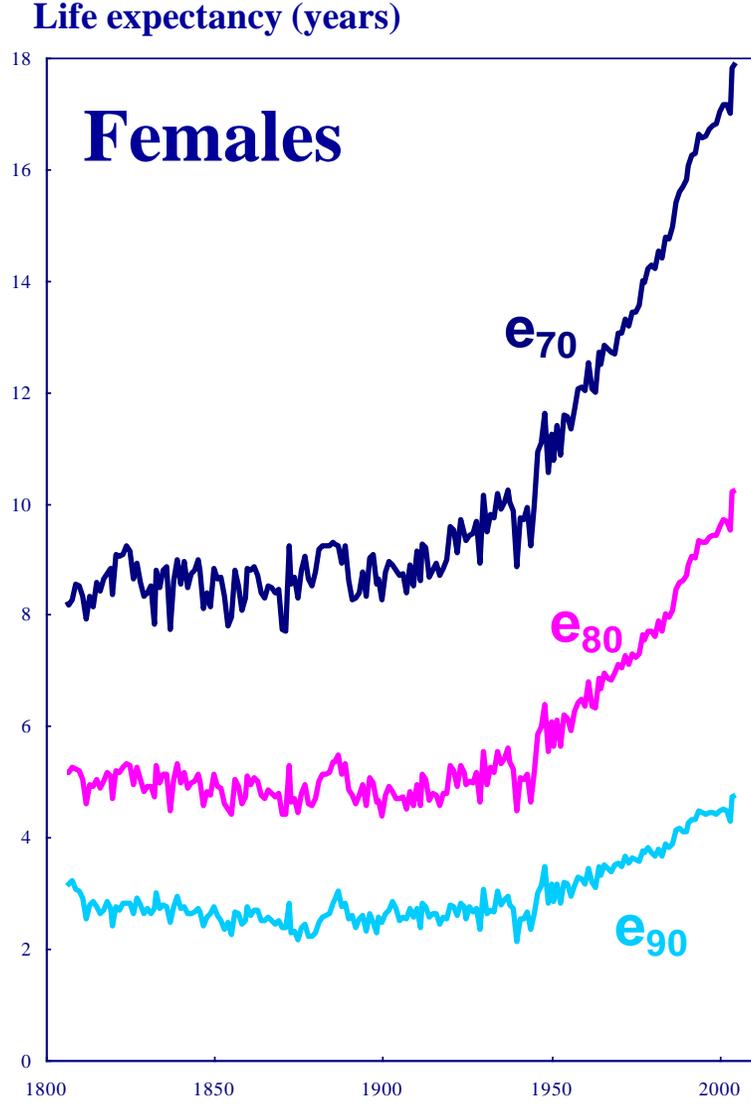
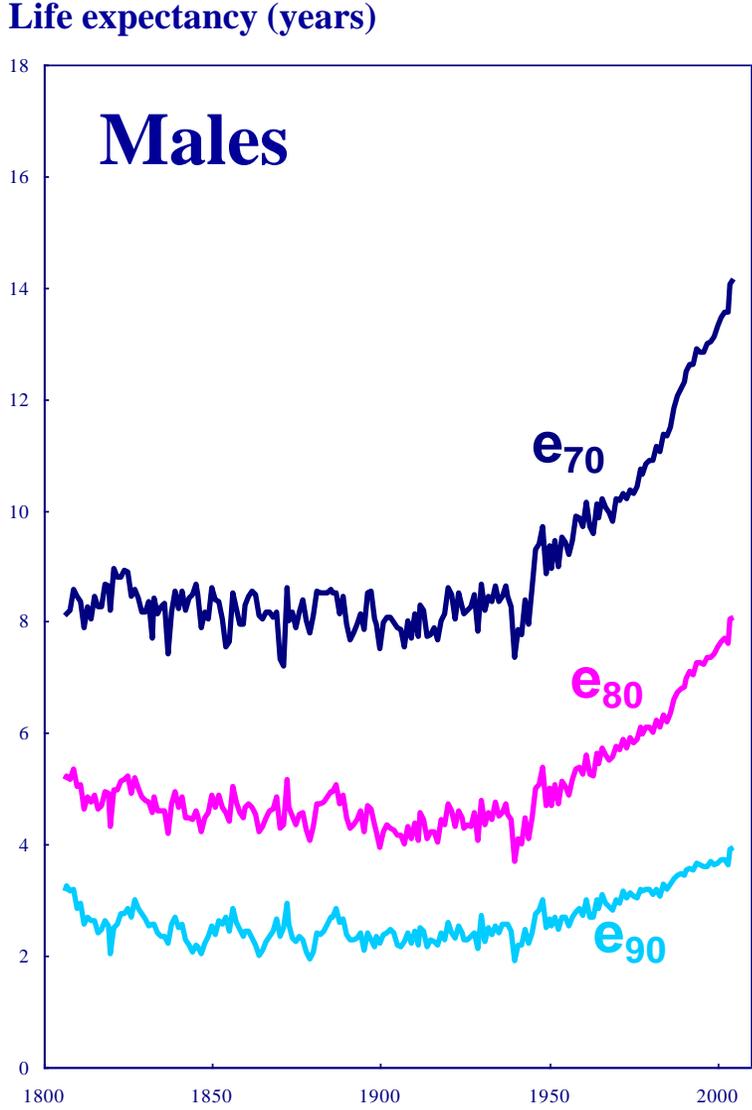
# The fourth age: fighting ageing



## And after the transition?

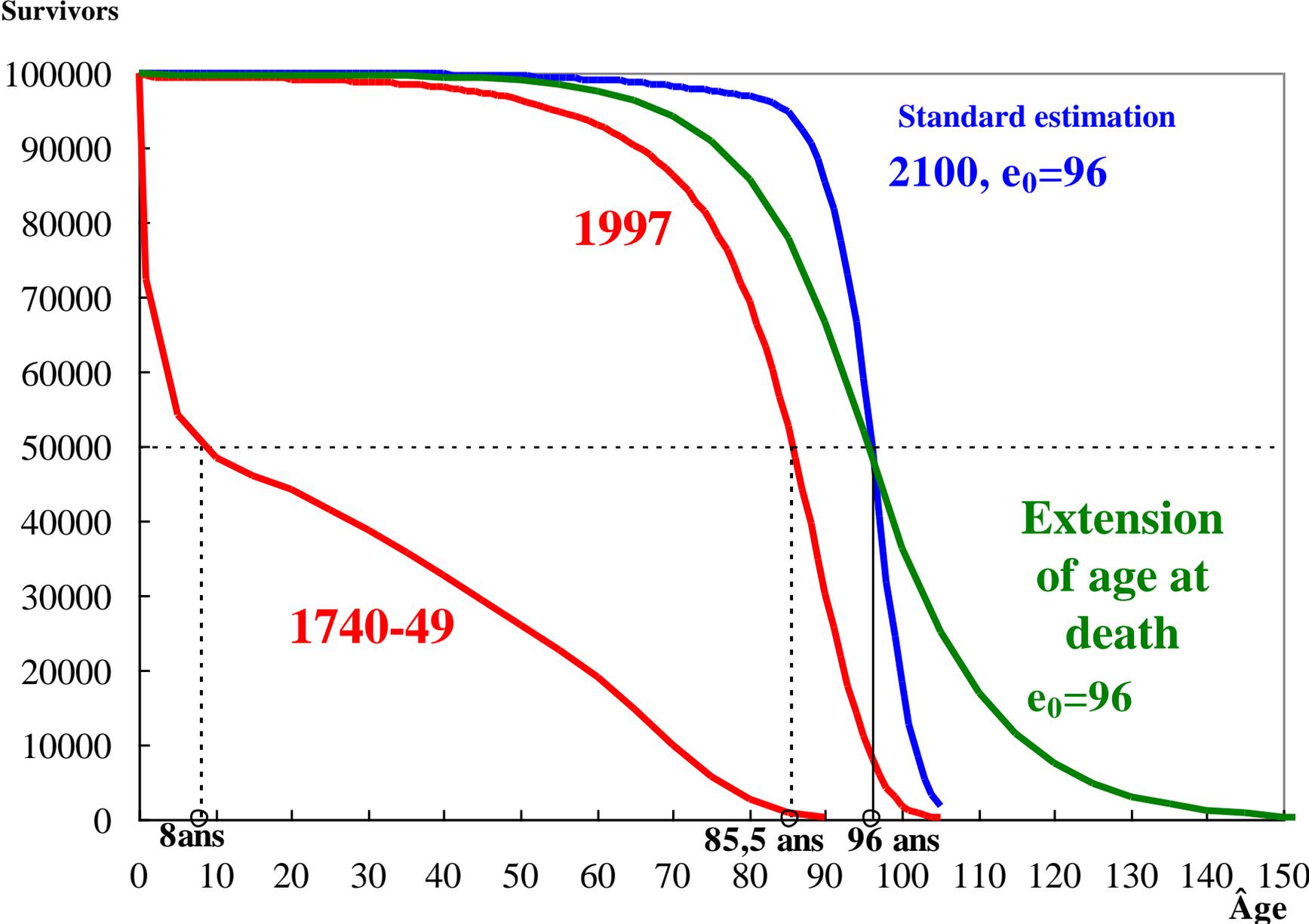
- ❑ « The cardiovascular revolution ».
- ❑ « The age of delayed degenerative diseases » (Jay Olshansky and Brian Ault, 1986).
- ❑ « The hybristic stage (individual behaviors and life-styles) » (Richard Rogers and Robert Hackenberg, 1987).
- ❑ Mortality concentrated in old age, with cumulative effects over the life cycle.
- ❑ Stage V “The age of reemergence of infectious and parasitic diseases”, Jay Olshansky et al. (1997)
  - ▲ New pandemics: AIDS, Ebola, Covid-19...

# Life expectancy at 70, 80, and 90 years old in France



Jacques Vallin and Giovanni Berlinguer. 2006. "From endogenous mortality to the maximum human life span" in Caselli, Graziella, Jacques Vallin, et Guillaume J. Wunsch. *Demography: Analysis and Synthesis. Volume 2*. Amsterdam ; Boston: Elsevier, 95-115

# Rectangularization or extension of age at death?



# The health transition in brief (1)

## □ Change in the age structure of deaths

- ▲ Reduction (and disappearance) of infant mortality.
- ▲ Very limited adult mortality.
- ▲ Old-age mortality.

## □ Change in diseases structure

- ▲ From infectious to chronic diseases.
- ▲ From high lethality to low lethality diseases.
- ▲ Reduction of the link between being sick and death.

## □ And inequalities?

- ▲ Overall strong reduction in inequality in life spans...
- ▲ ... including for adults.
- ▲ And both within and between countries.
- ▲ But at the same time, different groups benefited differently from the decline.

## The health transition in brief (2)

- ❑ Paradox 1: the demise of infectious diseases
  - ▲ Decline occurred before any cure can be found.
  - ▲ Decline survived apparition of new pathogens.
- ❑ Paradox 2: the continuing gains in life expectancy
  - ▲ Fall in life expectancy continue at older ages.
  - ▲ A kind of cumulative effects?
  - ▲ But: more recently, gains are slower, stall, and even reverse.
  - ▲ But: the picture might be different with health.
- ❑ Paradox 3: maintaining (even increasing) inequalities
  - ▲ Progress is uneven, despite better understanding of diseases.
  - ▲ Progress is uneven, despite huge development of health system.

# Explaining the mortality decline



# Explaining the mortality decline

- Change in Diseases environment
  - ❖ Plague(s), smallpox or Cholera?
  - ❖ Rise in transportation and migrations.
  - ❖ Development of cities.
- Standards of living and nutrition
  - ❖ Income and private health.
  - ❖ The nutrition channel.
- Medicine
  - ❖ Rise in medical knowledge (especially vaccination).
  - ❖ Development of medical science.
  - ❖ ...but the decline in mortality started before the big medical discoveries.
- Public health
  - ❖ *Cordons sanitaires* & beyond.
  - ❖ State intervention and large-scale investment.
  - ❖ Change in mentality, the moral channel.

# Changes in disease environment

- The disease-population balance (Livi-Bacci)
  - ❖ The intensity and virulence of diseases.
  - ❖ The influence of climate conditions on diseases.
  - ❖ But not strictly exogenous to population.
- The disease environment
  - ❖ Change in the 18<sup>th</sup> century with a reduction in high virulent diseases.
  - ❖ Relations with nutrition (sensitivity of diseases to nutritional status of the host).
  - ❖ Migrations and urbanization.
- Old and new diseases
  - ❖ The end of plague in the western world.
  - ❖ The blue death from Asia.
  - ❖ The rise of typhoid, tuberculosis, meningitis... But also poliomyelitis.

# Standard of living: the nutrition channel

- Simultaneity and swiftness of the decline
  - ❖ Improved living standard.
  - ❖ Especially nutrition (McKeown).
- Changes in the quantity and quality of food (Fogel).
  - ❖ Measuring calories intake.
  - ❖ Various channels of improvements: health and not only mortality reduction.
  - ❖ Effects on economic growth.
- Certainly part of the story (but which part?).

## Medical technology

- Fighting nature, one mosquito at a time
  - ❖ Role of knowledge and medical science.
  - ❖ Increasing belief in mankind's capacity to change his health and mortality.
- Different but complementary levels of medical knowledge
  - ❖ Best knowledge and practice.
  - ❖ Average practice.
  - ❖ The level of inequality.
- Very limited knowledge before the end of the 19<sup>th</sup> century
  - ❖ No understanding of “infection”.
  - ❖ Some understanding of diseases, and of “contagion”.
  - ❖ Mix of practical methods.

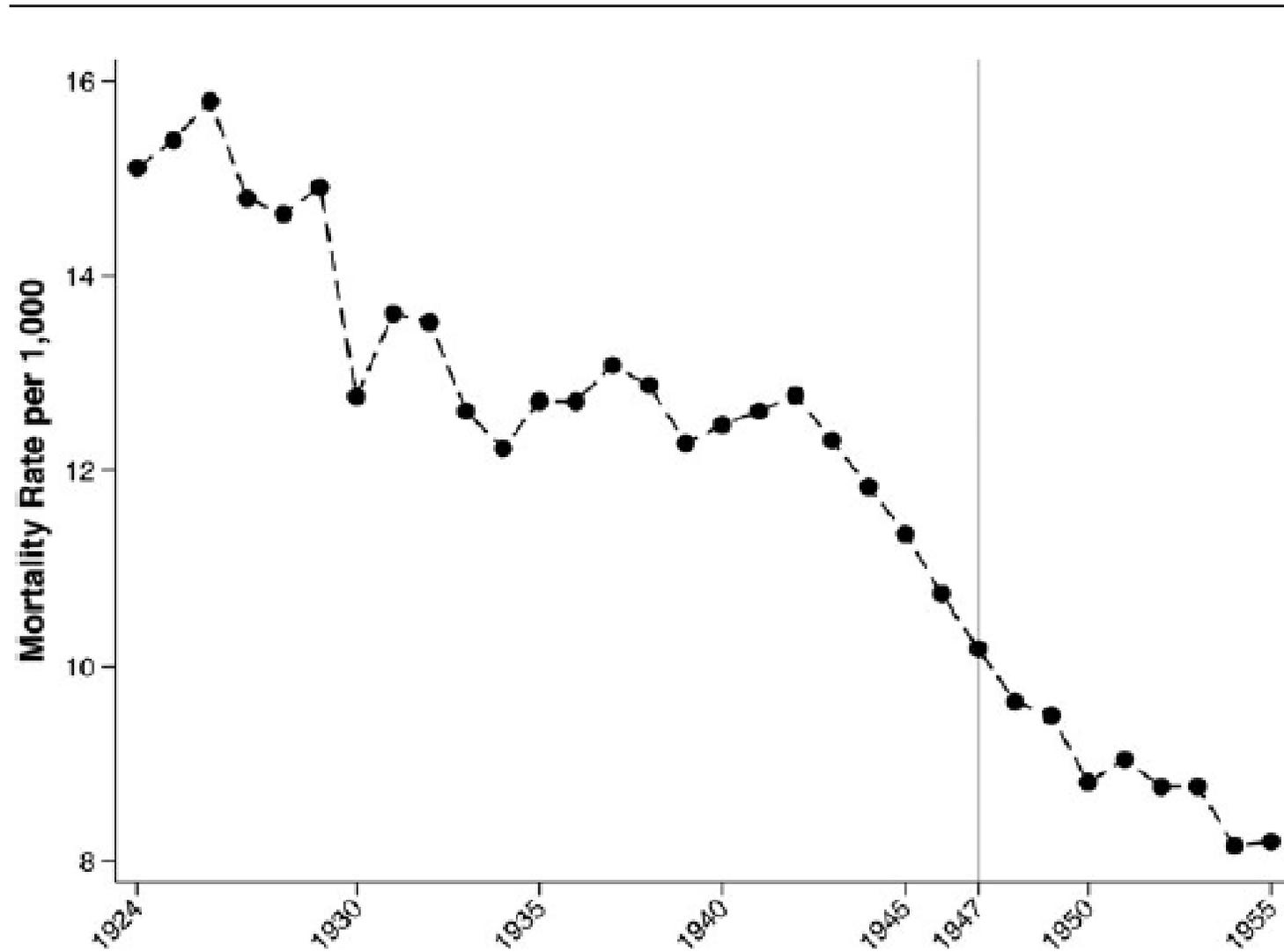
# The rise of (western) medical knowledge

- A general improvement with the Enlightenment.
  - ❖ Concomitant rise of statistical analysis, empirical testing, and medical theories.
  - ❖ A better understanding of the functioning of diseases.
- Vaccination
  - ❖ Jenner and smallpox.
  - ❖ World-wide diffusion.
  - ❖ The role of prevention (as opposed to cure).
- The emergence of the germ theory
  - ❖ Koch, Pasteur, and their disciples.
  - ❖ Understanding the transmission of diseases
  - ❖ Understanding the role of vectors: mosquito, water, food...

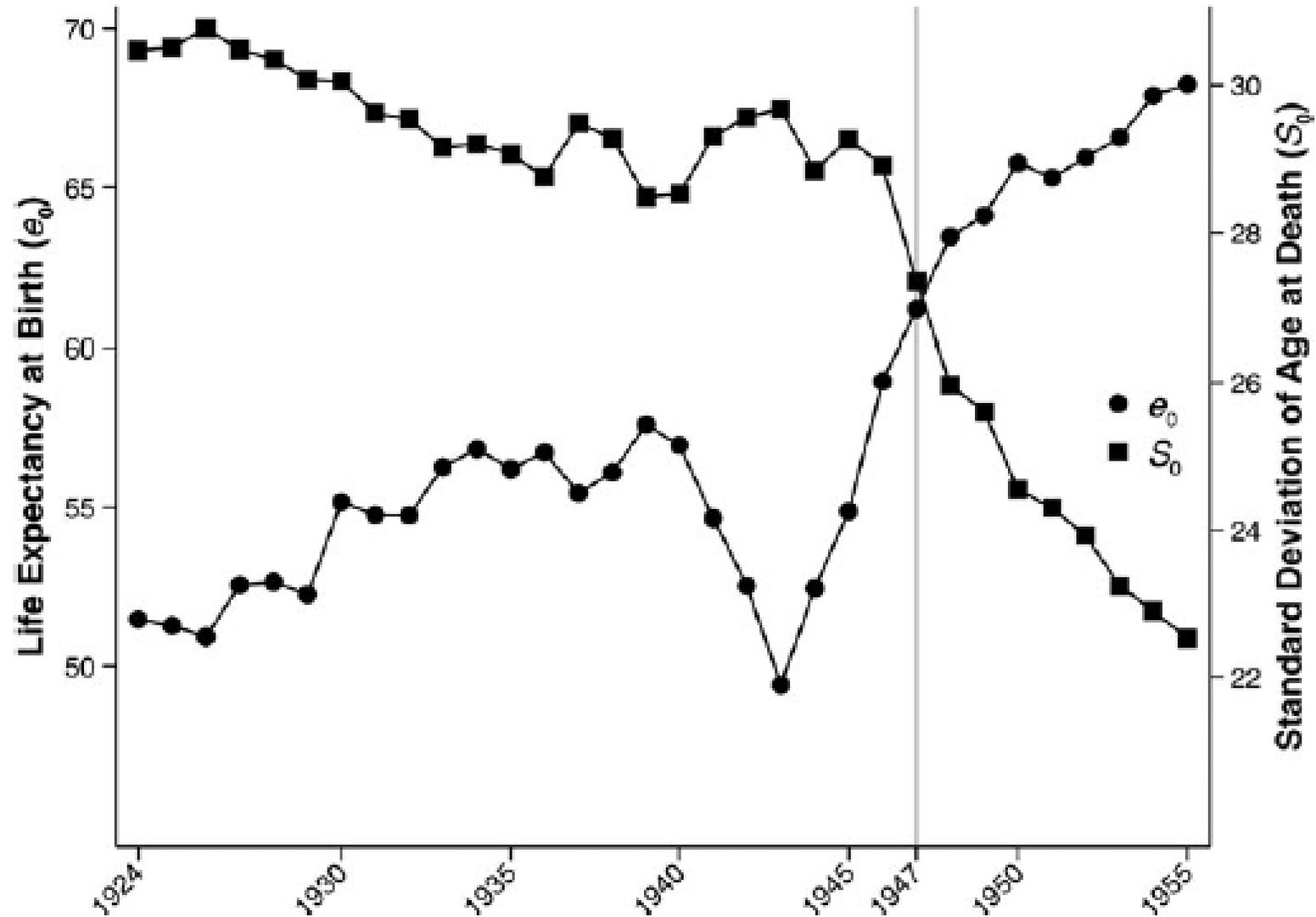
## Acceleration of change in the 20<sup>th</sup> century: the example of penicillin

- ❑ Marcella Alsan, Vincenzo Atella, Jay Bhattacharya, Valentina Conti, Iván Mejía-Guevara, Grant Miller; Technological Progress and Health Convergence: The Case of Penicillin in Postwar Italy. *Demography* 2021; 58 (4): 1473–1498.
- ❑ Studying the effects of the introduction of penicillin in Italy
  - ▲ Introduction in 1947.
  - ▲ Looking at both effect on average mortality and distributional effects (on regional mortality).
  - ▲ Comparing penicillin-sensitive and -insensitive diseases.
  - ▲ Comparing across regions.
- ❑ General decline in mortality
- ❑ Mortality convergence
  - ▲ Penicillin benefit everyone equally...
  - ▲ ... and contribute to a reduction in differences in mortality between regions.

# Overall mortality in Italy



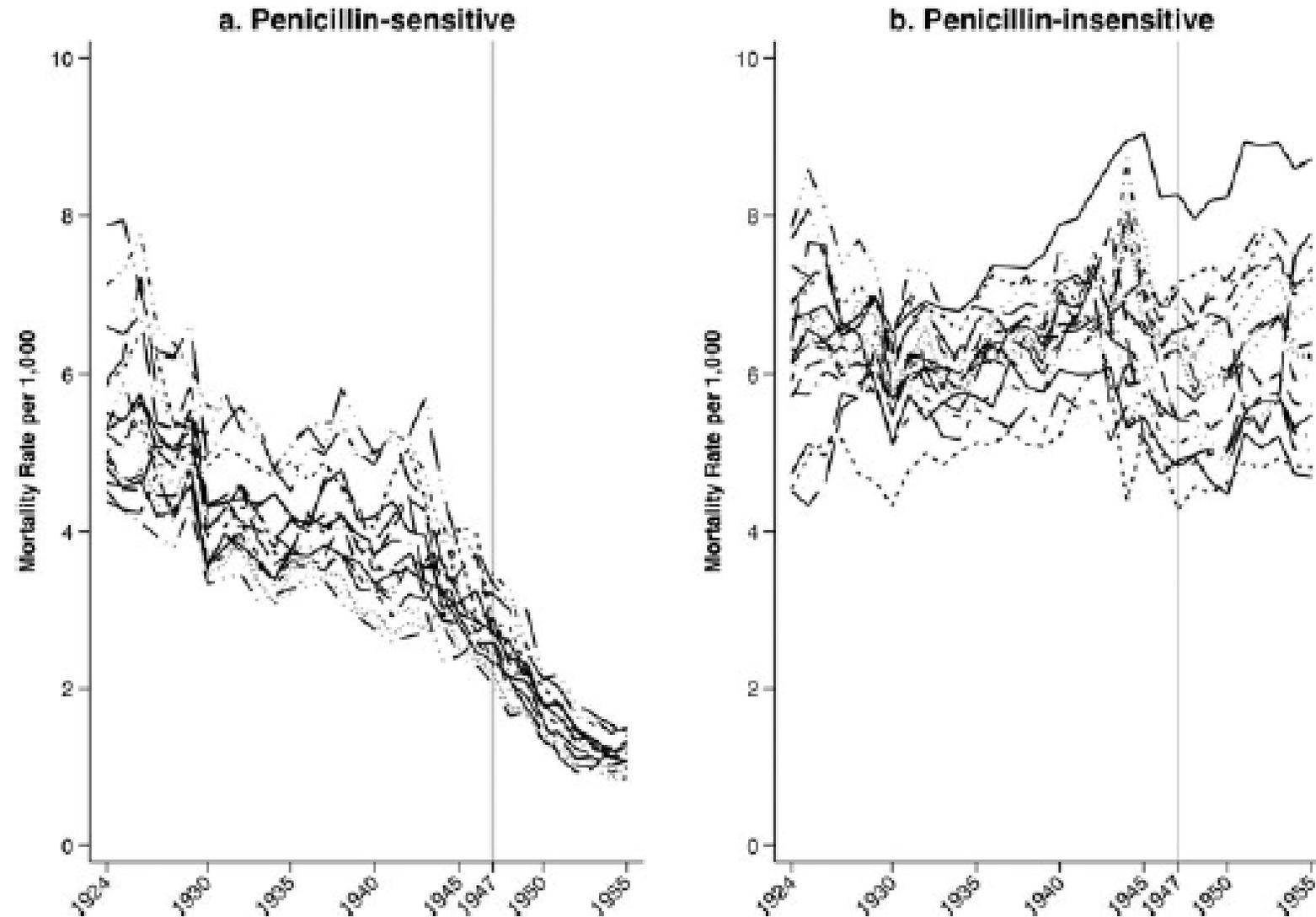
# Convergence in mortality in Italy



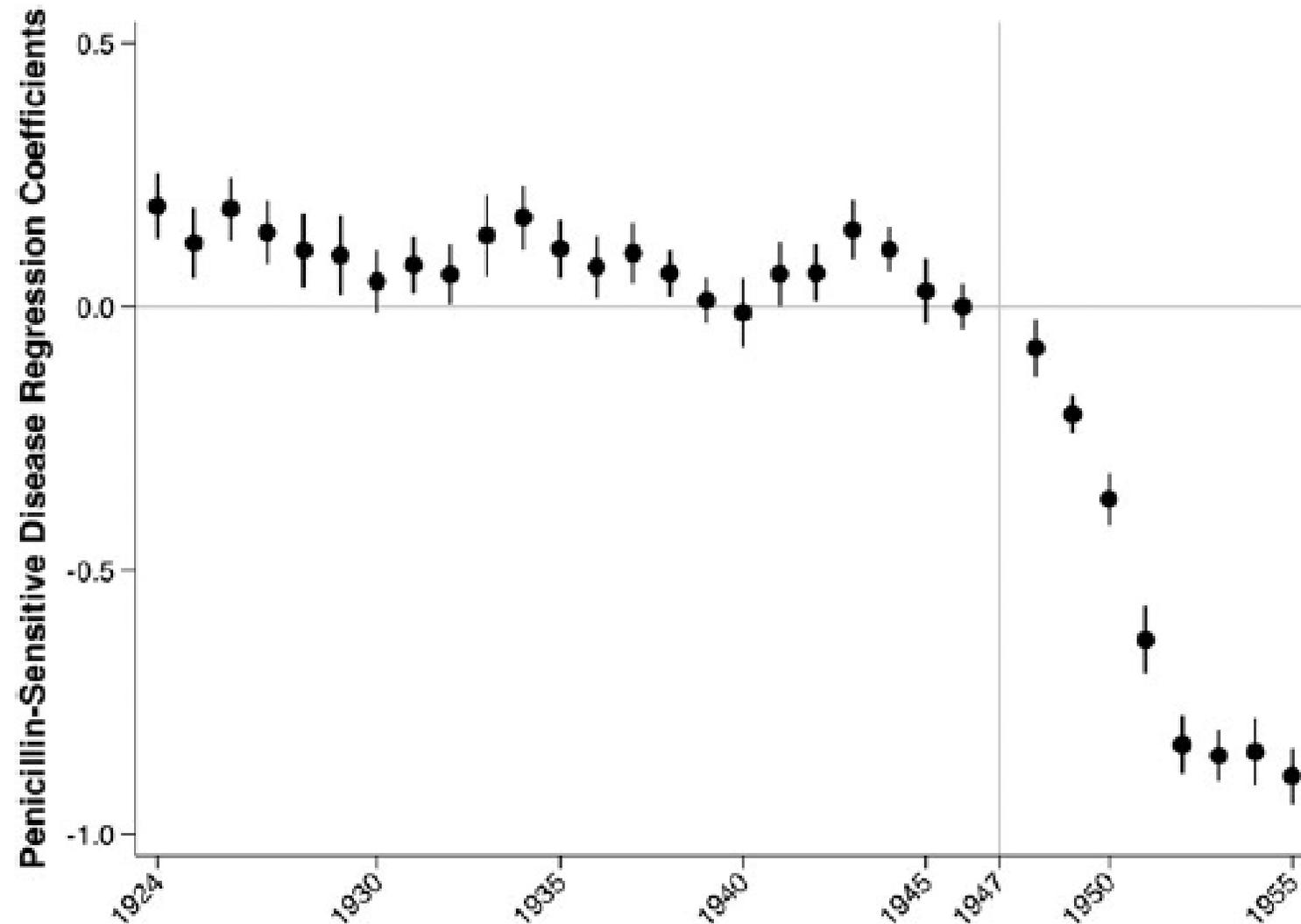
## Acceleration of change in the 20<sup>th</sup> century: the example of penicillin

- ❑ Marcella Alsan, Vincenzo Atella, Jay Bhattacharya, Valentina Conti, Iván Mejía-Guevara, Grant Miller; Technological Progress and Health Convergence: The Case of Penicillin in Postwar Italy. *Demography* 2021; 58 (4): 1473–1498.
- ❑ Studying the effects of the introduction of penicillin in Italy
  - ▲ Introduction in 1947.
  - ▲ Looking at both effect on average mortality and distributional effects (on regional mortality).
  - ▲ Comparing penicillin-sensitive and -insensitive diseases.
  - ▲ Comparing across regions.
- ❑ General decline in mortality
- ❑ Mortality convergence
  - ▲ Penicillin benefit everyone equally...
  - ▲ ... and contribute to a reduction in differences in mortality between regions.

# Evolution of mortality rate by disease type and regions



## Difference between penicillin-sensitive and insensitive disease over time



# The rise of (western) medical knowledge

- A general improvement with the Enlightenment.
  - ❖ Concomitant rise of statistical analysis, empirical testing, and medical theories.
  - ❖ A better understanding of the functioning of diseases.
- Vaccination
  - ❖ Jenner and smallpox.
  - ❖ World-wide diffusion.
  - ❖ The role of prevention (as opposed to cure).
- The emergence of the germ theory
  - ❖ Koch, Pasteur, and their disciples.
  - ❖ Understanding the transmission of diseases
  - ❖ Understanding the role of vectors: mosquito, water, food...

# The rise of (western) medical knowledge?

- Resistances and setbacks
  - ❖ Medical resistances: the slow acceptance of germ theory (e.g., Semmelweis).
  - ❖ Resistances among the public.
  - ❖ International diffusions.
- Very limited applications before the 20<sup>th</sup> century
  - ❖ Few vaccines beside Jenner (rabies, 1885...).
  - ❖ A very limited number of useful drugs.
  - ❖ No clear-cut between traditional and modern medicine, e.g. aspirin (1899).
- An ever changing picture
  - ❖ New and old diseases.
  - ❖ The need for wider social transformations.

# The vaccination beast

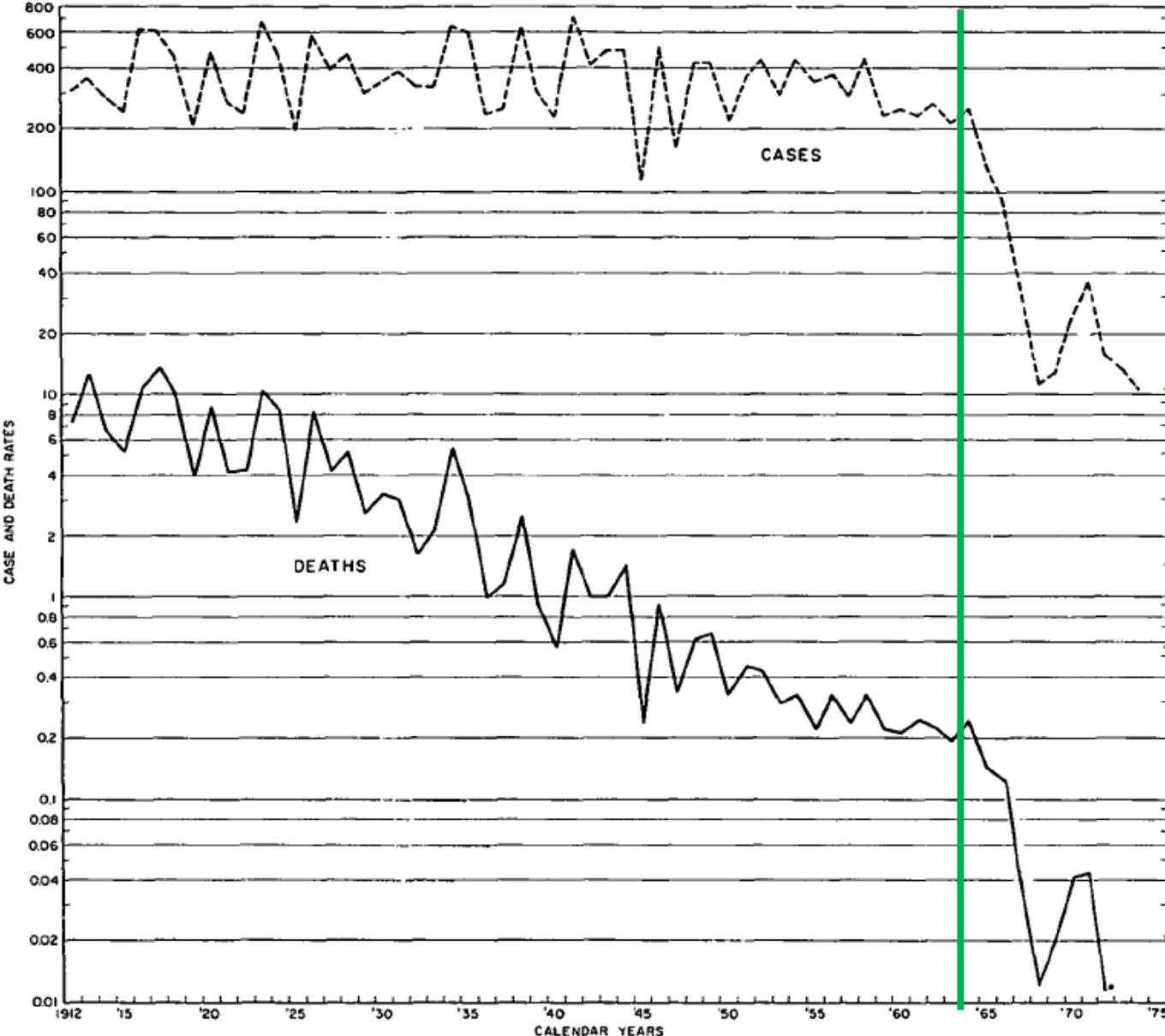


Charles Williams (c. 1802)

# The rise of (western) medical knowledge?

- Resistances and setbacks
  - ❖ Medical resistances: the slow acceptance of germ theory (e.g., Semmelweis).
  - ❖ Resistances among the public.
  - ❖ International diffusions.
- Very limited applications before the 20<sup>th</sup> century
  - ❖ Few vaccines beside Jenner (rabies, 1885...).
  - ❖ A very limited number of useful drugs.
  - ❖ No clear-cut between traditional and modern medicine, e.g. aspirin (1899).
- An ever changing picture
  - ❖ New and old diseases.
  - ❖ The need for wider social transformations.

# Mortality and case of measles in the US



Barkin, Roger m. 1975. "Measles mortality: A retrospective look at the vaccine era1." *American Journal of Epidemiology* 102 (4): 341-49.

# Public health

- Initial interventions
  - Control of epidemics: cordon sanitaire, lazaret and co.
- Rise in public interest
  - *Report on the sanitary condition of the British working class*, 1842.
  - Public Health Act, 1848.
- The development of vaccination
  - The concomitant rise of statistics, public health and probability theory.

# Sanitary movement

- Rise of statistical data and analysis.
  - ❖ Measuring mortality.
  - ❖ P.-C. Louis vs F. Broussais.
  - ❖ Snow, *On the Mode of Communication of Cholera*, 1849.
- Large-scale publications and journals.
  - ❖ *American Journal of the Medical Sciences*, 1820.
  - ❖ *Annales d'hygiène publique*, 1829.
- Interaction with society at large.
  - ❖ Importance of vector, nutriment, etc.

**John Graunt**  
(1620-1674)  
haberdasher in  
London  
then *fellow*  
of the Royal  
Society

Natural and  
Political  
Observations...  
(*London, 1662*)

*Natural and Political*  
**OBSERVATIONS**  
Mentioned in a following INDEX,  
and made upon the  
Bills of Mortality.

---

By *JOHN GRAUNT*,  
Citizen of  
**LONDON.**

---

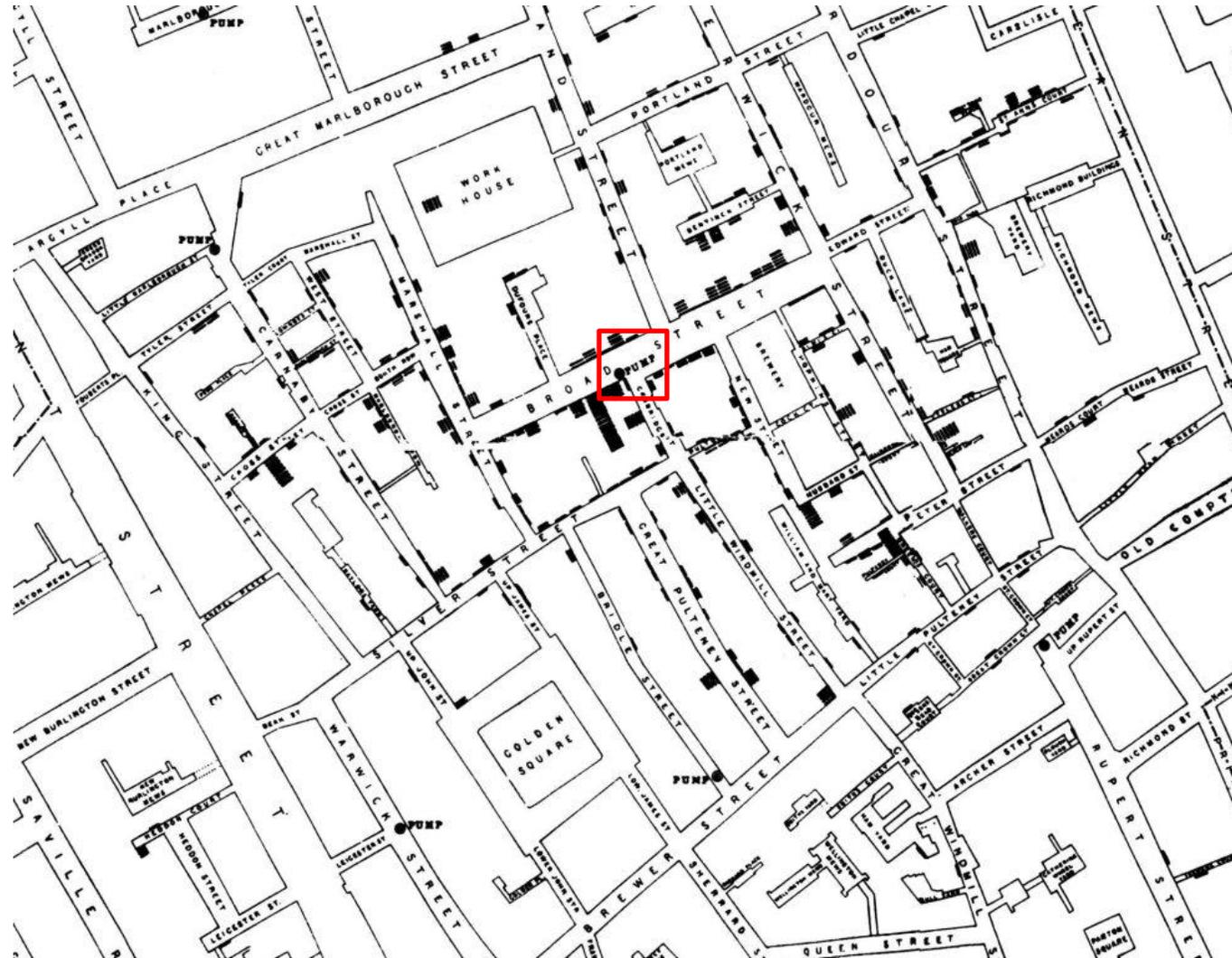
With reference to the *Government, Religion, Trade,*  
*Growth, Ayre, Diseases,* and the several Changes of the  
said C I T Y.

**L O N D O N,**  
Printed by *Tho: Roycroft*, for *John Martin, James Allestry,*  
and *Tho: Ducas*, at the Sign of the Bell in *St. Paul's*  
Church-yard, **MDCLXII.**

# Sanitary movement

- Rise of statistical data and analysis.
  - ❖ Measuring mortality.
  - ❖ P.-C. Louis vs F. Broussais.
  - ❖ Snow, *On the Mode of Communication of Cholera*, 1849.
- Large-scale publications and journals.
  - ❖ *American Journal of the Medical Sciences*, 1820.
  - ❖ *Annales d'hygiène publique*, 1829.
- Interaction with society at large.
  - ❖ Importance of vector, nutriments, etc.

# John Snow's map of Cholera near Broad street



# Sanitary movement

- Rise of statistical data and analysis.
  - ❖ Measuring mortality.
  - ❖ P.-C. Louis vs F. Broussais.
  - ❖ Snow, *On the Mode of Communication of Cholera*, 1849.
- Large-scale publications and journals.
  - ❖ *American Journal of the Medical Sciences*, 1820.
  - ❖ *Annales d'hygiène publique*, 1829.
- Interaction with society at large.
  - ❖ Importance of vector, nutriment, etc.

# *Homo hygienicus*

- Large scale changes
  - ❖ Personal hygiene.
  - ❖ Change in clothing.
- How to diffuse new ideas in sanitation
  - ❖ Experts and doctors.
  - ❖ Development of hygienist movements, societies, etc.
  - ❖ Direct propaganda.
- Special attention to the children
  - ❖ The role of hygiene at home.
  - ❖ For instance: *la goutte de lait*.
- Home economics
  - ❖ The direct result of the germ theory.

# *The democratization of a long life*

- Large scale changes in human life pattern
  - ❖ Decline in mortality, increase in life expectancy, mortality move from early ages to old age.
  - ❖ Change in diseases structure: away from infectious diseases, and less lethal diseases, development of chronic diseases
  
- Explaining the change
  - ❖ Medicine? Smallpox vaccination mattered, but is a little isolated. Most important innovations were in the 20<sup>th</sup> century.
  - ❖ Change in Diseases environment? Increasing trade and movement expanded range of diseases; growth of cities.
  - ❖ Nutrition? Increase in quantity and quality of food, but mortality improvement is more general.
  - ❖ Public health? Health become a topic of investigation, rise in public interest, sanitary movement.
  
- A change in mentality? *Homo hygienicus* and Home economics
  - ❖ Experts and doctors: development of hygienist movements, societies, etc.
  - ❖ Personal hygiene and taking care of home.
  - ❖ The direct result of the germ theory.

# REFERENCES

## Part 1. The health transition

- Preston, Samuel H. 1975. “The Changing Relation between Mortality and Level of Economic Development.” *Population Studies* 29 (2): 231–48.
- Omran (1971) “The Epidemiologic Transition: A Theory of the Epidemiology of Population Change”. *The Milbank Memorial Fund Quarterly* 49 (4): 509-38.
- Weisz, George, and Jesse Olszynko-Gryn. 2010. “The Theory of Epidemiologic Transition: The Origins of a Citation Classic.” *Journal of the History of Medicine and Allied Sciences* 65 (3): 287–326.
- Vallin, Jacques, and France Meslé. 2004. « Convergences and Divergences in Mortality: A New Approach of Health Transition ». *Demographic Research Special* 2: 11-44
- Caselli, Graziella and Jacques Vallin. 2006. “Variation through time of age-specific rate” in Caselli, Graziella, Jacques Vallin, and Guillaume J. Wunsch. *Demography: Analysis and Synthesis*. Volume 1. Amsterdam ; Boston: Elsevier, 51-54.
- Brouard, Nicolas. 1997. *Health expectancy: multi-state method, incidence based versus prevalence based*. Paris: Ined.
- Jacques Vallin and Giovanni Berlinguer. 2006. “From endogenous mortality to the maximum human life span” in Caselli, Graziella, Jacques Vallin, and Guillaume J. Wunsch. *Demography: Analysis and Synthesis*. Volume 2. Amsterdam ; Boston: Elsevier, 95-115.
- Wilmoth, John R., and Shiro Horiuchi. 1999. “Rectangularization Revisited: Variability of Age at Death within Human Populations.” *Demography* 36 (4): 475–95.
- Permanyer, Iñaki, and Nathalie Scholl. 2019. “Global Trends in Lifespan Inequality: 1950-2015.” *PLOS ONE* 14 (5): e0215742.
- Olshansky, S. J., and A. B. Ault. 1986. « The Fourth Stage of the Epidemiologic Transition: The Age of Delayed Degenerative Diseases ». *The Milbank Quarterly* 64 (3): 355-91.
- Rogers, Richard G., and Robert Hackenberg. 1987. « Extending epidemiologic transition theory: A new stage ». *Social Biology* 34 (3-4): 234-43.
- Olshansky, S. J., B. Carnes, R. G. Rogers, and L. Smith. 1997. « Infectious Diseases -- New and Ancient Threats to World Health ». *Population Bulletin* 52 (2): 1-52.

## Part 2. Explaining the mortality decline

- Livi Bacci, Massimo. 1990. *Population and nutrition: an essay on European demographic history*. Cambridge studies in population, economy, and society in past time 14. Cambridge [England] ; New York: Cambridge University Press.
- Bourdelais, Patrice (1949- ) Auteur du texte, and Jean-Yves Auteur du texte Raulot. 1987. *Histoire du choléra en France : une peur bleue : 1832-1854 / Patrice Bourdelais, Jean-Yves Raulot*.
- McKeown, Thomas. 1976. *The modern rise of population*. London: Academic Press.
- Harris, Bernard. 2004. « Public Health, Nutrition, and the Decline of Mortality: The McKeown Thesis Revisited ». *Social History of Medicine* 17 (3): 379-407.
- Fogel, Robert W. 2004. *The escape from hunger and premature death, 1700-2100 Europe, America and the Third World*. Cambridge New York: Cambridge University Press.
- Fogel, Robert William. “Nutrition and the Decline in Mortality Since 1700: Some Preliminary Findings.” In *Long-Term Factors in American Economic Growth*, 439–556. Edited by Engerman, Stanley L. and Gallman, Robert E. Chicago: University of Chicago Press, 1986.
- Johansson, Sheila Ryan. 2005. « Fogel and the History of Mortality ». *Population Studies* 59 (2): 247-53.
- Deaton, Angus. 2006. « The Great Escape: A Review of Robert Fogel’s *The Escape from Hunger and Premature Death, 1700–2100* ». *Journal of Economic Literature* 44 (1): 106-14.
- Floud, Roderick, Robert W. Fogel, Bernard Harris, and Chul Sok Hong. 2011. *The Changing Body. Health, Nutrition, and Human Development in the Western World since 1700*. Cambridge: Cambridge University Press and NBER.