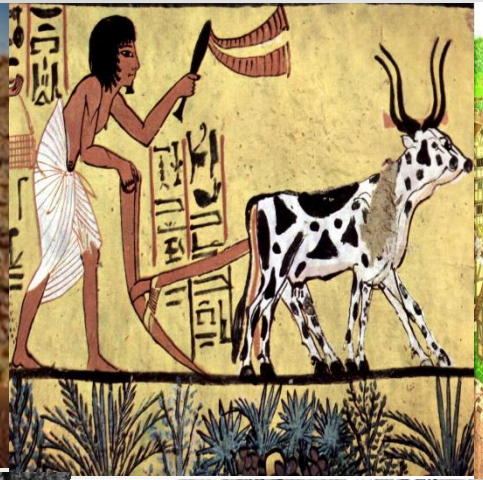
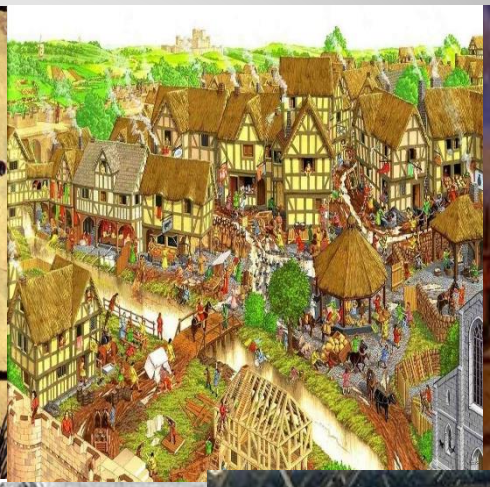
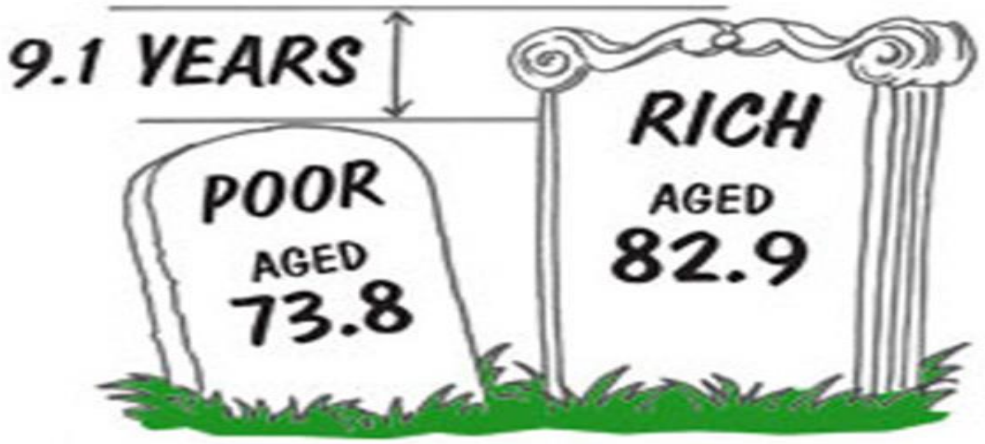
Health and Illness in society- the historical transformation of mortality patterns



- Aim of the course: To make you see how social factors influence health outcomes and the way people experience health, illness and health care.
- Aim today: Provide **historical** evidence that social, economic and cultural conditions have a major effect on patterns of disease and mortality



- **Some basic concepts you need for today:**
- **Epidemiology-** the study of patterns of health and illness at the population level. Which **group** of people got sick/ died? When? Where? Of what?

↳ **life expectancy-** key measures of a population's health. It refers to the number of years people born in a given period and region are expected to live based on the statistical average

↳ **GDP per capita -**Gross domestic product is the total value of everything produced in the country divided by the country's population. It is supposed to be a measure of a country's standard of living.

- http://www.gapminder.org

The epidemiological triangle theory of infectious disease

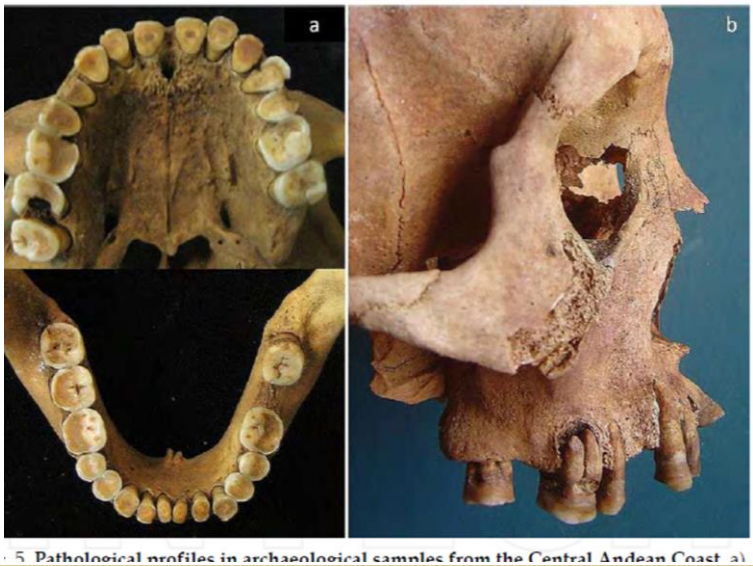
- Disease is the result of an interaction between agent, host and environment
- **Agent**- microbes etc.. Whose presence is necessary to produce disease
- **Host**-immunological status, behaviour, genetics which influence susceptibility
- **Environment**- external factors influencing onset of disease. Social-physical-scientific

Epidemiological transitions: *Profound changes of death rates and life expectancies through history*

- **Epidemiological periods/ phases/ stages** periods when death rates, life expectancy and types of disease are fairly constant
- *Pre-history* (before the epidemiological periods)
- *1st epidemiological period* The Age of Pestilence and Famine from 9th/4th Century BCE to1850
- *2nd epidemiological period* The Age of Receding Pandemics 1850-1945
- *3rd epidemiological period* The Age of Degenerative and Man-Made Diseases 1945-1975
- *4th epidemiological period* age of delayed degenerative disease 1975- today

Pre-history: Hunters and gatherers:

- Very low life expectancy (25years)
- Low disease transmission, no infectious disease
- Very low population
- diet was scarce, occasional famines
- Low life expectancy due to:
- Injuries- hunting accidents
- Exposure to the elements
- Very high infant mortality
- Childbirth related death



5. Pathological profiles in archaeological samples from the Central Andean Coast. a)

- *1st epidemiological period* The Age of Pestilence and Famine 9th-4th Century BCE-1850
- Higher populations, permanent settlements, agriculture
- High infectious disease mortality- limited medical knowledge to combat infections
- Poverty, low hygiene, malnutrition, famines, low resistance to infections
- Higher birthrate and high infant mortality (up to 30%)
- Fecal contamination, unsafe drinking water, rodents,
- **Epidemics**: bouts of infections disease in large areas
- **Pandemics**: epidemics over many countries
- Life expectancy 20-40 yrs
- With urban concentration of populations, it became even worse

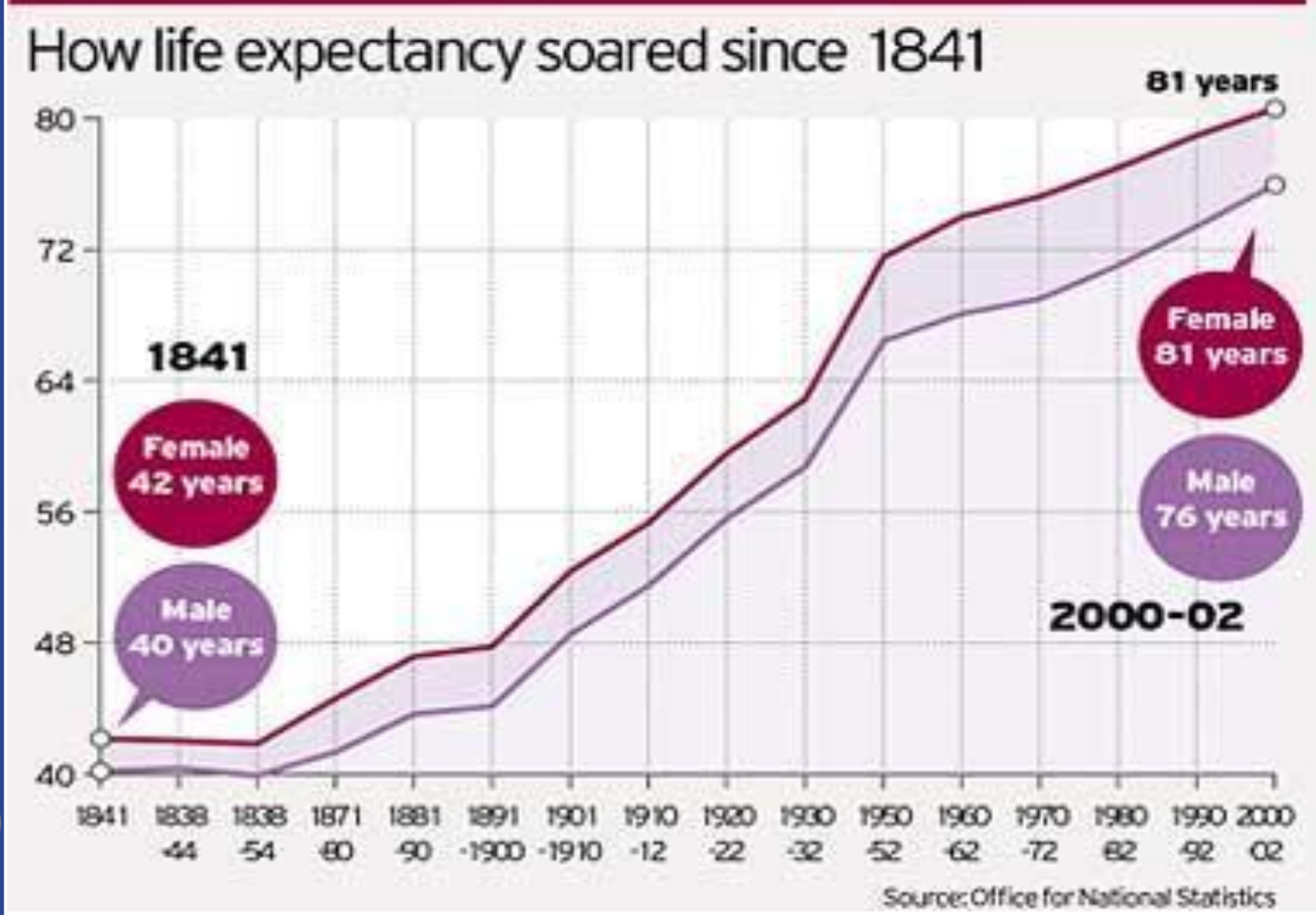
The Black Death in Numbers

- **From 1347 to 1350 the Black Death struck Europe:**
  - In less than two years **30% to 60%** of the population of Europe was wiped out.
  - Nearly **75 million** died in western Europe alone.
  - **18000** people died in London in the course of three years.
  - Almost **1/3** of the worlds population had died from the plague by 1350.
  - Estimates go from **100 to 200 million** deaths worldwide.
  - The mortality rate of the bubonic plague was **30% to 75% percent**.
  - Huge social, economic, political consequences https://en.wikipedia.org/wiki/List_of_epidemics

2nd epidemiological period *The Age of Receding Pandemics* 1850-1945

- Early industrial city life was characterized by high mortality and low life expectancy from **endemics** (infectious disease of local significance only,) but.....
- The giant killers like tuberculosis, typhus, typhoid, smallpox, pneumonia, diarrhea or cholera started to decline from the mid to late 19 century

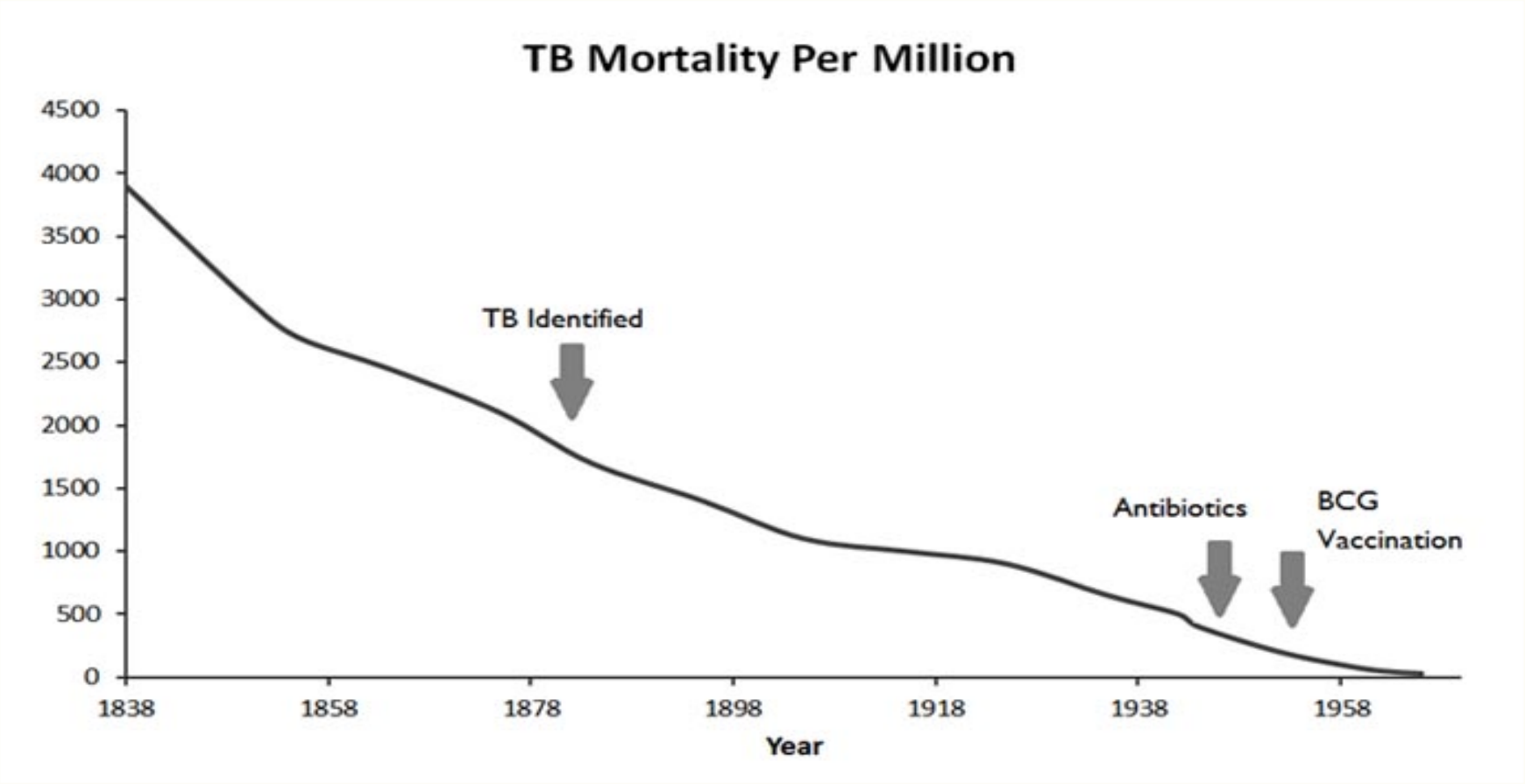
Why?


How life expectancy soared since 1841
81 years
80
72
64
56
48
40
1841
Female
42 years
Male
40 years
Female
81 years
Male
76 years
2000-02
1841
1838 -44
1838 -54
1871 -80
1881 -90
1891 -1900
1901 -1910
1910 -12
1920 -22
1930 -32
1950 -52
1960 -62
1970 -72
1980 -82
1990 -92
2000 -02
Source: Office for National Statistics

The role of medicine?

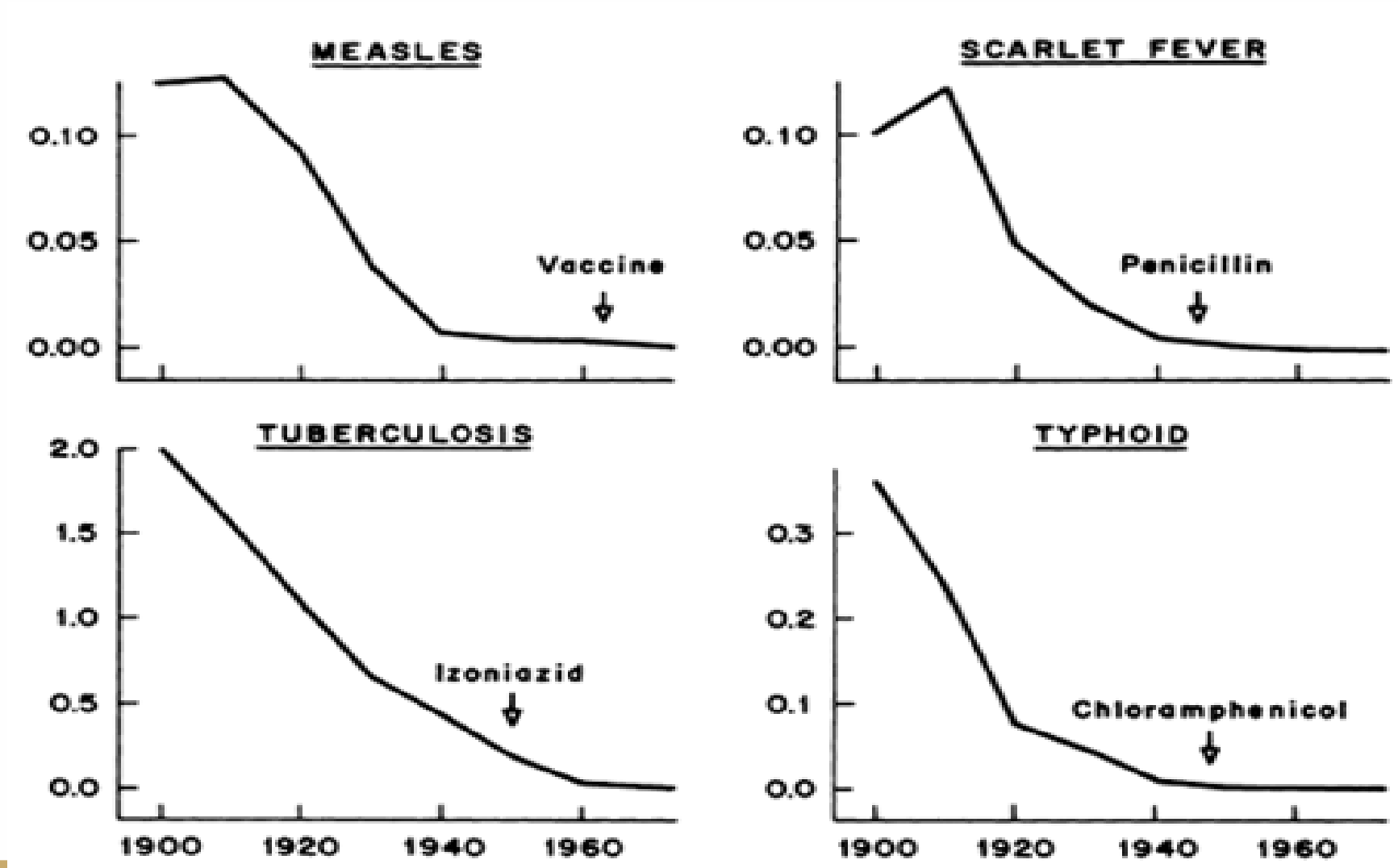
TBC mortality stated to decline independently of medical discoveries

without concern.



http://www.orthomolecular.org/resources/omns/v09n12-graph.jpg

Figure 1. Mortality tendencies of certain infectious diseases and their medical treatment (Source: McKeown 1976)



NOTICE.

PREVENTIVES OF

CHOLERA!

Published by order of the Sanatory Committee, under the sanction of the Medical Counsel.

BE TEMPERATE IN EATING & DRINKING!

Avoid Raw Vegetables and Unripe Fruit !.

Abstain from COLD WATER, when heated, and above all from *Ardent Spirits*, and if habit have rendered them indispensable, take much less than usual.

SLEEP AND CLOTHE WARM !

DO NOT SLEEP OR SIT IN A DRAUGHT OF AIR.

Avoid getting Wet !

Attend immediately to all disorders of the Bowels.

TAKE NO MEDICINE WITHOUT ADVICE.

Medicine and Medical Advice can be had by the poor, at all hours of the day and night, by applying at the Station House in each Ward.

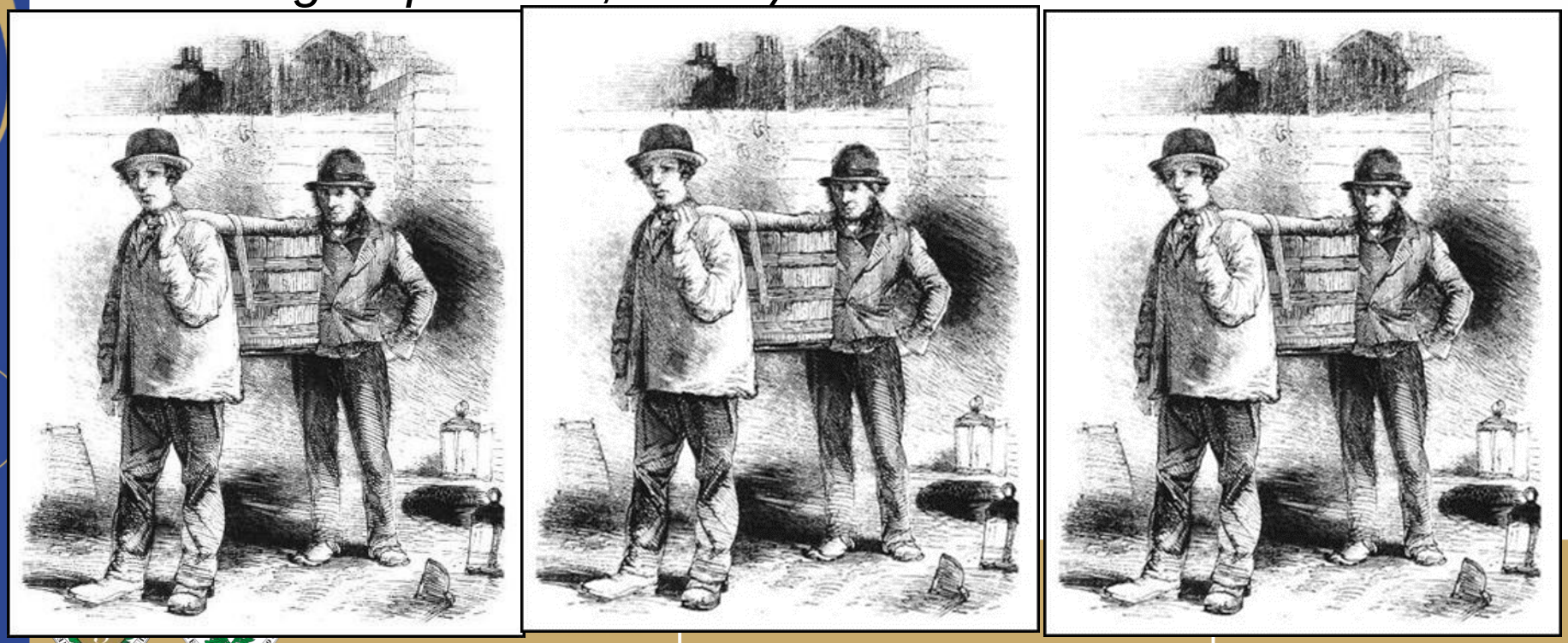
CALEB S. WOODBULL, *Mayor.*

JAMES KELLY, *Chairman of Sanatory Committee.*

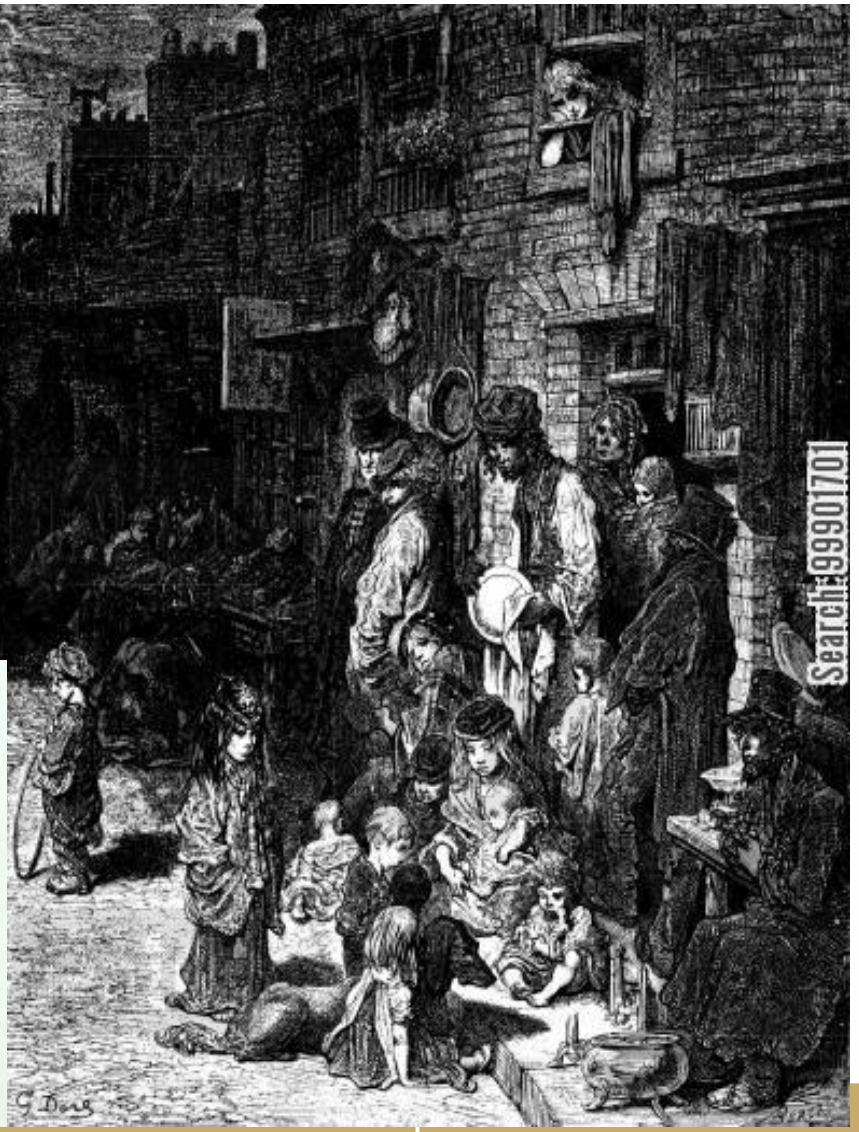
- **Until 1880, The ‚enemy' was dirt and stink (miasma)**
- 1842 Crawford W. Long uses either as a general anesthetic
- 1844 Dr. Horace Wells uses nitrous oxide as an anesthetic
- 1847 Semmelweis discovers how to prevent the transmission of puerperal fever
- 1854 Filippo Pacini isolated the cholera bacterium Vibrio cholerae (nobody knew about his discovery
- 1867 Joseph Lister develops antiseptic surgical methods
- 1870 Koch and Pasteur establish the germ theory of disease
- Great risk of cross infection in hospitals
- Surgical procedures improved but what good are they against infectious disease?
- Drugs were largely ineffective before the 20th century
- Antibiotics and vaccines appeared in the 1930ies and 40ies. Decline in the infectious disease took place before.

- Mortality from infectious diseases in the 19th century declined from :
- reduced contamination, better sanitation due to political will, public health efforts and
- greater acquired resistance to infections due to improving living standards and economic conditions.

- “ it appears that the greatest proportion of the deaths occurred from... removable causes... The expense of public drainage, of supplies of water laid on in houses, and the removal of all refuse... would be a financial gain.. as it would reduce the cost of sickness and premature death." (Chadwick, *The Sanitary Condition of the Laboring Population*, 1842.)



City life, mid 19th century



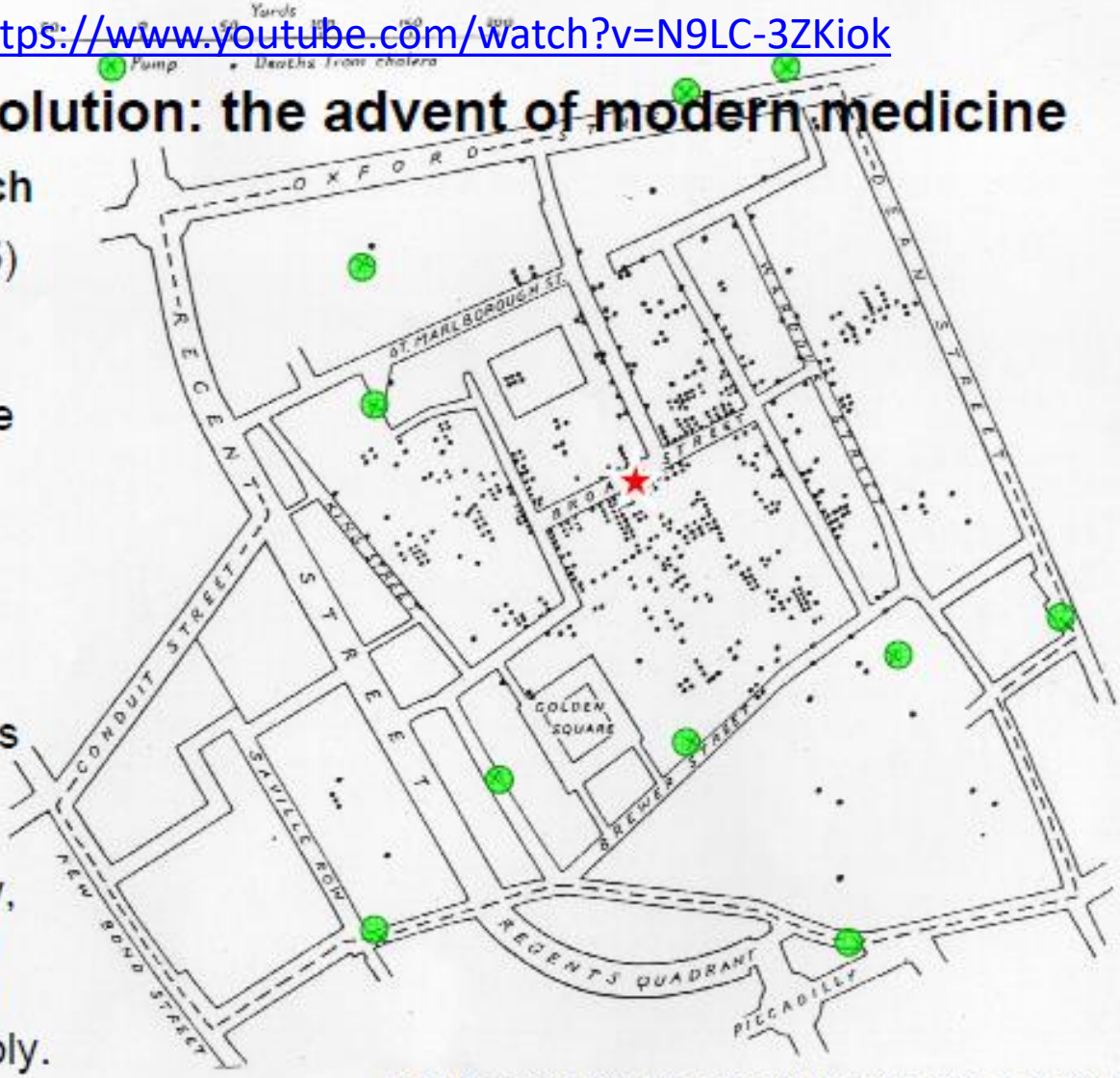
- **Public Health Act 1848**
- The establishment of a Central Board of Health
- **Taxes levied to pay for the improvements**
- Regulation of slaughterhouses, selling of meat, food safety
- Governmental Responsibility for water supplies and drainage
- All new residential construction to include running water and an internal drainage system.

https://www.youtube.com/watch?v=N9LC-3ZKiok

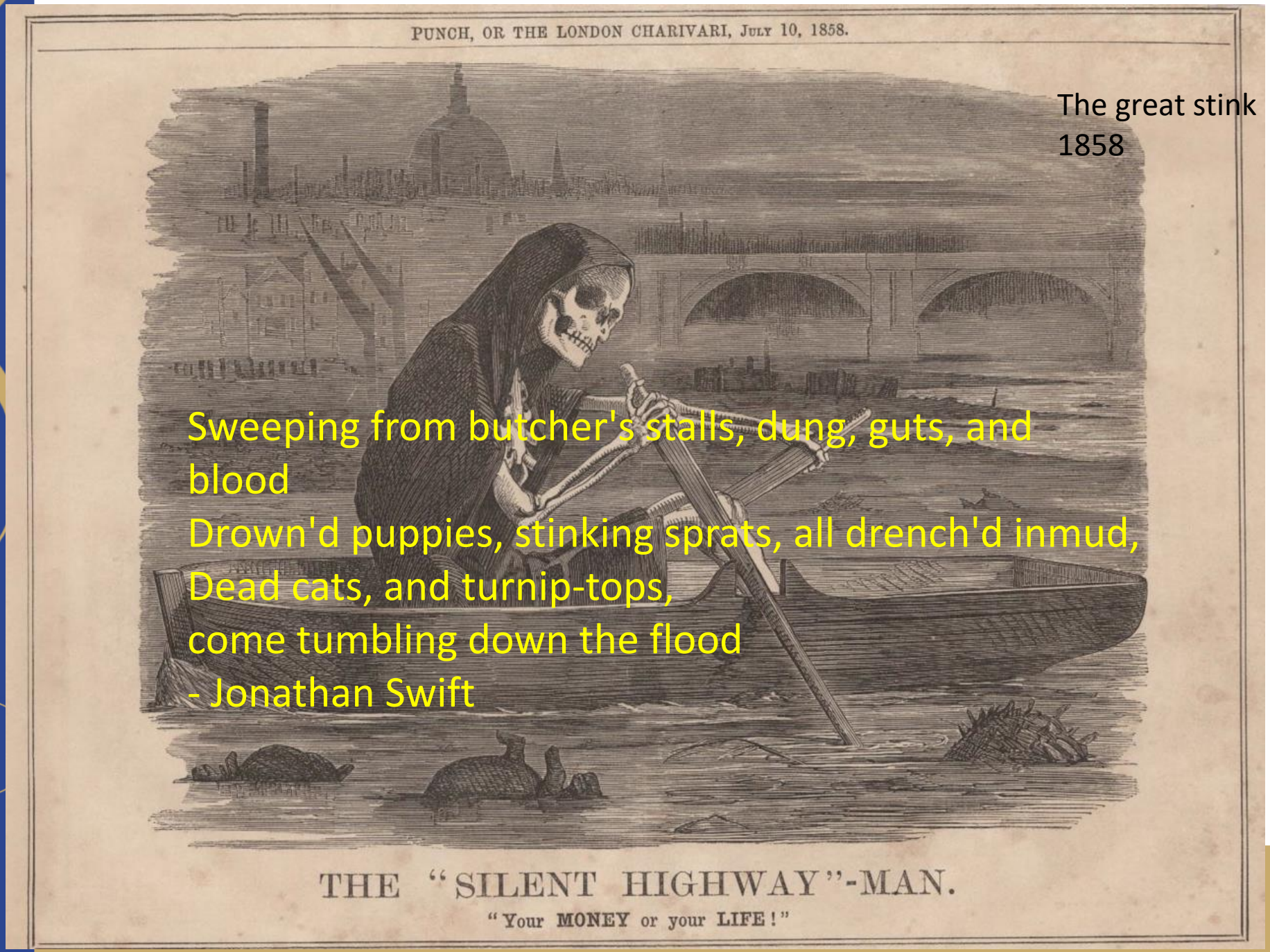
Industrial Revolution: the advent of modern medicine

Statistical approach

John Snow's (1855) famous map shows the cluster of cases around the water pump in Broad Street in London which resulted in 500 deaths in 10 days. Once the pump was disabled, the epidemic receded almost immediately, demonstrating that cholera was linked with the water supply.



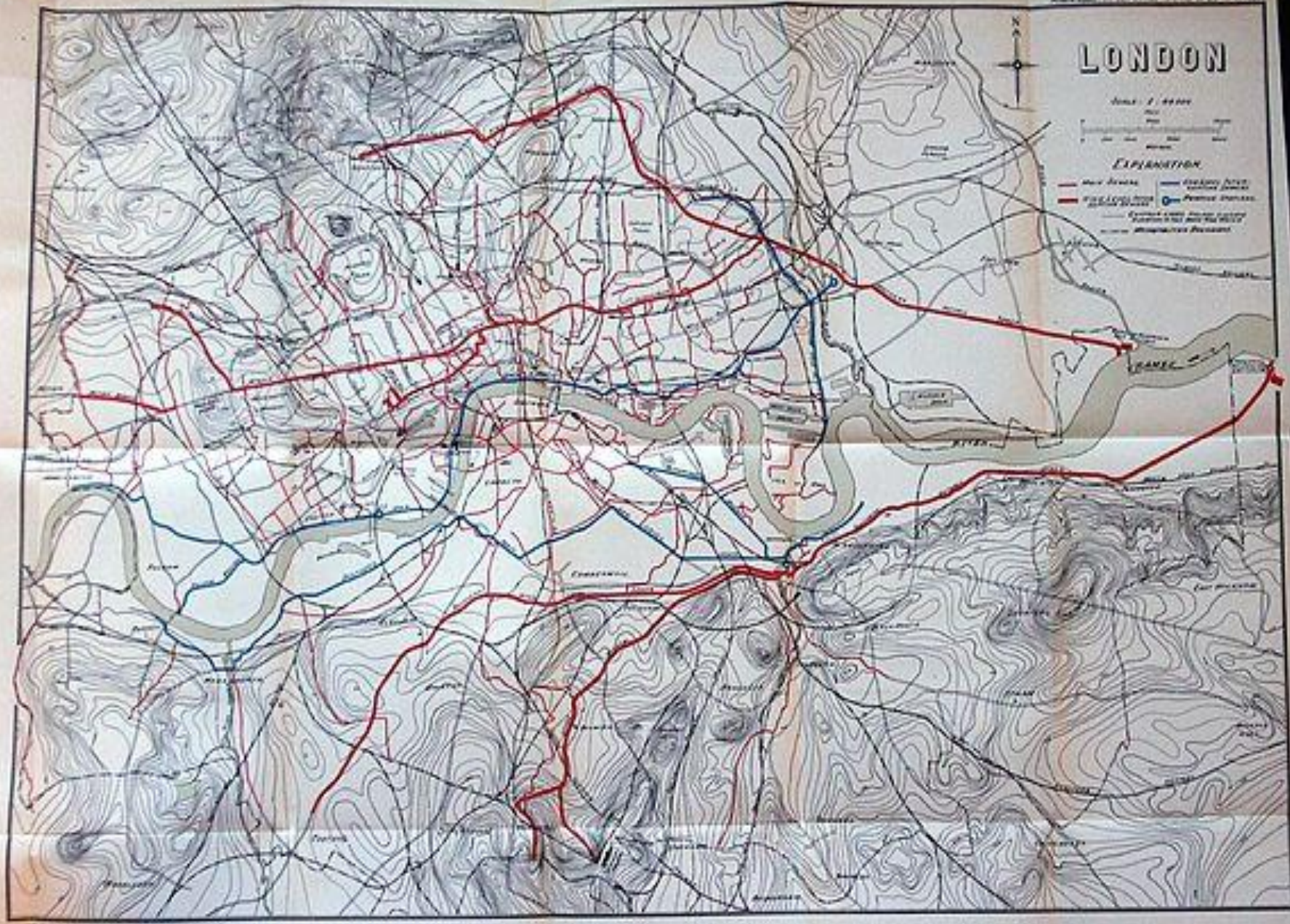
From *The Visual Display of Quantitative Data*, Edward R. Tufte



The great stink
1858

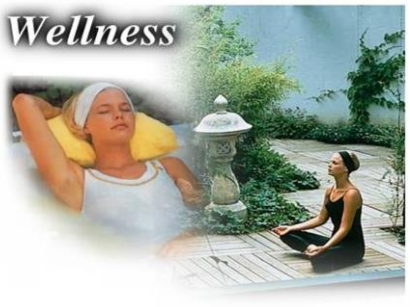
Sweeping from butcher's stalls, dung, guts, and blood
Drown'd puppies, stinking sprats, all drench'd inmud,
Dead cats, and turnip-tops,
come tumbling down the flood
- Jonathan Swift


Sir Joseph Bazallgette sewage constructionn1859-1865
POST OFFICE
© Getty Images

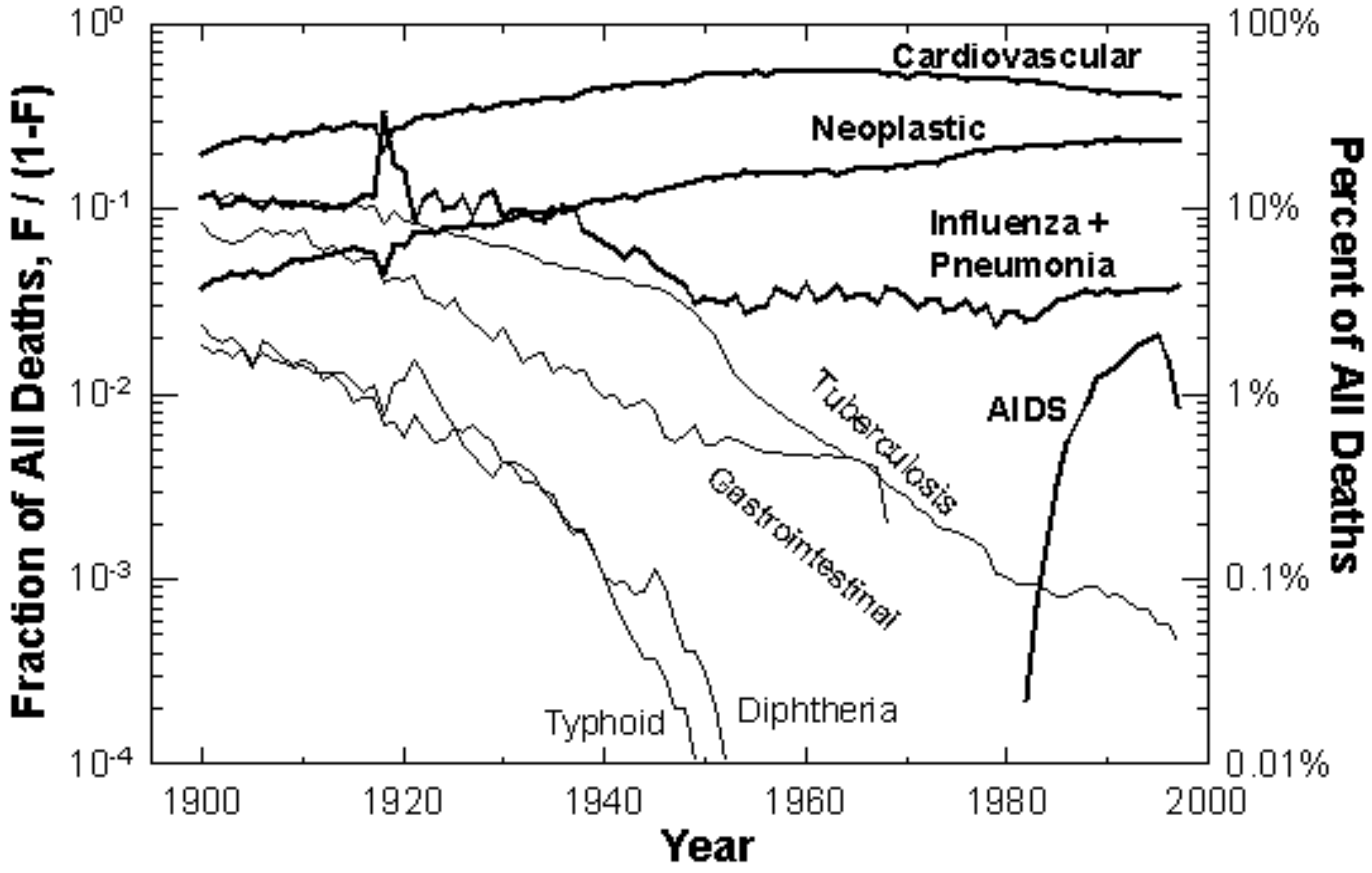

LONDON
EXPLANATION
THAMES

- Improved living and economic conditions lead to better resistance to disease
- Per capita GDP doubled between 1840-1880
- Education act of 1870- children 5-12 had to go to school.
- Fewer children were born, but much more survived due to better diets
- Better diet due to
- Higher income
- Better transport to cities- fresher food
- Refrigeration

- 3rd epidemiological period *The Age of Degenerative Diseases* 1945-1975
- Improved living standards, improved hygiene and scientific medicine, phamaceutical breakthroughs
- In the developed world it is degenerative chronic diseases (cancers, cardiovascular disorders) that dominate as cause of mortality
- Related to multiple risk factors not a single germ.
- Lifestyle, social and environmental factors are the most important cause
- Much better life expectancies (aprox 70 years)



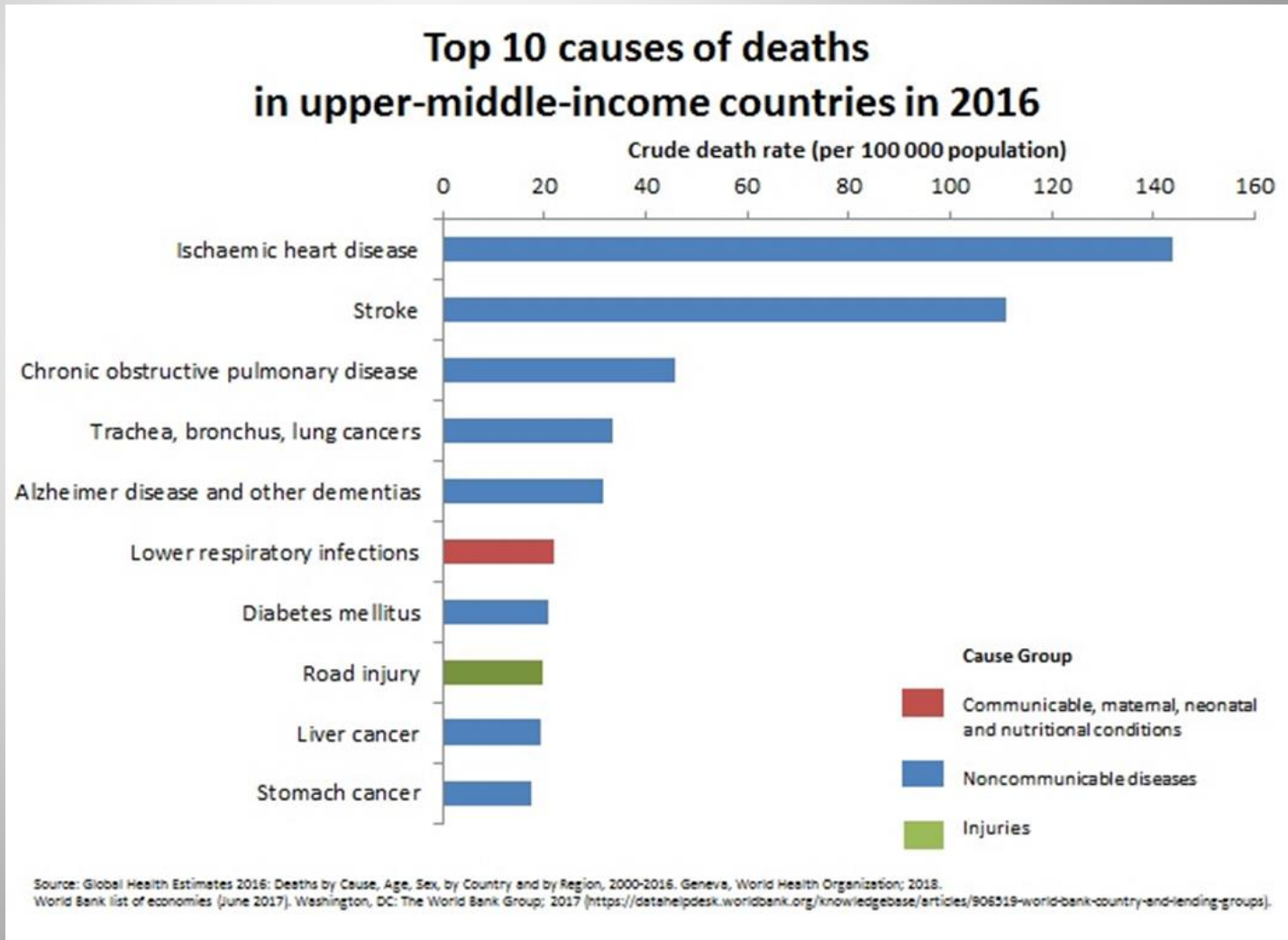
Trajectories of Eight Killers: U.S. 1900-1997. http://phe.rockefeller.edu/death/phedeath.pdf



- **4th epidemiological period age of delayed degenerative disease aprox. 1975 to today**
- The onset of degenerative illnesses, most importantly cardiovascular disease and cancer, starts later

More years spent in good health before illness/ death

Life expectancy in the early 80ies



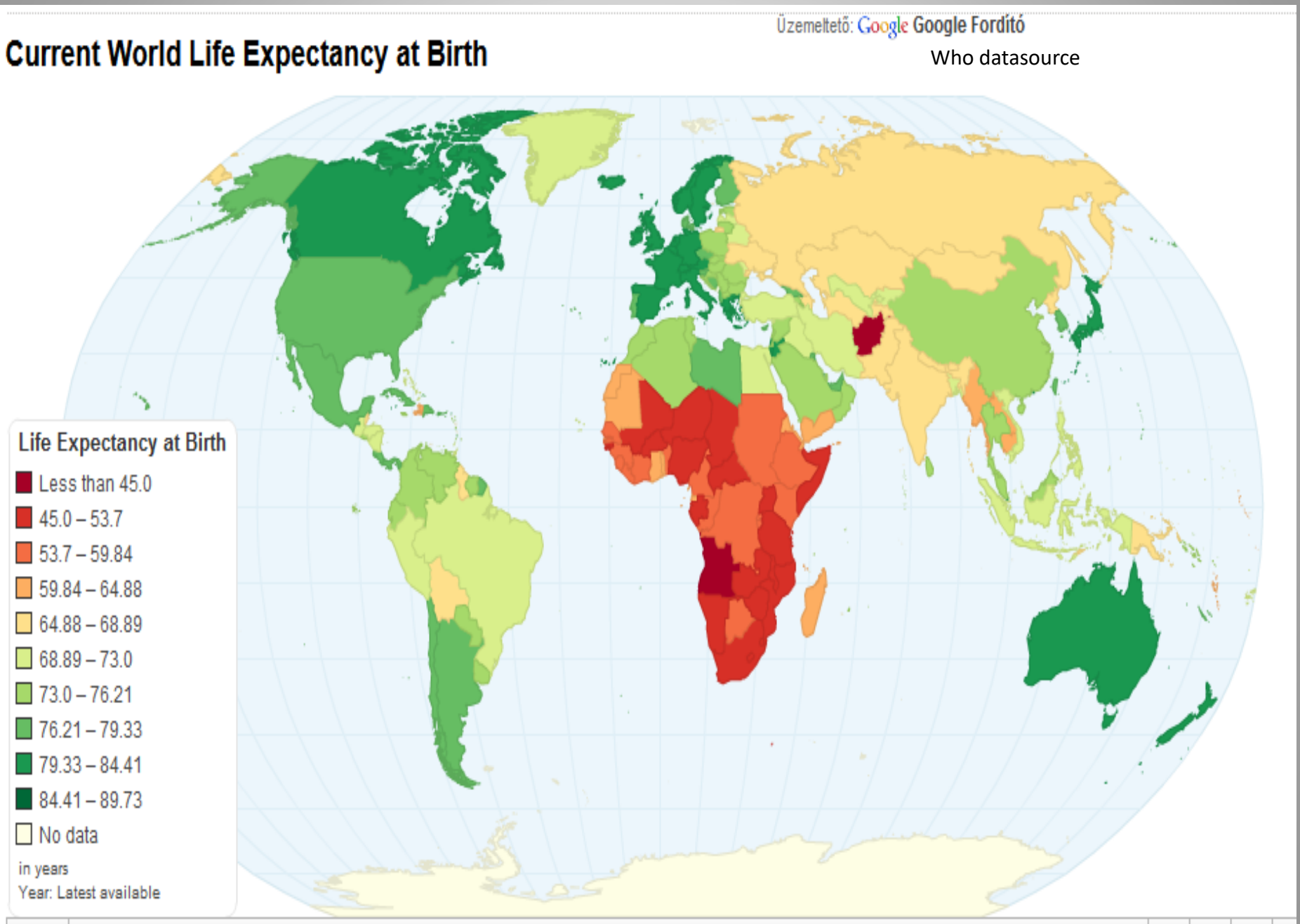
Epidemiological periods in the present

epidemiological periods	characteristics	Average life expectancy	Region
First period: pandemics	malnutrition and infectious disease	around 50 years	Sub-Saharan Africa
second period: endemics	Better nutrition, public health efforts, more people survive to die from chronic disease	50-60 years	Southern Asia, parts of Latin America
third period: chronic illness (non-infectious)	Increased smoking and alcohol consumption, unhealthy diets. Due to public health and reasonable standard of living, infectious disease is less important than chronic	60-75 years	Eastern Europe, parts of Latin America, Parts of India, the Middle east
fourth period: delayed onset of degenerative conditions,	Healthier lifestyle and social conditions than in regions with the 4th period. Major causes of mortality are cancer and cardiovascular diseas	over 75 years	High income developed countries.

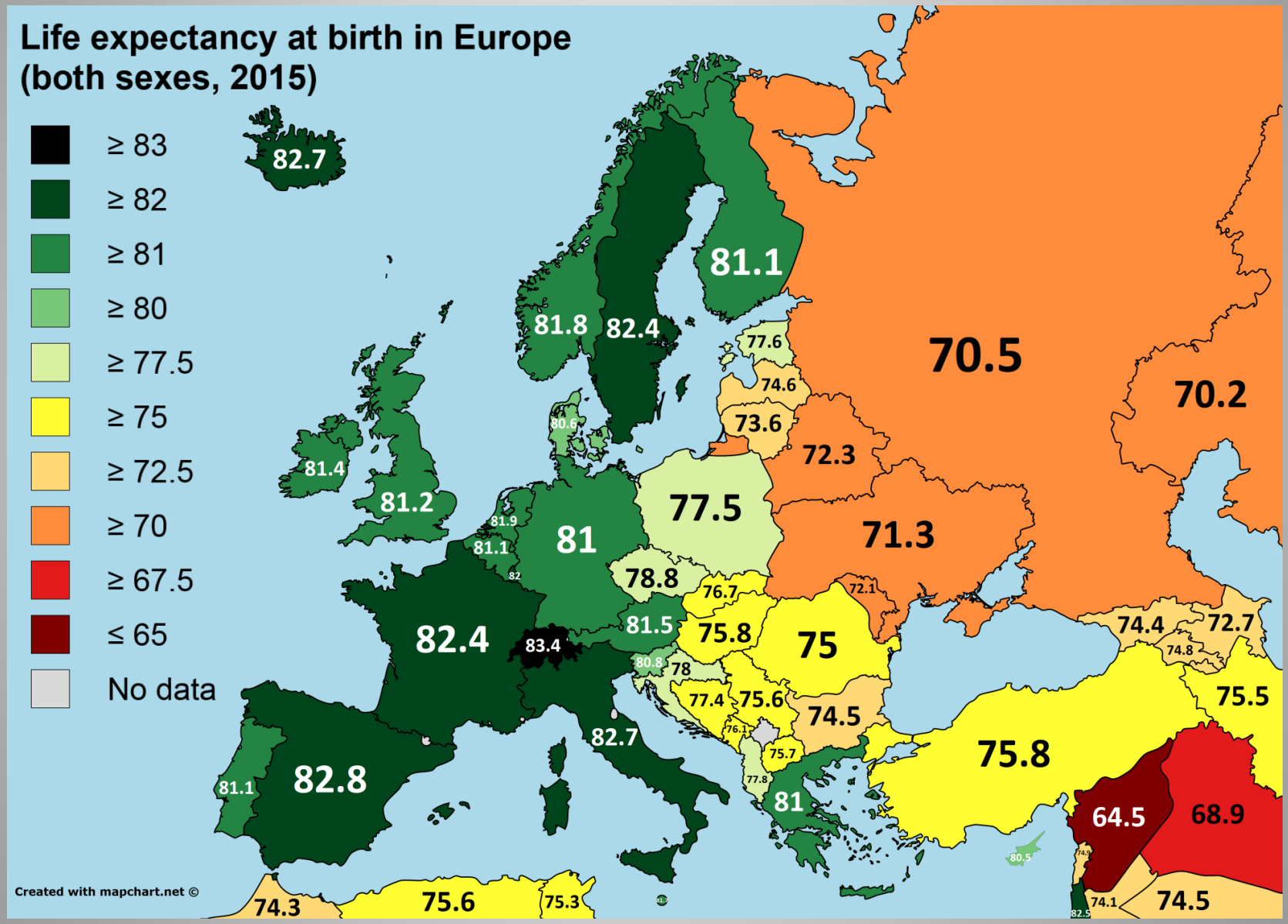
- There are health inequalities between countries

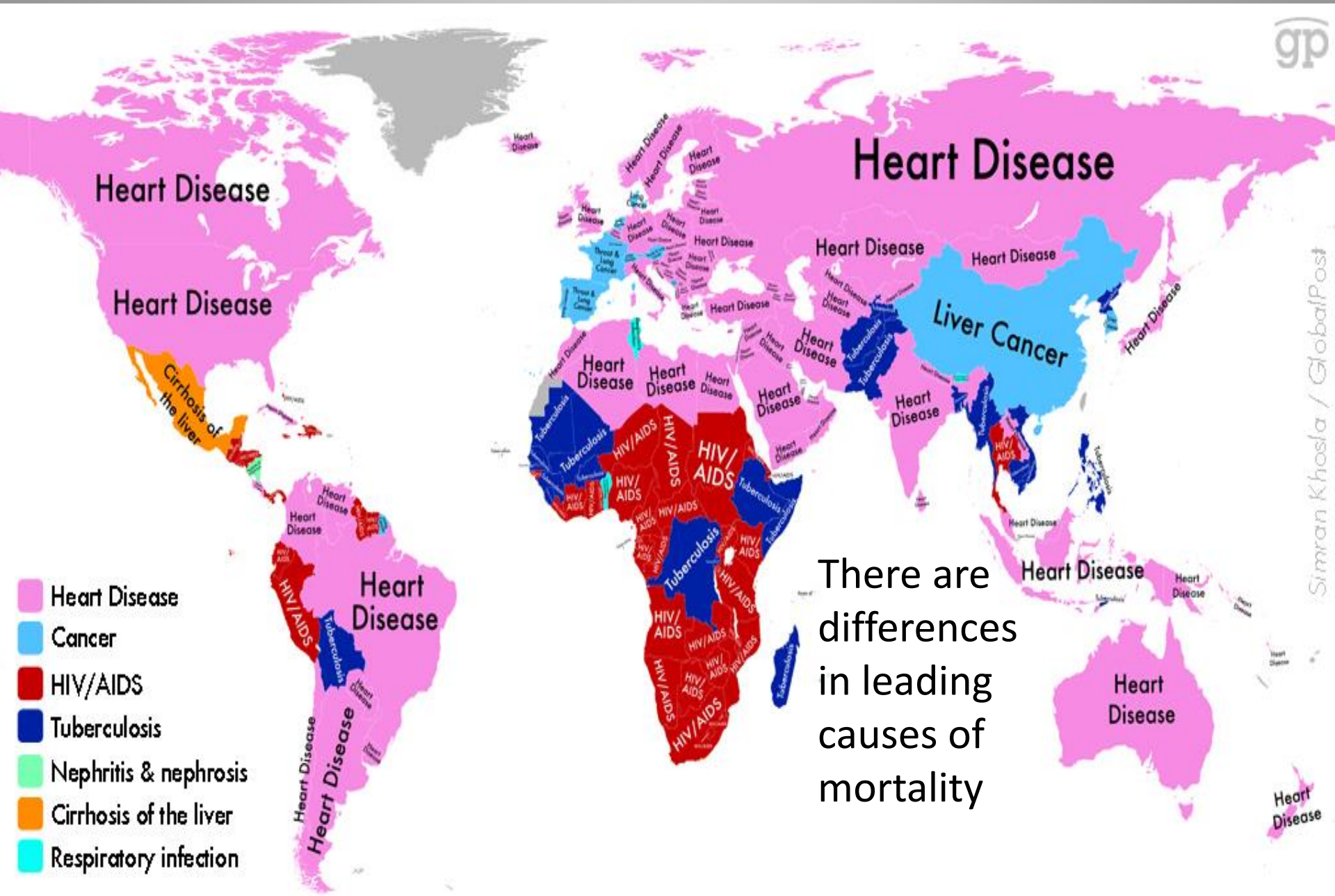
There are big differences in life expectancy at birth

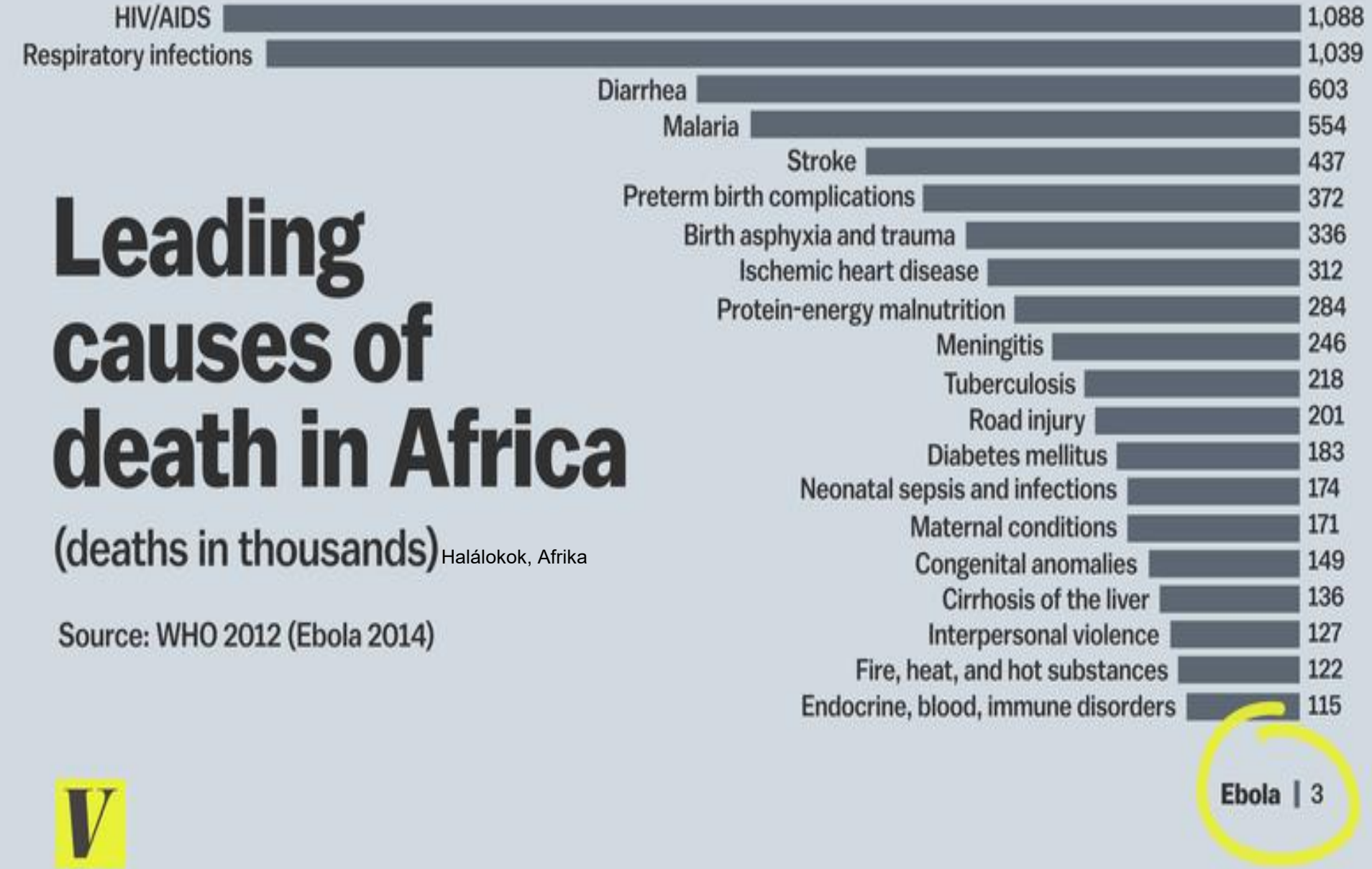
Who datasource



What are the patterns?




Heart Disease
Cancer
HIV/AIDS
Tuberculosis
Nephritis & nephrosis
Cirrhosis of the liver
Respiratory infection
There are differences in leading causes of mortality
Simran Khosla / GlobalPost



Halálokok, Afrika

- Low resistance from undernourishment and food poverty

- **Hunger Statistics- WHO food programme**
- Some 795 million people in the world do not have enough food to lead a healthy active life. That's about one in nine people on earth.
- The vast majority of the world's hungry people live in developing countries, where 12.9 percent of the population is undernourished.
- In Sub-Saharan Africa one person in four is undernourished.
- Poor nutrition causes nearly half (45%) of deaths in children under five - 3.1 million children each year.
- One in four of the world's children are stunted.
- **Many hungry people live in countries with food surpluses, not food shortages.**


https://worldpoverty.io/?fbclid=IwAR1cdt_EaBz8N9ddM73wcoRwKBNci9nh0TK346PSjTNRe4mKoKNb-Y_VV8k

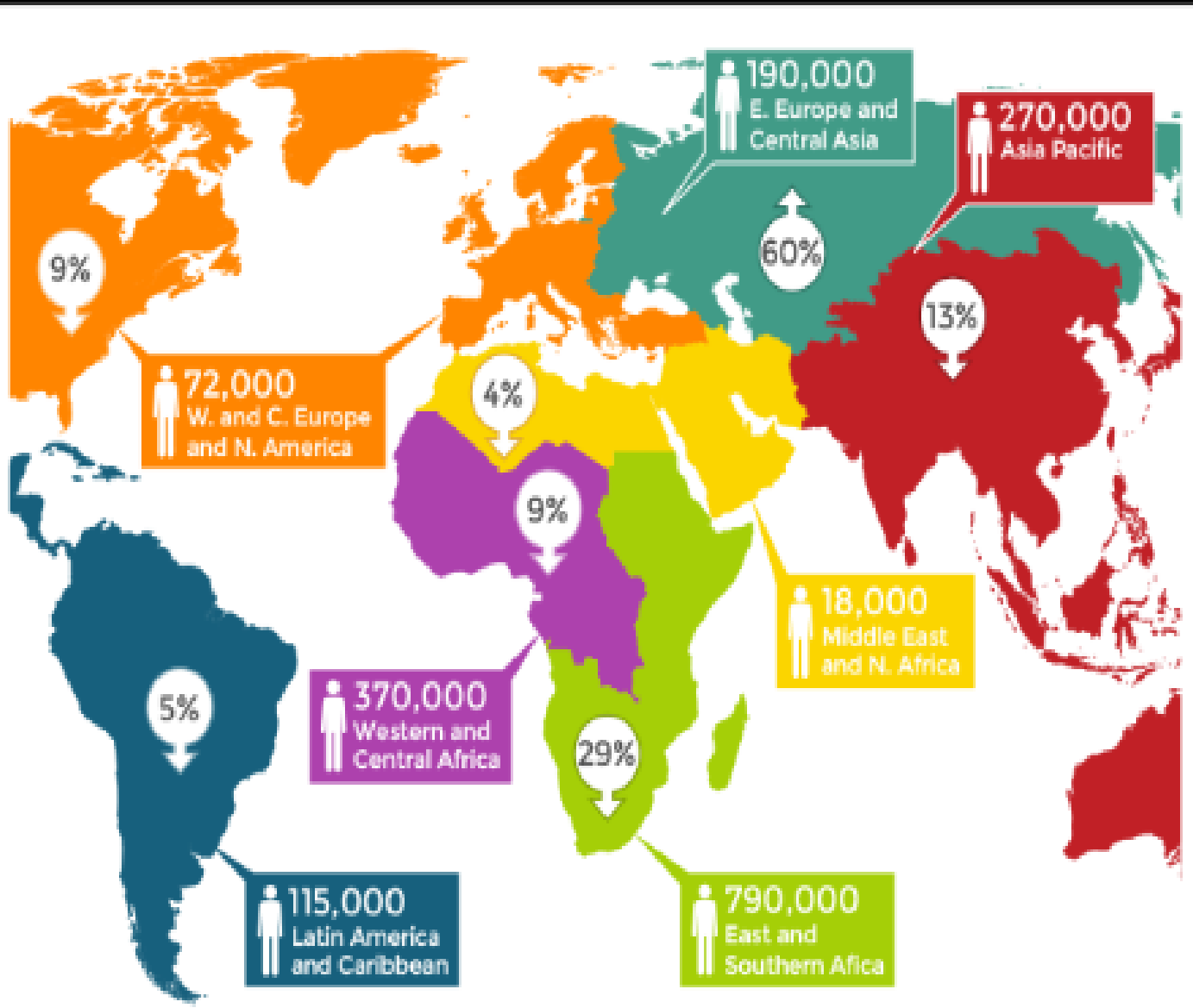
- HIV/ AIDS:

Number of new HIV infections in 2016 and change since 2010

1.8 million people newly infected in 2016 globally

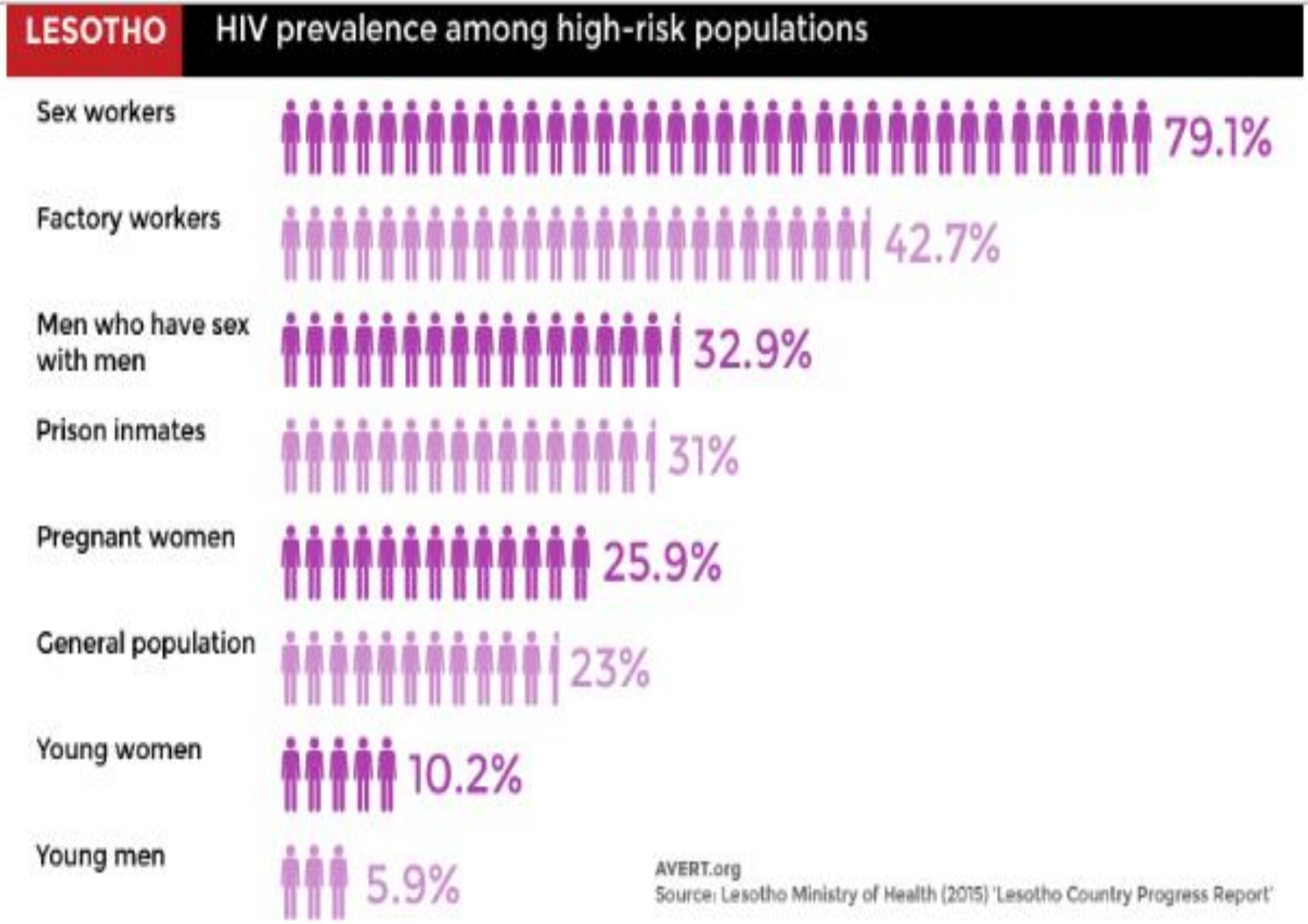
Decrease in number of new infections across the global population each year since 2010

16%



AVERT.org

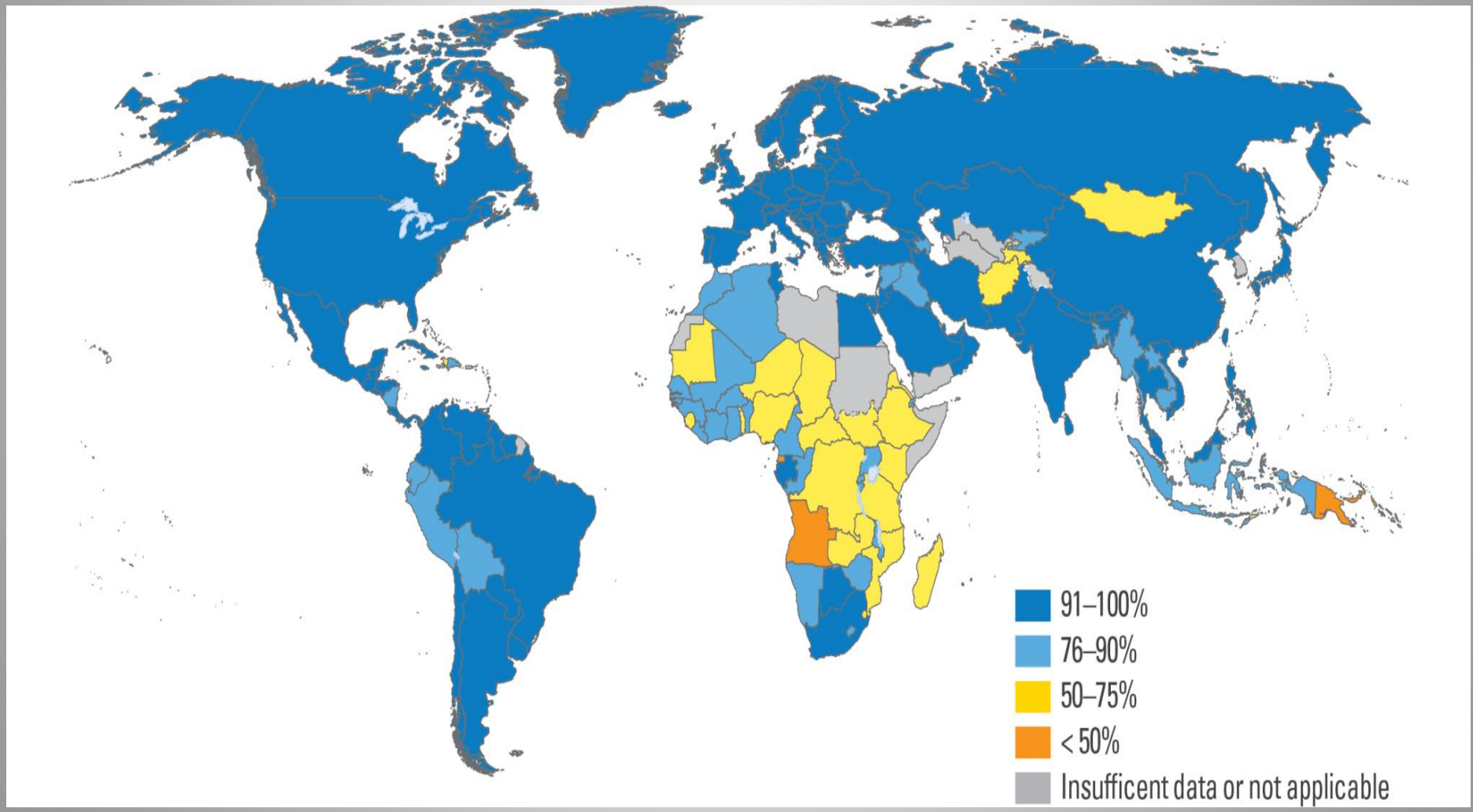
Source: UNAIDS Data 2017




Indoor smoke from solid fuels kills an estimated 1.6 million people annually due to respiratory diseases. (WHO DATA)

- Lack of clean water and sanitation

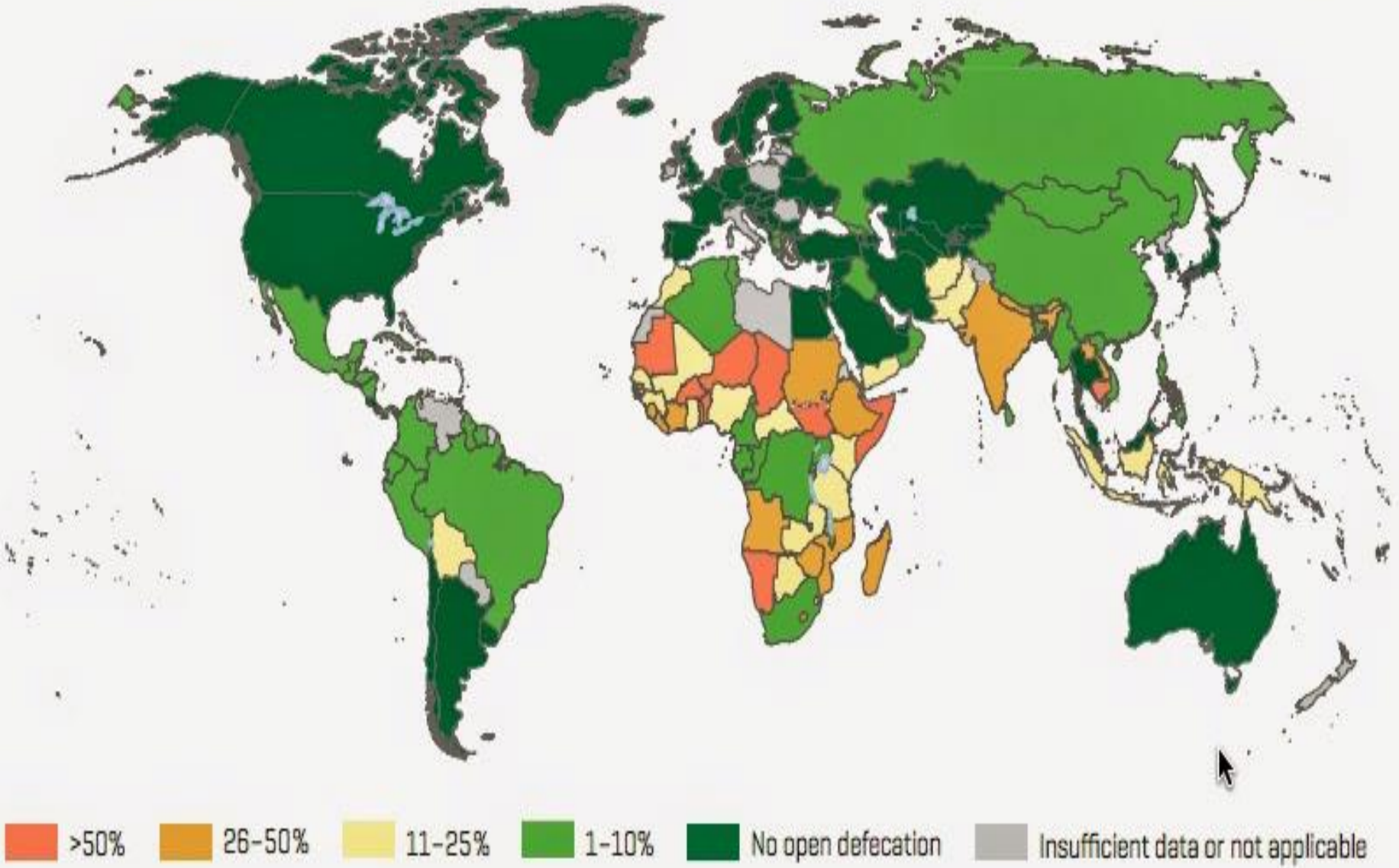
Access to clean drinking water




THE MILLENNIUM DEVELOPMENT GOALS (MDGs) ARE THE MOST SUCCESSFUL GLOBAL ANTI-POVERTY PUSH IN HISTORY.
AS WE APPROACH THE 2015 TARGET DATE OF THE MDGs, LET'S RALLY OUR WORLD TO AIM HIGHER AND STEP UP #MDGMOMENTUM
MDG7
ENSURE ENVIRONMENTAL SUSTAINABILITY
MORE THAN 2 BILLION PEOPLE GAINED ACCESS TO CLEAN DRINKING WATER SINCE 1990
LET'S STEP UP OUR EFFORTS
2.5 BILLION DO NOT HAVE BASIC SANITATION SUCH AS TOILETS OR LATRINES
SHARE #MDGMOMENTUM WITH YOUR COMMUNITY!
UN.ORG/MILLENNIUMGOALS


AFP/GETTY IMAGES

27 Countries have more than a quarter of the population still practising open defecation



Countries that account for almost three-quarters of the people who practice open defecation:

1. India (626 million)
2. Indonesia (63 million)
3. Pakistan (40 million)
4. Ethiopia (38 million)
5. Nigeria (34 million)
6. Sudan (19 million)
7. Nepal (15 million)
8. China (14 million)
9. Niger (12 million)
10. Burkina Faso (9.7 million)
11. Mozambique (9.5 million)
12. Cambodia (8.6 million).

Note: All the information in this report is based on data available up to and including 2010.

Ending open defecation through cultural and structural changes

- Political will
- A focus on behavior change through incentives
- Sanitation solutions that offer a better value than open defecation
- Stronger public sector local service delivery systems

- https://play.kahoot.it/v2/?quizId=eca1063c-8897-4d6b-b433-9f753e019b27