

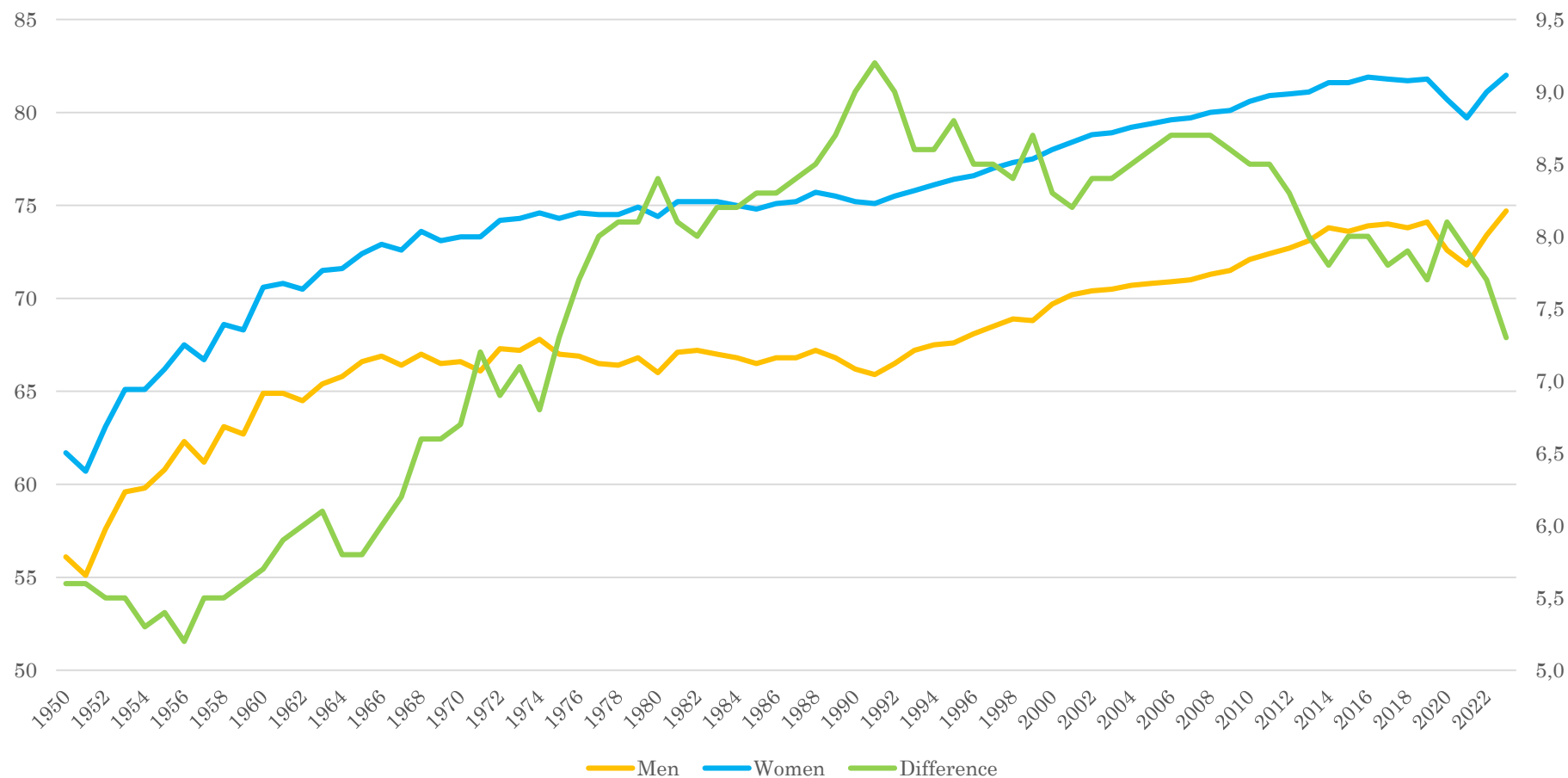
Mortality

Łukasz Byra

Demography

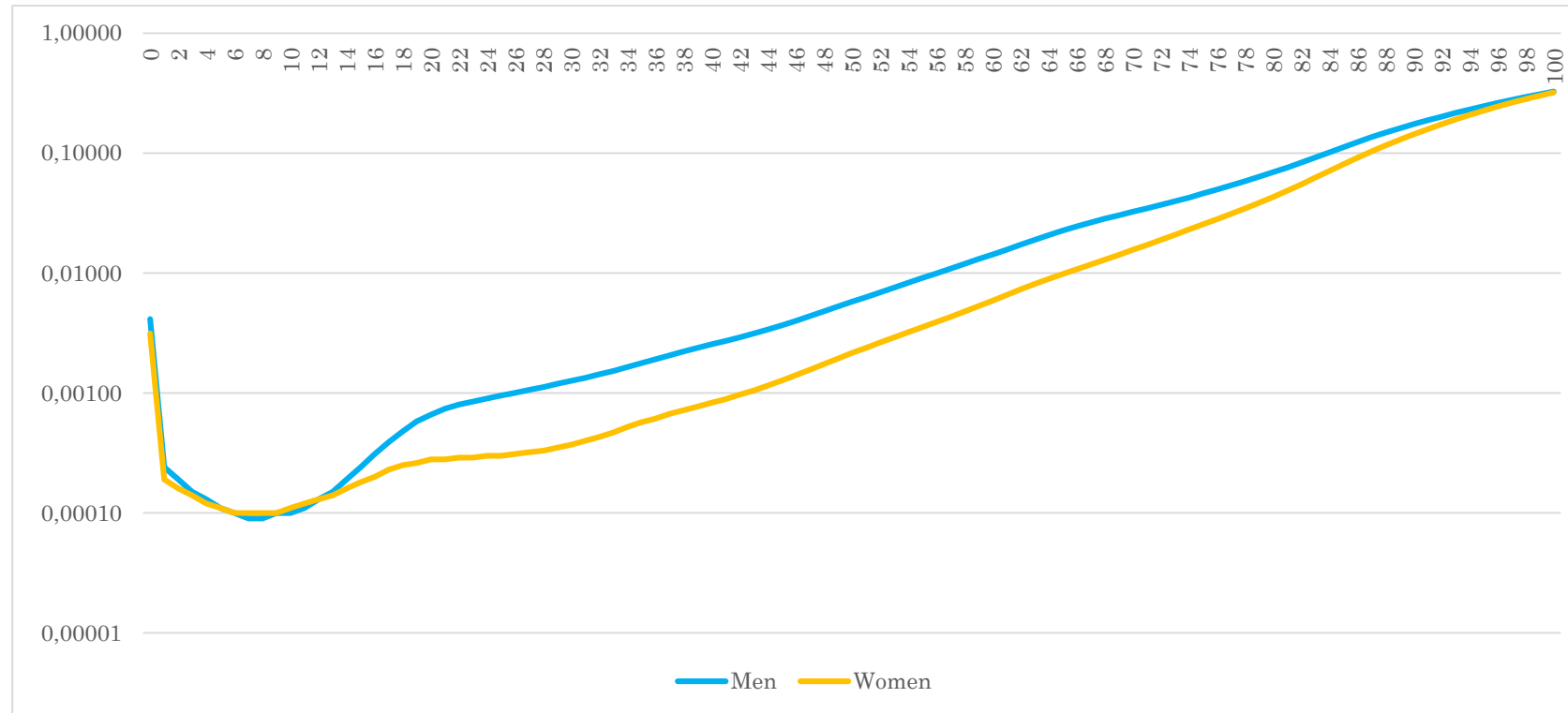
Data

Life expectancy at birth in Poland, 1950-2023



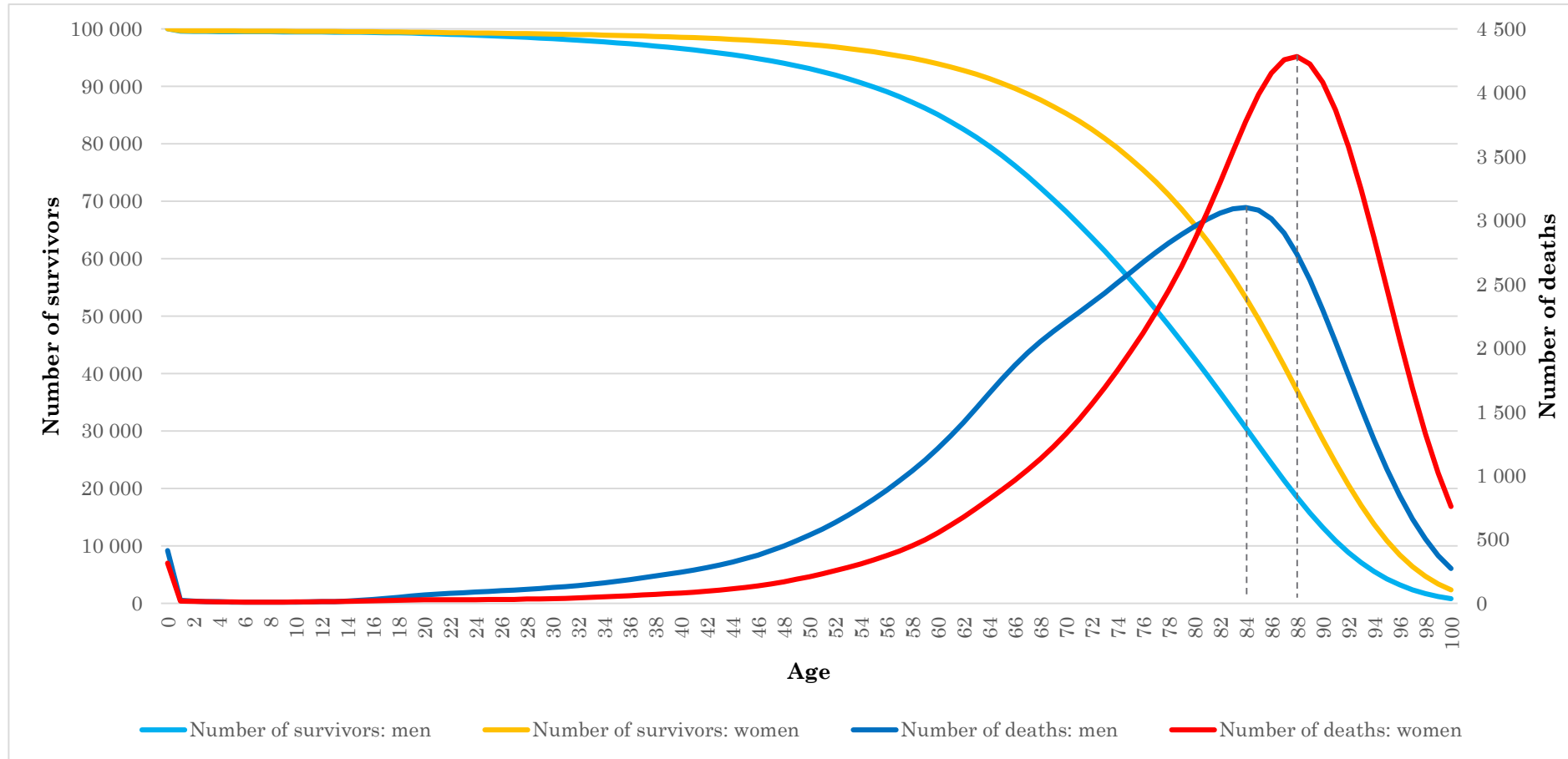
Source: Polish CSO

Probability of death within one year in Poland, by age, 2023



Source: Polish CSO

Survivals to a given age and the number of deaths at a given age, Poland, 2023



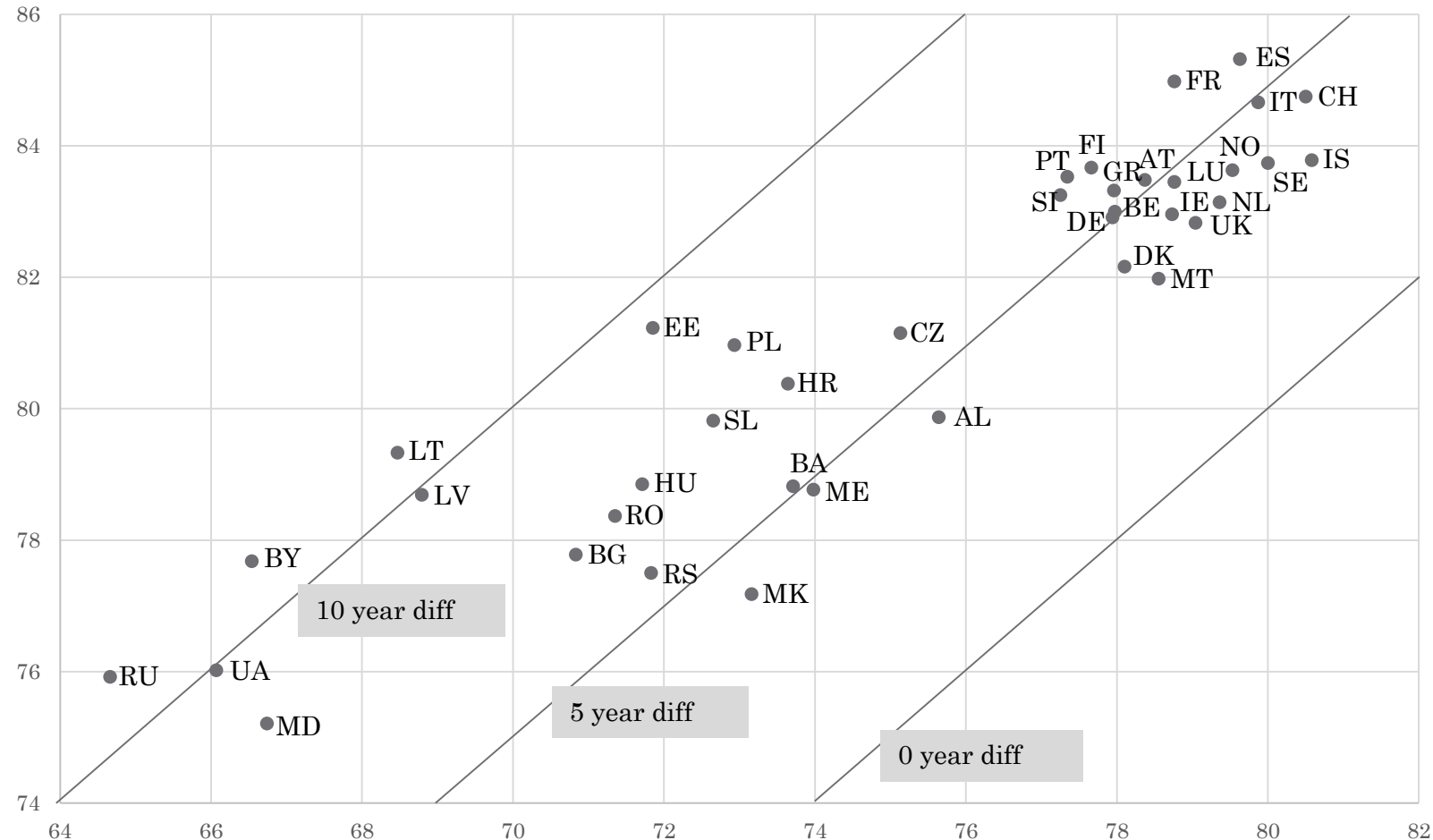
Source: Polish CSO

Share of people who did not reach a given age, by sex, 2023

	18	45	75
Men	0.7	4.8	43,6
Women	0.6	1.9	22.6

Source: Polish CSO

Life expectancy at birth in Europe of men (horizontally) and women (vertically), 2016



Source: UN population prospects 2017

Survival probability to age 75, men, Europe, 2021

#	Country	Pr	#	Country	Pr
1	Monaco	83,6%	23	Germany	65,6%
2	Norway	78,5%	24	Slovenia	64,9%
3	Switzerland	78,4%	25	Andorra	63,0%
4	Iceland	77,1%	26	Albania	58,5%
5	Sweden	76,9%	27	Czechia	55,7%
6	Liechtenstein	76,4%	28	Croatia	53,1%
7	Malta	75,6%	29	Montenegro	50,0%
8	Ireland	75,4%	30	Bosnia and Herzegovina	48,4%
9	Netherlands	74,9%	31	Estonia	48,4%
10	Italy	74,1%	32 Poland	48,3%	
11	Luxembourg	72,9%	33	Slovakia	45,1%
12	Denmark	72,3%	34	North Macedonia	44,9%
13	Spain	72,2%	35	Hungary	42,6%
14	Finland	71,6%	36	Serbia	42,5%
15	France	70,8%	37	Romania	40,6%
16	Belgium	70,7%	38	Latvia	38,5%
17	Austria	69,8%	39	Lithuania	38,4%
18	United Kingdom	69,5%	40	Bulgaria	35,8%
19	San Marino	66,9%	41	Ukraine	33,2%
20	Portugal	66,6%	42	Belarus	30,9%
21	Gibraltar	65,9%	43	Russian Federation	28,2%
22	Greece	65,8%	44	Republic of Moldova	25,0%

Source: UN population prospects 2022

Survival probability to age 75, women, Europe, 2021

#	Country	Pr	#	Country	Pr
1	Monaco	89,2%	23	Germany	79,7%
2	Switzerland	87,0%	24	United Kingdom	79,3%
3	Spain	86,0%	25	Gibraltar	77,4%
4	Liechtenstein	85,8%	26	Croatia	76,8%
5	Norway	85,0%	27	Czechia	75,8%
6	Italy	84,9%	28	Estonia	74,0%
7	Malta	84,9%	29	Albania	73,9%
8	Sweden	84,9%	30	Poland	72,7%
9	Finland	84,8%	31	Montenegro	71,1%
10	France	84,3%	32	Lithuania	69,7%
11	Portugal	83,6%	33	Slovakia	69,1%
12	Iceland	83,5%	34	Latvia	66,6%
13	Luxembourg	83,2%	35	Romania	66,3%
14	Ireland	83,1%	36	Bosnia and Herzegovina	65,9%
15	Austria	82,5%	37	Hungary	65,8%
16	Slovenia	82,4%	38	Belarus	65,6%
17	Andorra	82,1%	39	Ukraine	64,5%
18	Belgium	82,0%	40	Serbia	64,1%
19	Netherlands	81,9%	41	North Macedonia	62,6%
20	Denmark	81,4%	42	Bulgaria	60,8%
21	San Marino	81,3%	43	Russian Federation	60,2%
22	Greece	80,0%	44	Republic of Moldova	53,8%

Źródło: UN population prospects 2022

Secular decline in mortality in the 19th and 20th centuries and its causes

Fogel R.W. (1986, 1995, 2004)

Life expectancy at birth in seven nations, 1725-1990

	1725	1750	1800	1850	1900	1950	1990
England or UK	32	37	36	40	48	69	76
France		26	33	42	46	67	77
US	50	51	56	43	48	68	76
Egypt					27	39	59
China						41	70
India						42	60
Japan						61	79

Source: Fogel (2004) *The escape from hunger and premature death, 1700-2100*, Cambridge: Cambridge University Press.

Historical background

- The drive to explain the secular decline in mortality did not begin until about World War I
- Reasons:
 - Initial lack of data
 - Little evidence of decline in mortality in the first available English life tables (1831-80)
 - Malthus' population theory did not allow for such a mortality decline
 - When the first evidence of a decline in mortality begun to appear (1880-90), the scientific focus was directed not on the small decline in aggregate mortality, but on the continuing large differentials between urban and rural areas, low- and high-income districts, and among different nations
- The beginning of the 20th century: things become evident
 - Between 1900 and 1920 life expectancy in Britain increased by nearly 12 years
 - Between 1920 and 1930 it increased by additional four years
 - Overall, an increase of 20 years between 1830 and 1930
- When the improvement in life expectancy became apparent, research to explain its foundation started

Research directions and early results

- The drive to explain the secular decline in mortality pushed research in three directions
 1. Construction of time series of birth and death rates that extend as far back in time as possible
 - Collecting baptism and burial data from parishes in England, France, and Sweden
 - The decline in mortality begun in North-West Europe around the middle of the 18th century
 2. Available data were analyzed to determine factors that might explain the decline and establish patterns / laws that would make it possible to predict future mortality
 3. Somewhat later, efforts were undertaken to determine the relationship between food supply and mortality rates
- Early hypotheses (a UN 1953 study) on the determinants of the decrease in mortality:
 - Public health reforms
 - Advances in medical knowledge and practices
 - Improvements in personal hygiene
 - Rising income and standards of living
- In 1973 the UN added „natural causes” such as lower virulence of pathogens or acquired immunity through natural selection

Thomas McKeown and the attempt to undermine early hypotheses

- McKeown proposed that the decrease in mortality was a consequence of **better nutrition**
- He did not make his case for nutrition directly, but largely through a residual argument after having rejected other principal reasons
- He listed arguments against the key role of
 - Public health reforms
 - Advances in medical knowledge and practices
 - Improvements in personal hygiene
- He presented arguments in favor of the hypothesis relating the decrease in mortality to improved nutrition
 - Growing food supply, but only since the end of the 19th century
 - Studies linking malnutrition with the risk of infection
 - WHO report about malnutrition as a co-reason of 57-67% of deaths of children up to 5 years old in Latin America