

# Lecture 01

## What is Public Health?

General overview and introduction

Michal Koščík

# Public health

"the science and art of preventing disease", prolonging life and improving quality of life through organized efforts and informed choices of society, organizations, communities and individuals.

# Public Health as a Social Effort

## What the society should do:

- Make sure people do not get ill in the first place
- Make sure infectious diseases do not spread too quickly
- Make sure people have access to healthcare when needed

## What Individuals should do

- make responsible lifestyle choices

## What healthcare providers should do

- Organize health services in an efficient way
- Improve quality of healthcare

Public health as a school subject

# Traditional Central-European concept

- „preventive disciplines“
  - hygiene,
  - epidemiology,
  - microbiology
  - occupational medicine.

# Western European concept

## Health protection

- To protect the health of populations against communicable disease and environmental hazards

## Health improvement

- To instil key principles of population health and prevention in managing and preventing clinical conditions.

## Organization of health services

- To understand the framework within which health care is delivered

## Improving the quality of health services

- Improving the quality of health services

# Public health at Masaryk university

## Public health I – Epidemiology (1st semester)

- Basic Concepts
- Epidemiology
- Social medicine
- Fundamental research skills

## Public health II – Health protection (3rd semester)

- Population health
- Protection of health from  
environmental hazards

## Public health III – Health improvement (9th semester)

- Prevention of communicable diseases
- Public health promotion
- Nutrition
- Healthy lifestyle

## Public health IV – Management of healthcare (10th semester)

- Health law
- Health economics
- Management of quality



# Public Health at Masaryk university

- Lectures
  - This semester only on-line
  - Not compulsory
- Seminars
  - Attendance compulsory
  - Active participation and completion of tasks and assignments
- Final test
  - After each semester written test
- State exam
  - Synthetic state exam in your last year (6th year).



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Public Health as a combination of disciplines

# Social medicine

Analyzes the health situation in the society

- Population health

Assesses impacts of societal circumstances of the population health (health determinants)

- Biological
- Social (cultural)
- Environmental

The goal is healthier society overall

# Epidemiology

The study and analysis of the distribution (who, when, and where), patterns and determinants of health and disease conditions in defined populations

Basic skill and independent discipline

The goal is to understand how to identify disease outbreak and intervene

# Preventive medicine

## Primary prevention

- Health promotion

## Secondary prevention

- prevent an asymptomatic disease from progressing to symptomatic disease

## Tertiary prevention

- Reduce the damage caused by the disease

# Hygiene

## Practices to protect human health

- Desinfection
- Waste disposal
- Sanitization
- Sterilization
- Laundry safety
- Food safety

# Health policy

Health in all policies principle

Legislative, economic and actual  
measures taken to protect  
population health

On global, national and regional  
levels

# Health Management

Organisation of healthcare provider,

- to efficiently allocate sources within the institution,

The objective is quality and cost-efficiency

# Health Economics

Resources are limited in every society

Healthcare rationing

- using resources where they are needed the most

The objective is the „cost benefit“ of healthcare



# Health law

## Regulates behaviour of all actors

- Patients
- Physicians
- Institutions
- Insurance companies

## The objective

- functioning and transparent system and respect to individual rights of a patient

# Public health

## Collective effort of everyone

- Individual
- Political
- Institutional

## Physician

- Has to understand the context in order to make informed decisions
- Has to be able to understand the system to collaborate

# Determinants of health

What keeps population healthy?

# Health

## WHO:

- state of complete physical, mental and social well-being and not merely the absence of disease or infirmity

## bio-medical model of health

- is body that operates efficiently just like a machine. Any breakdown in the body system means that the latter is not healthy
- Disease: set of signs and symptoms and medically diagnosed pathological abnormalities.
- Illness: how individuals experience disease.

## Socioecological model of health

- a wide range of factors that are individual, interpersonal, organizational, social, environmental, political, and economic



# determinant

/di'tɜːmɪnənt/

See definitions in:

All

Biology

Mathematics

*noun*

noun: **determinant**; plural noun: **determinants**

1. a factor which decisively affects the nature or outcome of something.  
"pure force of will was the main determinant of his success"
  - **BIOLOGY**  
a gene or other factor which determines the character and development of a cell or cells in an organism, a set of which forms an individual's idiosyncrasy.
2. **MATHEMATICS**  
a quantity obtained by the addition of products of the elements of a square matrix according to a given rule.

*adjective*

adjective: **determinant**

serving to determine or decide something.

Origin



early 17th century: from Latin *determinant*- 'determining', from the verb *determinare* (see [determine](#)).

# Major groups of health determinants

Biology and genetics

Physical determinants

Social determinants

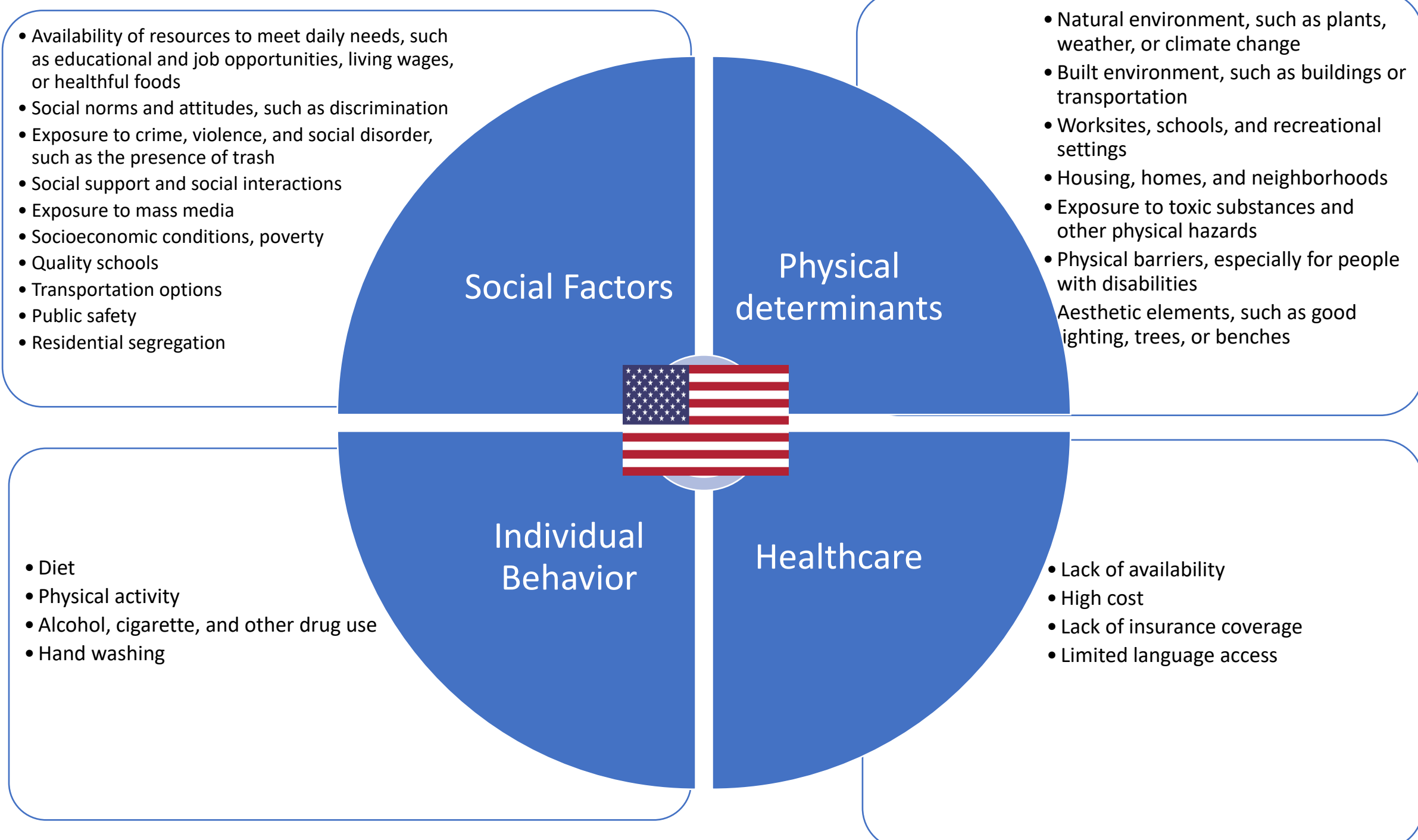
Health services

Public policies

Individual behaviour

# Taxonomy of health determinants

- Not universal
- Each country/region agency has its own terminology
- The concept of determinants is not contested and questioned



### Social Factors

- Availability of resources to meet daily needs, such as educational and job opportunities, living wages, or healthful foods
- Social norms and attitudes, such as discrimination
- Exposure to crime, violence, and social disorder, such as the presence of trash
- Social support and social interactions
- Exposure to mass media
- Socioeconomic conditions, poverty
- Quality schools
- Transportation options
- Public safety
- Residential segregation

### Physical determinants

- Natural environment, such as plants, weather, or climate change
- Built environment, such as buildings or transportation
- Worksites, schools, and recreational settings
- Housing, homes, and neighborhoods
- Exposure to toxic substances and other physical hazards
- Physical barriers, especially for people with disabilities
- Aesthetic elements, such as good lighting, trees, or benches

### Individual Behavior

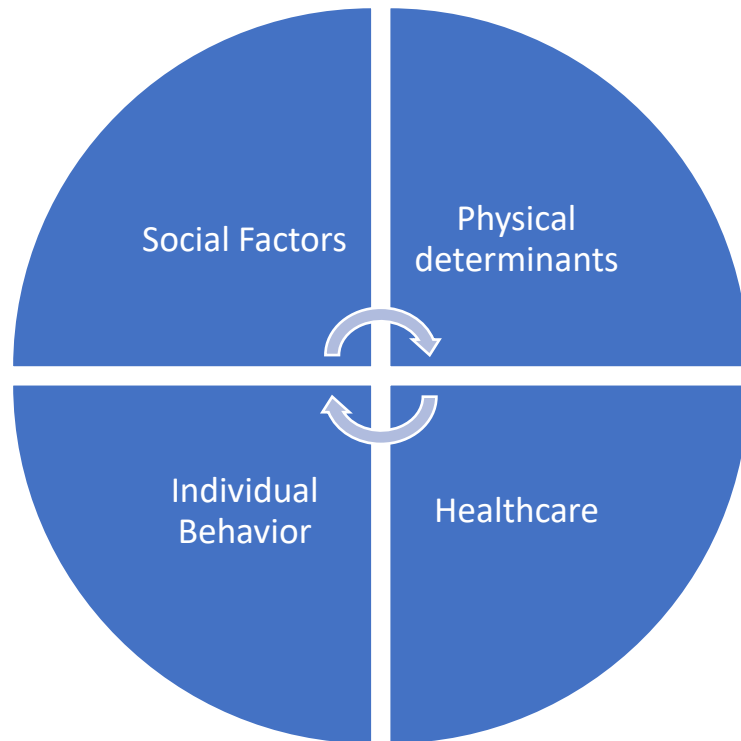
- Diet
- Physical activity
- Alcohol, cigarette, and other drug use
- Hand washing

### Healthcare

- Lack of availability
- High cost
- Lack of insurance coverage
- Limited language access



## USA (healthypeople.gov)



## CANADA (canada.ca/en/public-health)

Income and social status

Employment and working conditions

Education and literacy

Childhood experiences

Physical environments

Social supports and coping skills

Healthy behaviours

Access to health services

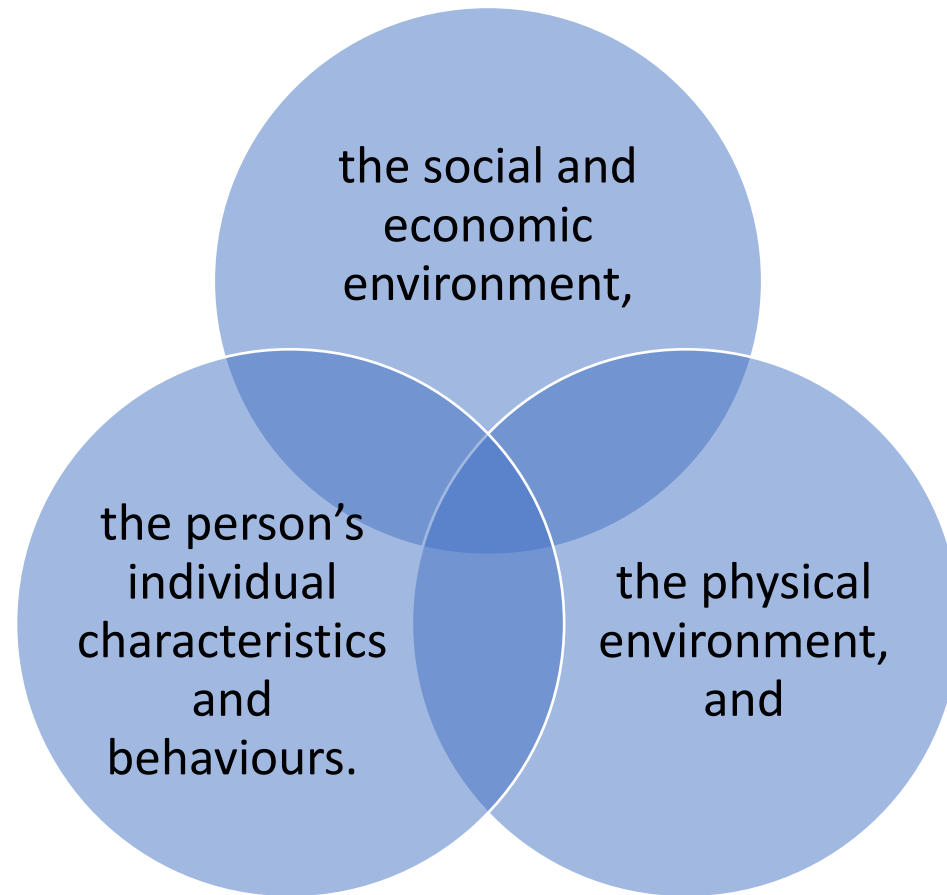
Biology and genetic endowment

Gender

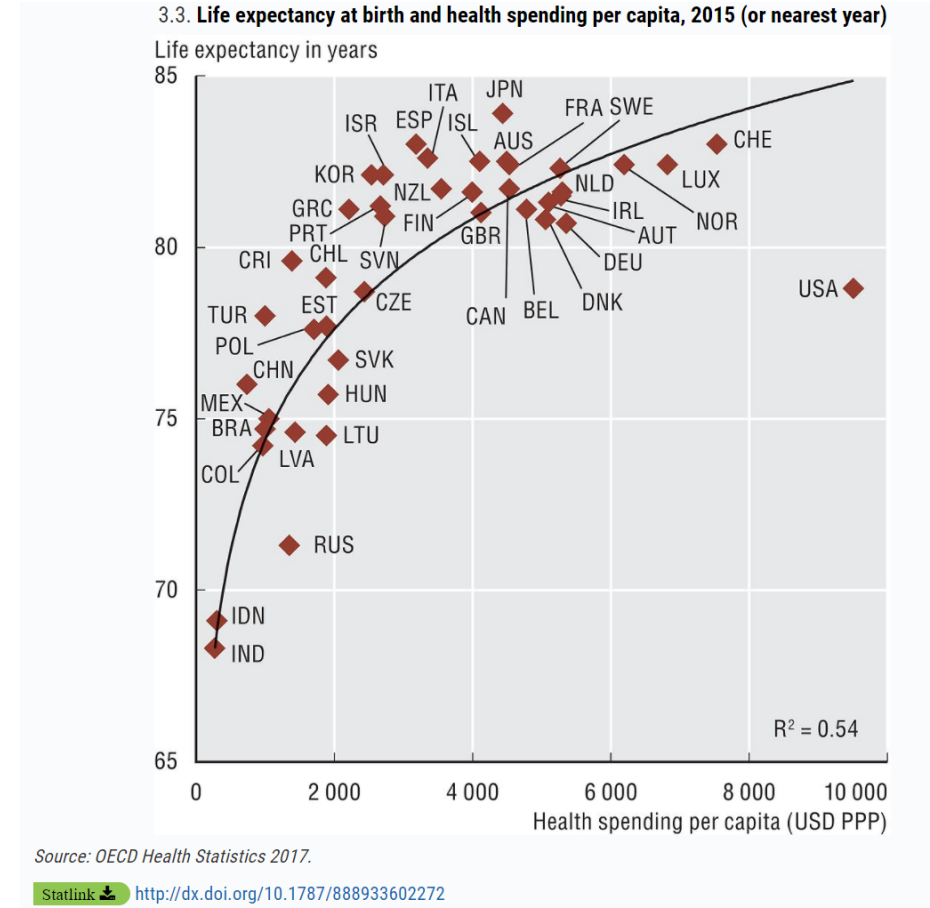
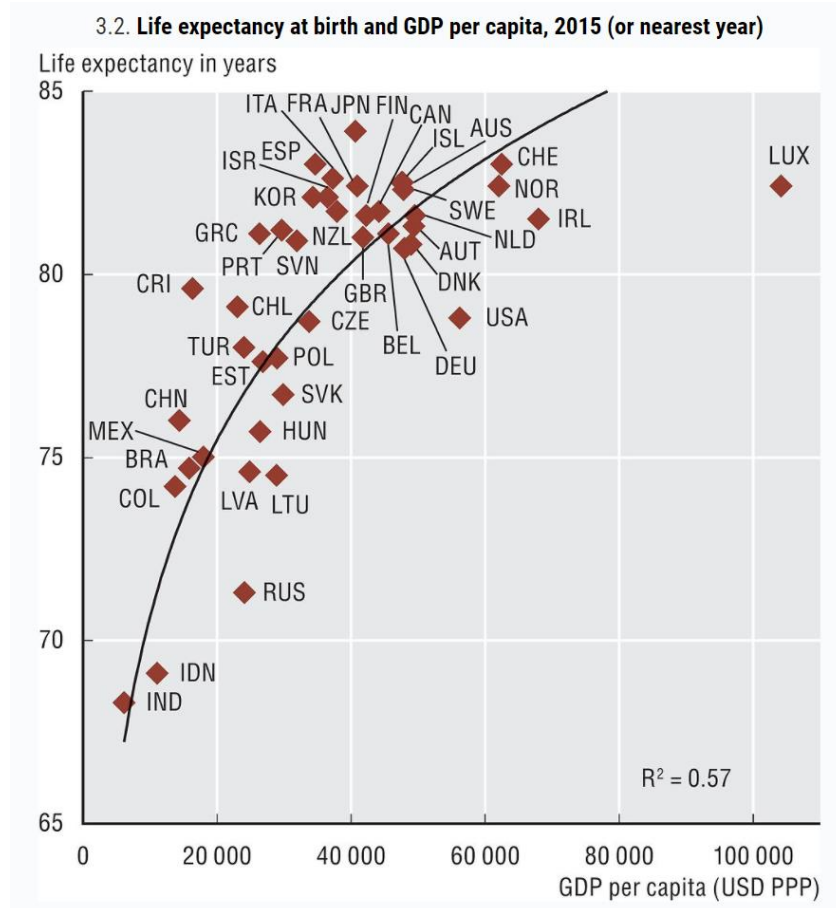
Culture

Race / Racism

# WHO taxonomy



# OECD Data



Source: OECD Health Statistics 2017.

Statlink <http://dx.doi.org/10.1787/888933602272>

# Social determinants of health in accordance to WHO

Income and social protection

Education

Unemployment and job security

Working life conditions

Food insecurity

Housing, basic amenities and the environment

Early childhood development

Social support and inclusion

Structural conflict

Access to affordable health services of decent quality.

# Social determinants of health (Holcik)

## Social gradient in health

- refers to the fact that inequalities in the population health status are related to inequalities in the social status.

## Stress

- Continuing anxiety, insecurity, low self-esteem, social isolation, and lack of control over work

## Early life

- Slow growth, emotional support, pregnancy, maternal stress,
- Lifestyle habits development

## Social exclusion

- unemployed, ethnic minority, guest workers, disabled people, refugees, and homeless people
- living on less than 60% of the national median income

## Work

- Income, social relationships
- Stress, working conditions

## Unemployment

- and the risk is higher in those regions where unemployment is widespread

## Social support

- emotional and practical resources they need

## Food

- Diet and food supply. Food safety

## Transport

- Cycling, walking, and the use of public transport promote health.
- They provide exercise, reduce fatal accidents, increase social contact, and reduce air pollution

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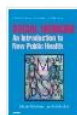
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1. SOCIAL MEDICINE



eBook

By: Čeledová, Libuše; Holčík, J. [S.I.] : Charles University in Prague, Karolinum Press. 2019. eBook., Database: eBook Collection (EBSCOhost)

Subjects: MEDICAL / Health Policy; MEDICAL / Health Care Delivery; SOCIAL SCIENCE / Disease & Health Issues; Health--Social aspects; Public health--Social aspects; Social medicine

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2. A new roadmap for social medicine curriculum design based on mixed methods student and faculty evaluations of the preclinical curriculum.



Academic Journal

(English) ; Abstract available. By: Finnie SM; Brach RJ; Dawson CA; Epstein SB; Goyal RK; Lounsbury KM; Eldakar-Hein ST; Lahey T, BMC medical education [BMC Med Educ], ISSN: 1472-6920, 2021 Aug 20; Vol. 21 (1), pp. 442; Publisher: BioMed Central; PMID: 34416885, Database: MEDLINE Complete PubMed

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## SOCIAL MEDICINE



Author: Čeledová, Libuše,  
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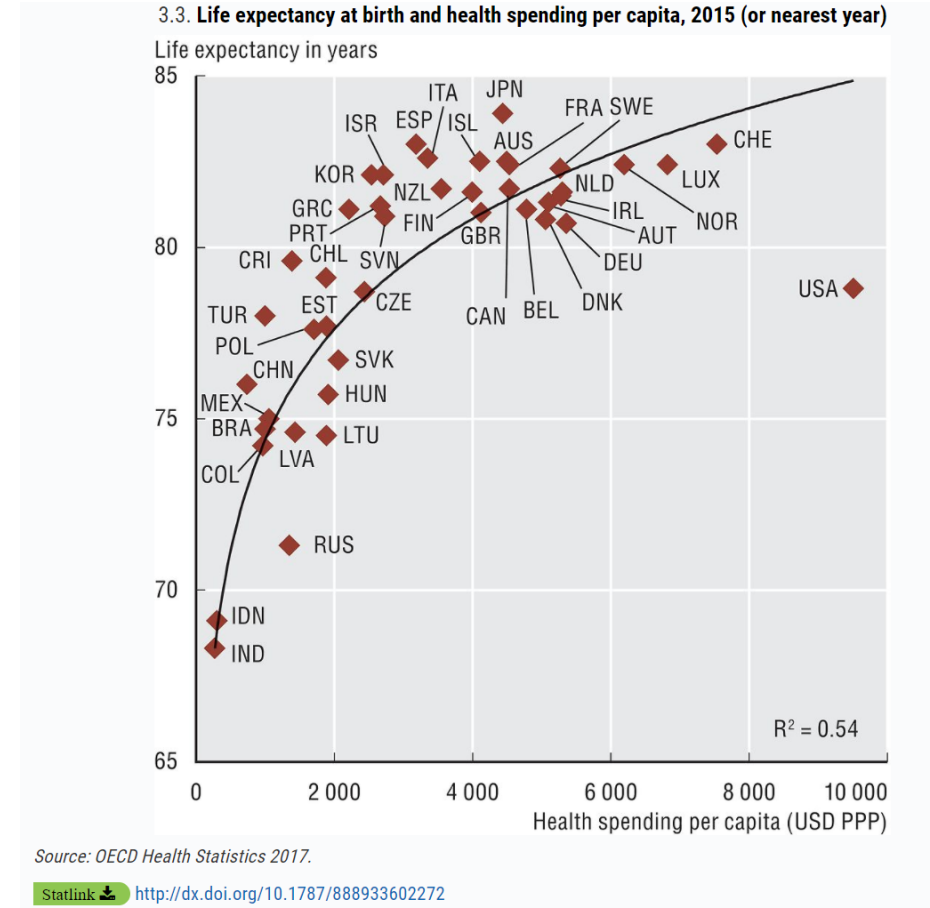
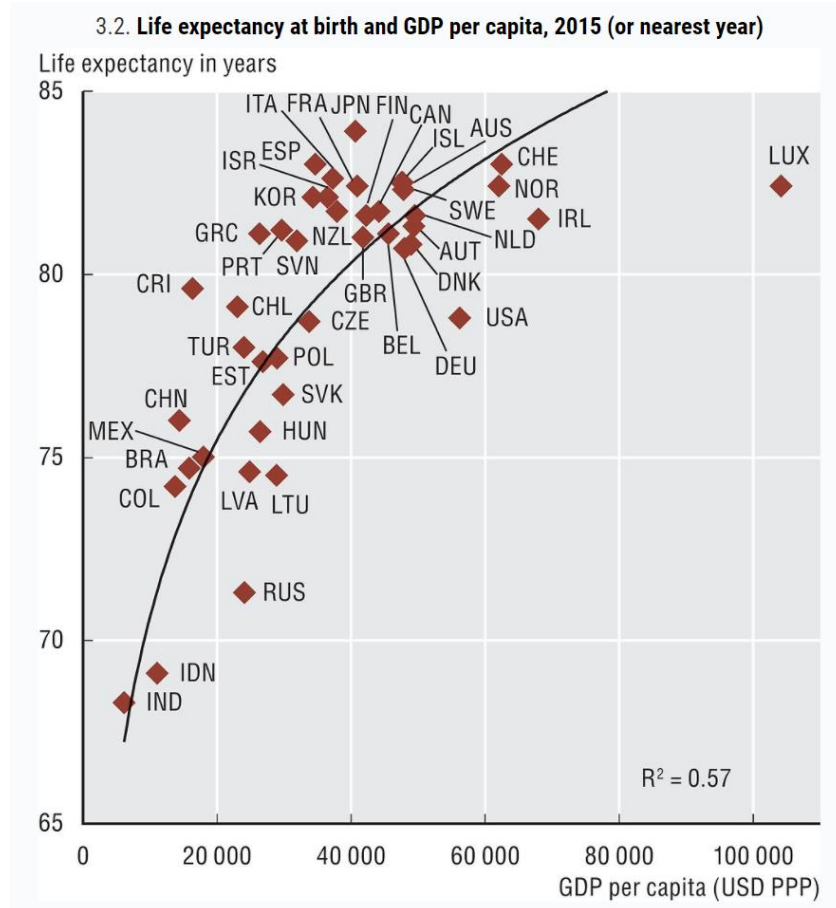


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# HEALTH INEQUALITIES

Between countries

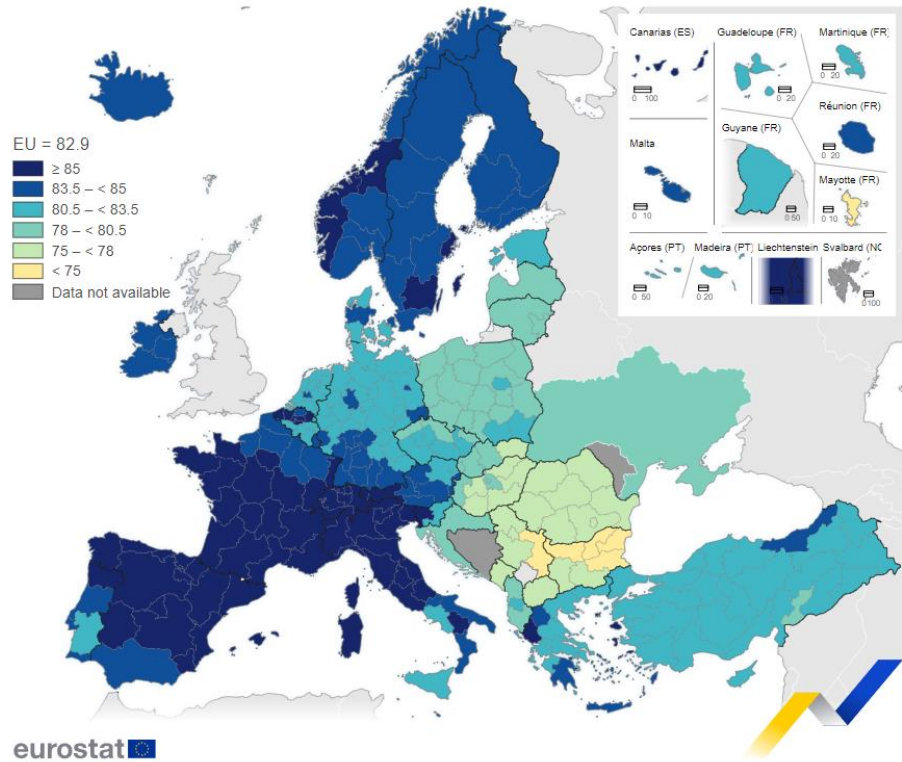
# OECD – The richer countries have better life expectancy



# Life expectancy

# VS average income

Life expectancy at birth for females, 2021  
(years, by NUTS 2 regions)

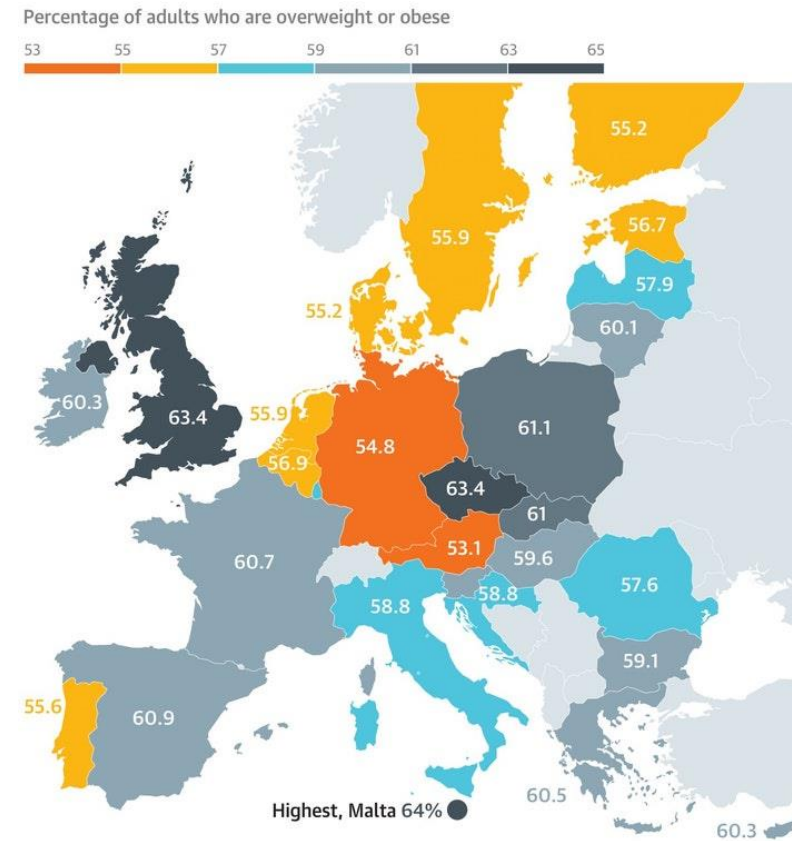


Note: Croatia, national data. Albania: 2020. Türkiye and Ukraine: 2019.  
Source: Eurostat (online data codes: demo\_r\_miflexp and demo\_mlexpec)

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
Cartography: Eurostat - IMAGE, 10/2023

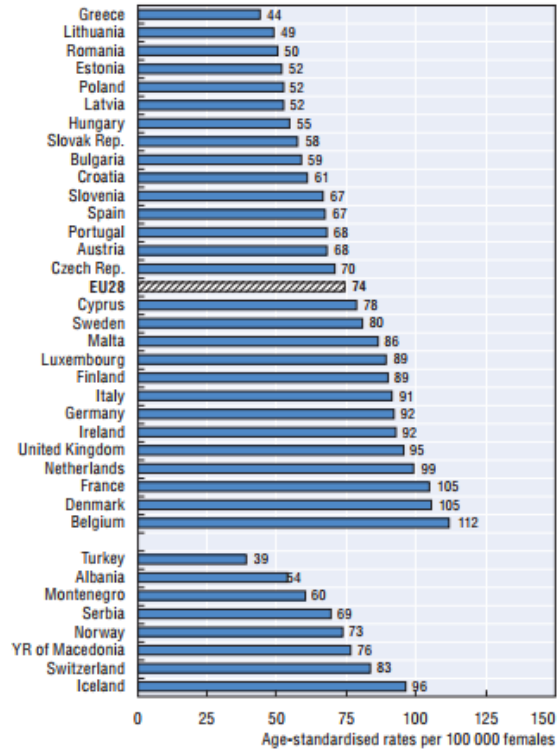


# Lifestyle differences

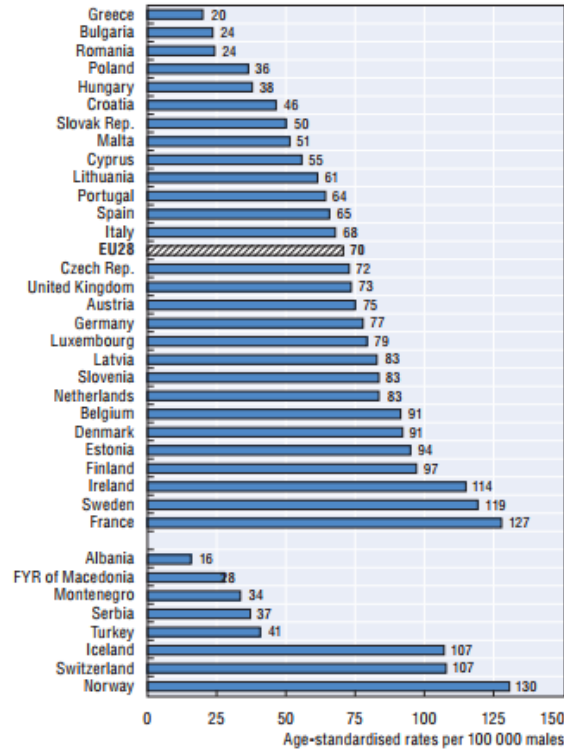


# Regional differences

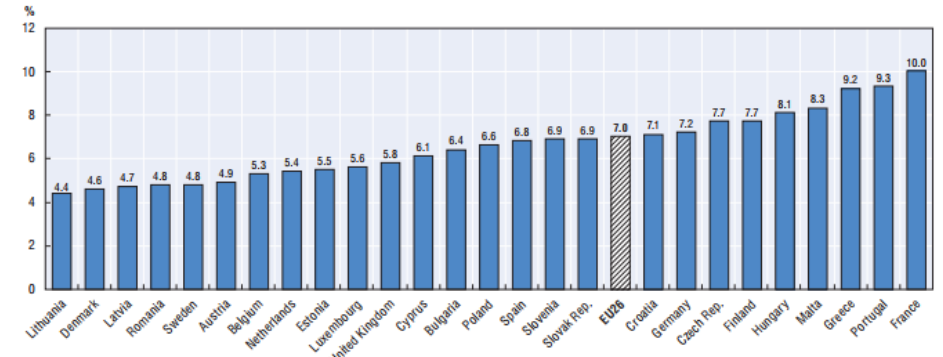
3.32. Breast cancer incidence rates, women, 2012



3.33. Prostate cancer incidence rates, men, 2012



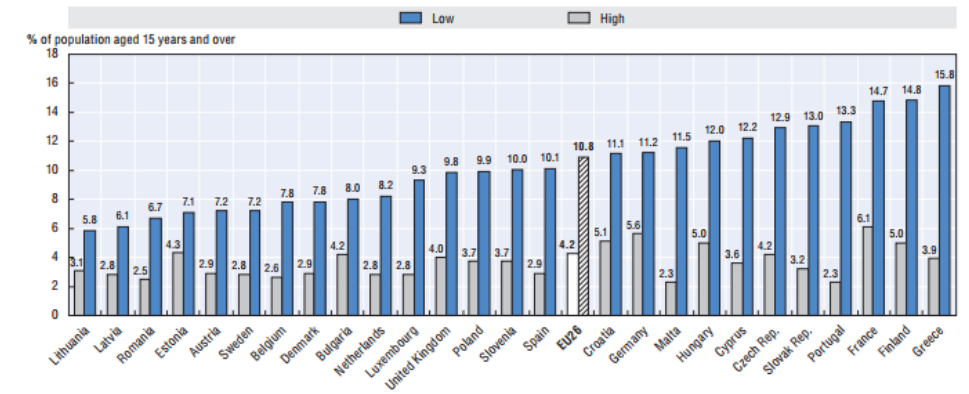
3.34. Self-reported diabetes, population aged 15 years and over, 2014 (or nearest year)



Source: Eurostat Database, based on Health Interview Surveys.

StatLink <http://dx.doi.org/10.1787/88893428845>

3.35. Self-reported diabetes by level of education, 2014 (or nearest year)



Source: Eurostat Database, based on Health Interview Surveys.

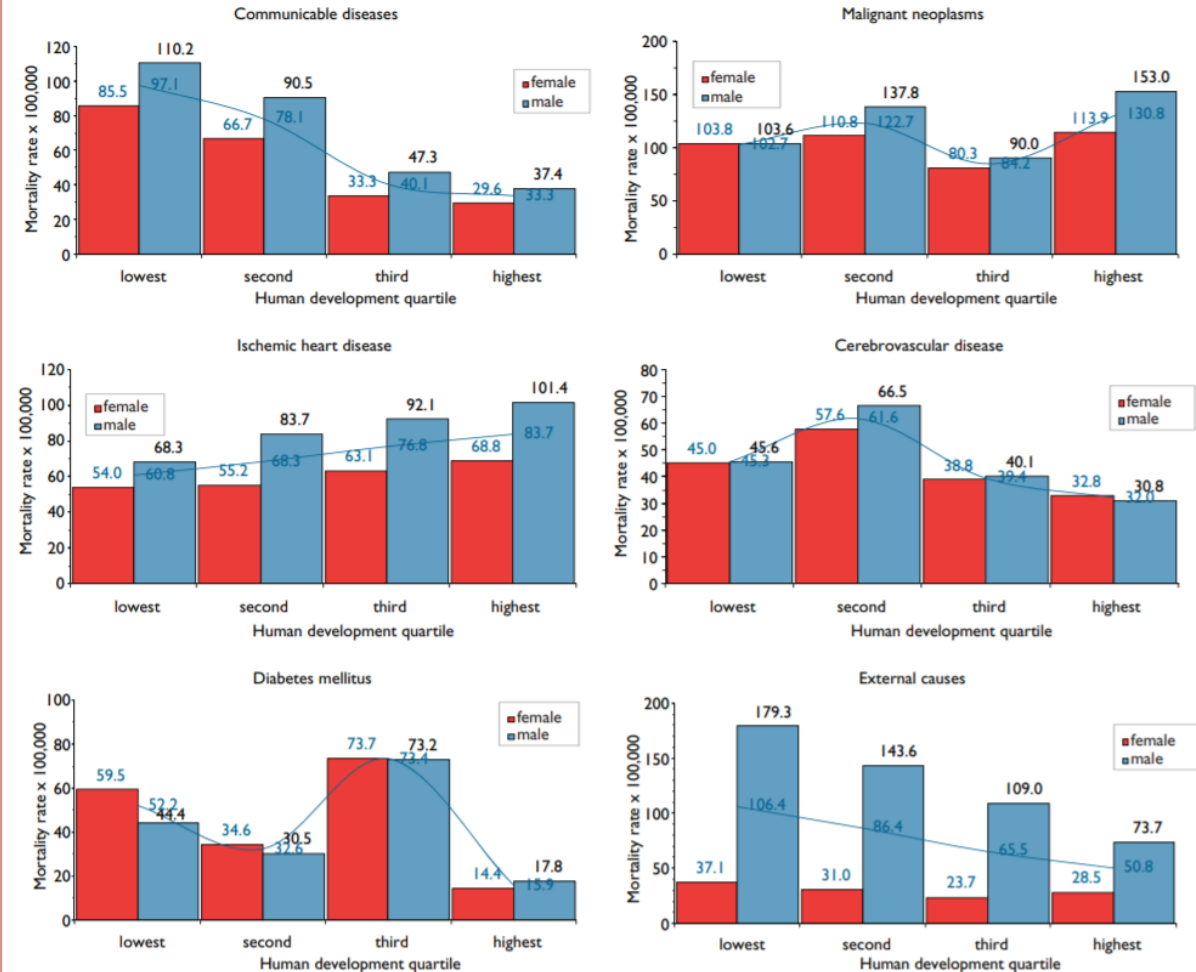
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# Health inequalities

Between people

# Social Gradient

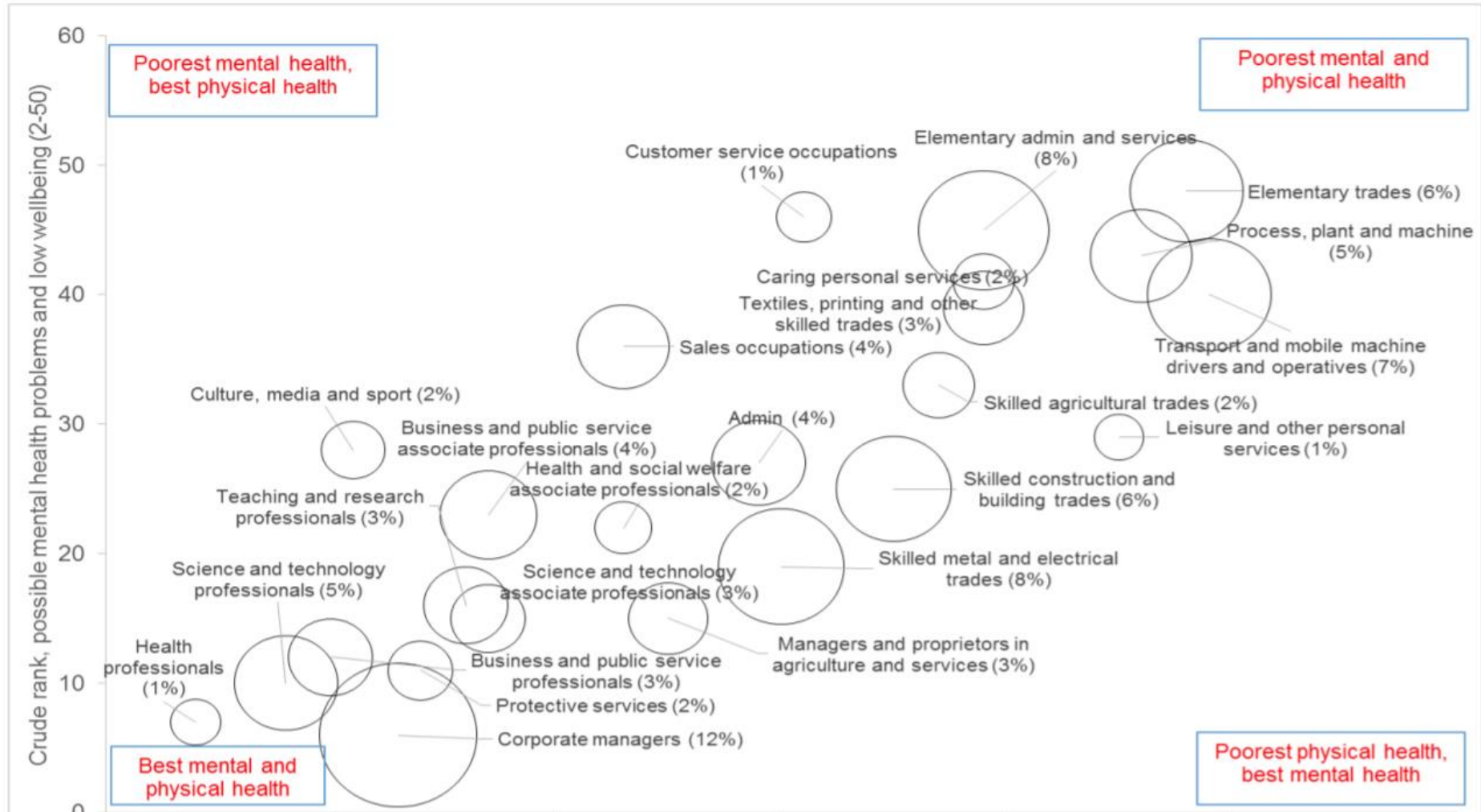
**FIGURE 2.17. Social gradients in cause-specific risks of death, as defined by quartiles of human development and gender, Region of the Americas, 2007–2009.**



Source: References (24, 45).

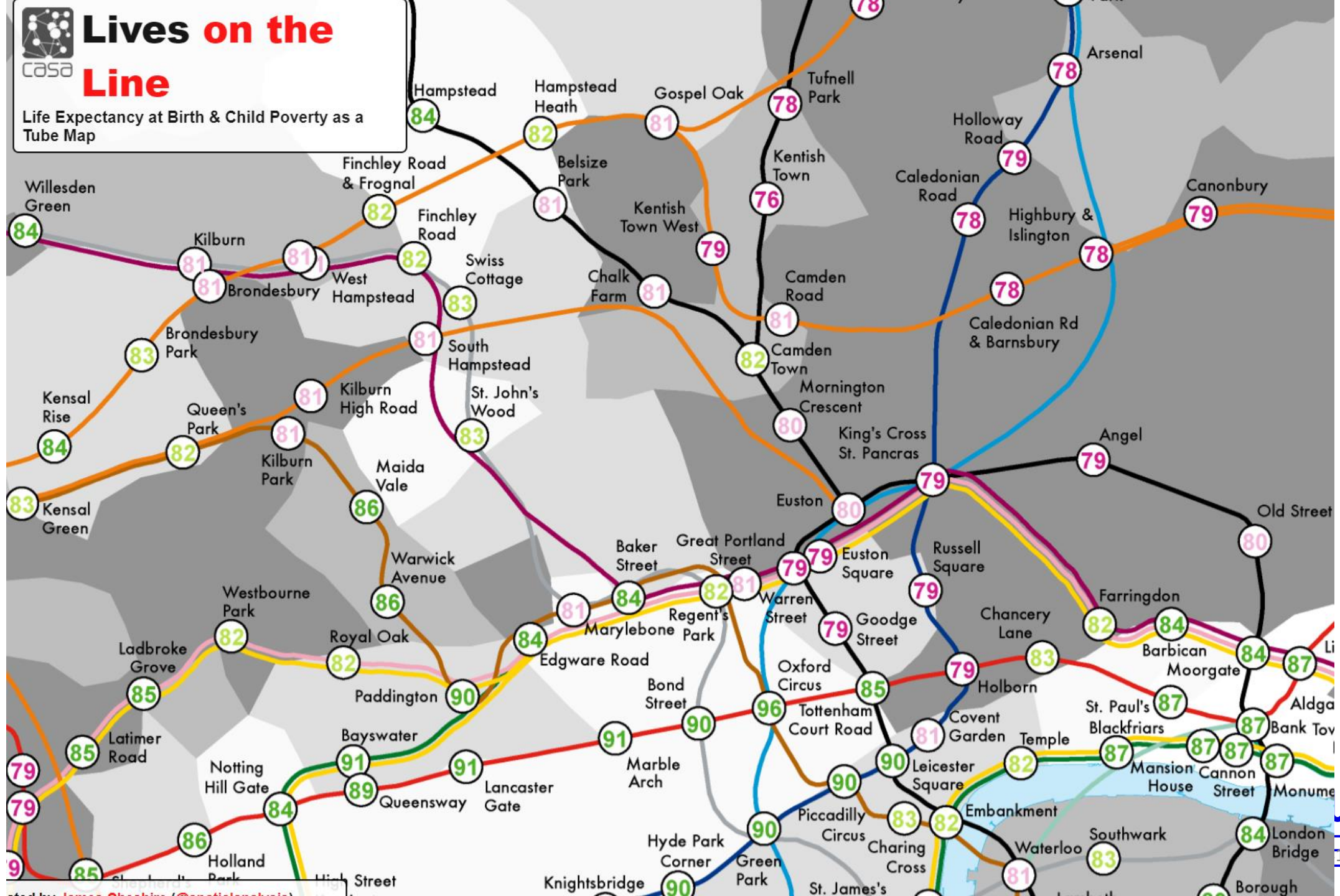
# Job (example)

**Figure 3:** Men aged 16–64 years, by current/last job SOC summary health outcomes: Scotland, 2008–2011.



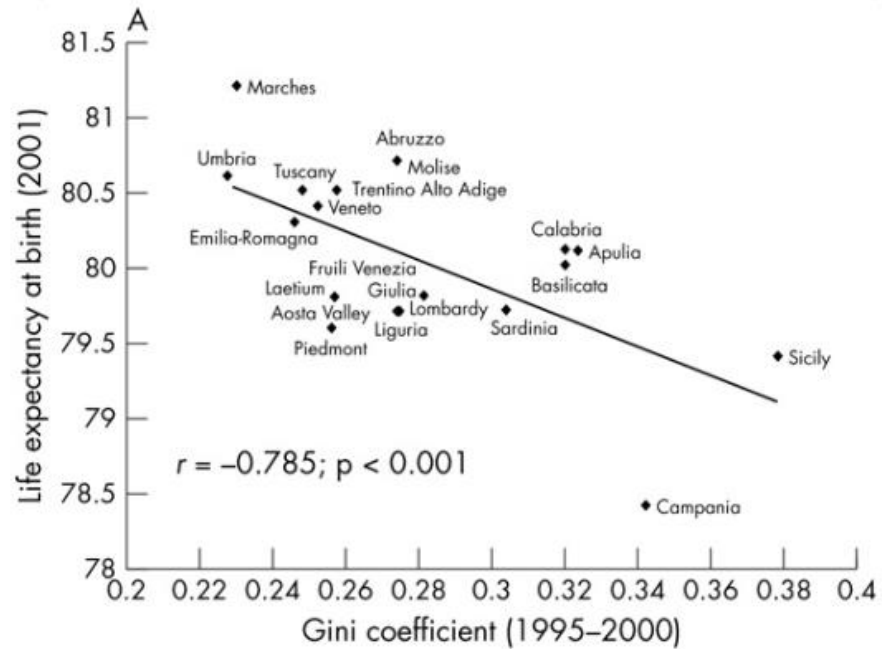


 **Lives on the Line**  
 Life Expectancy at Birth & Child Poverty as a Tube Map



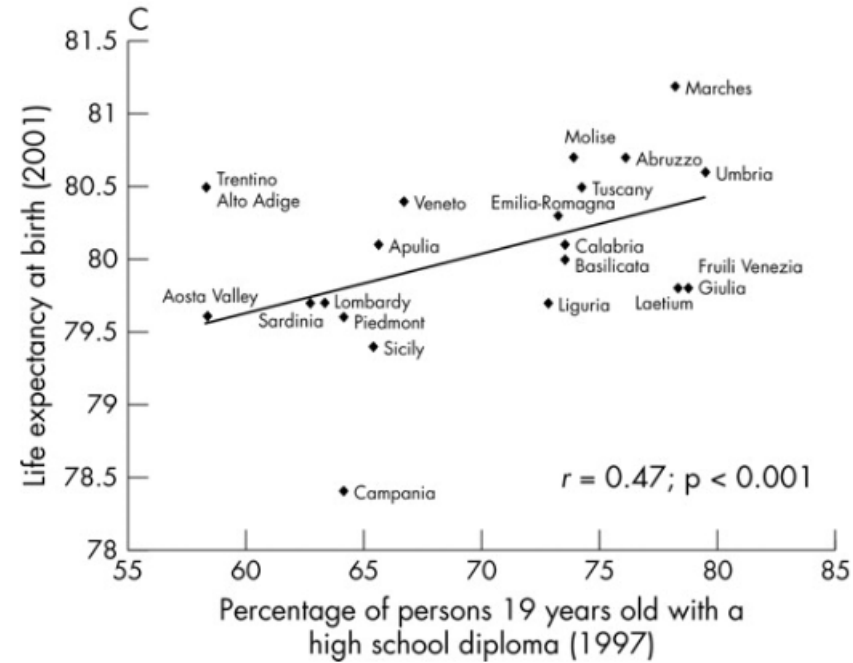
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# A few examples from Italy

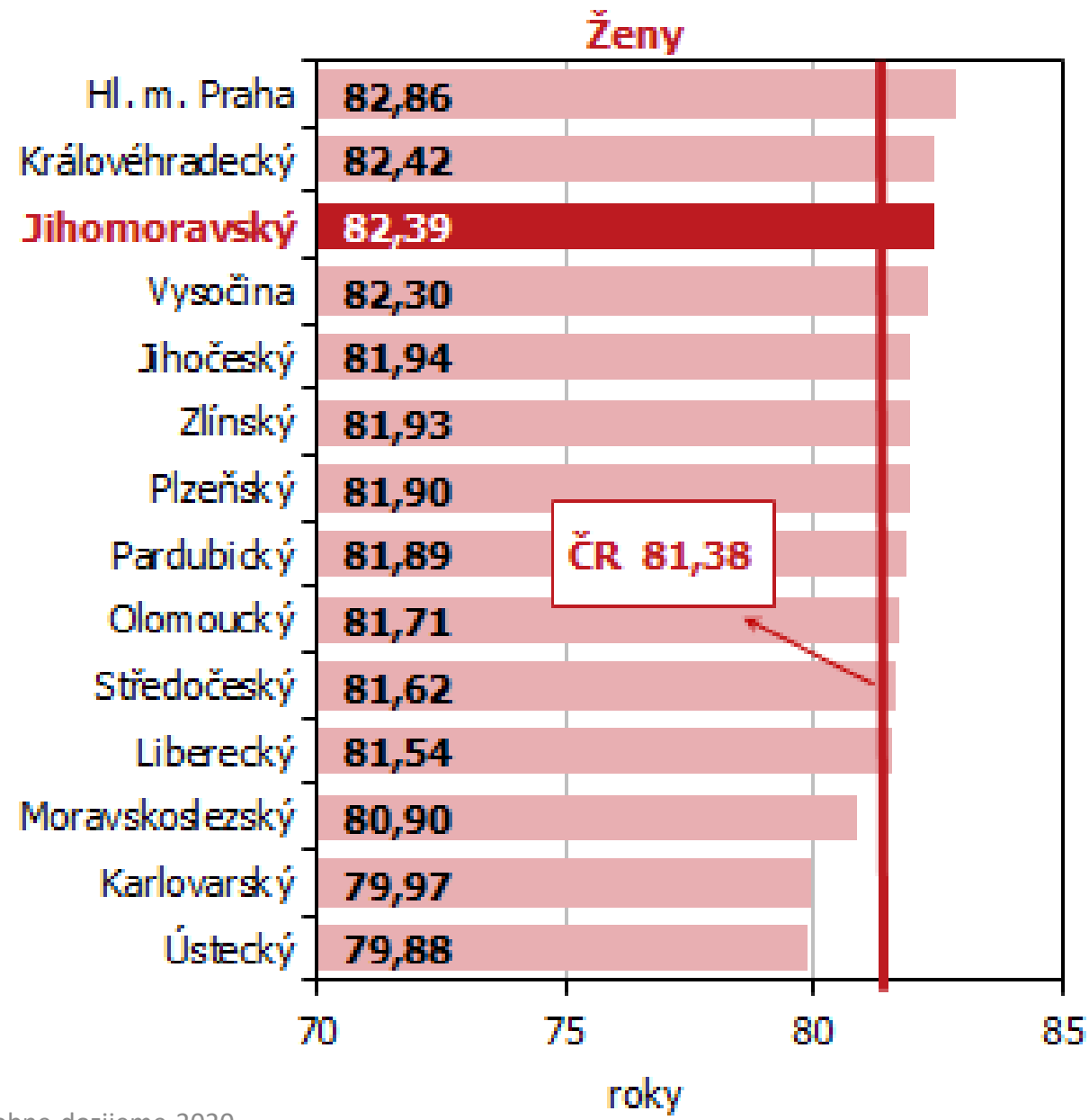
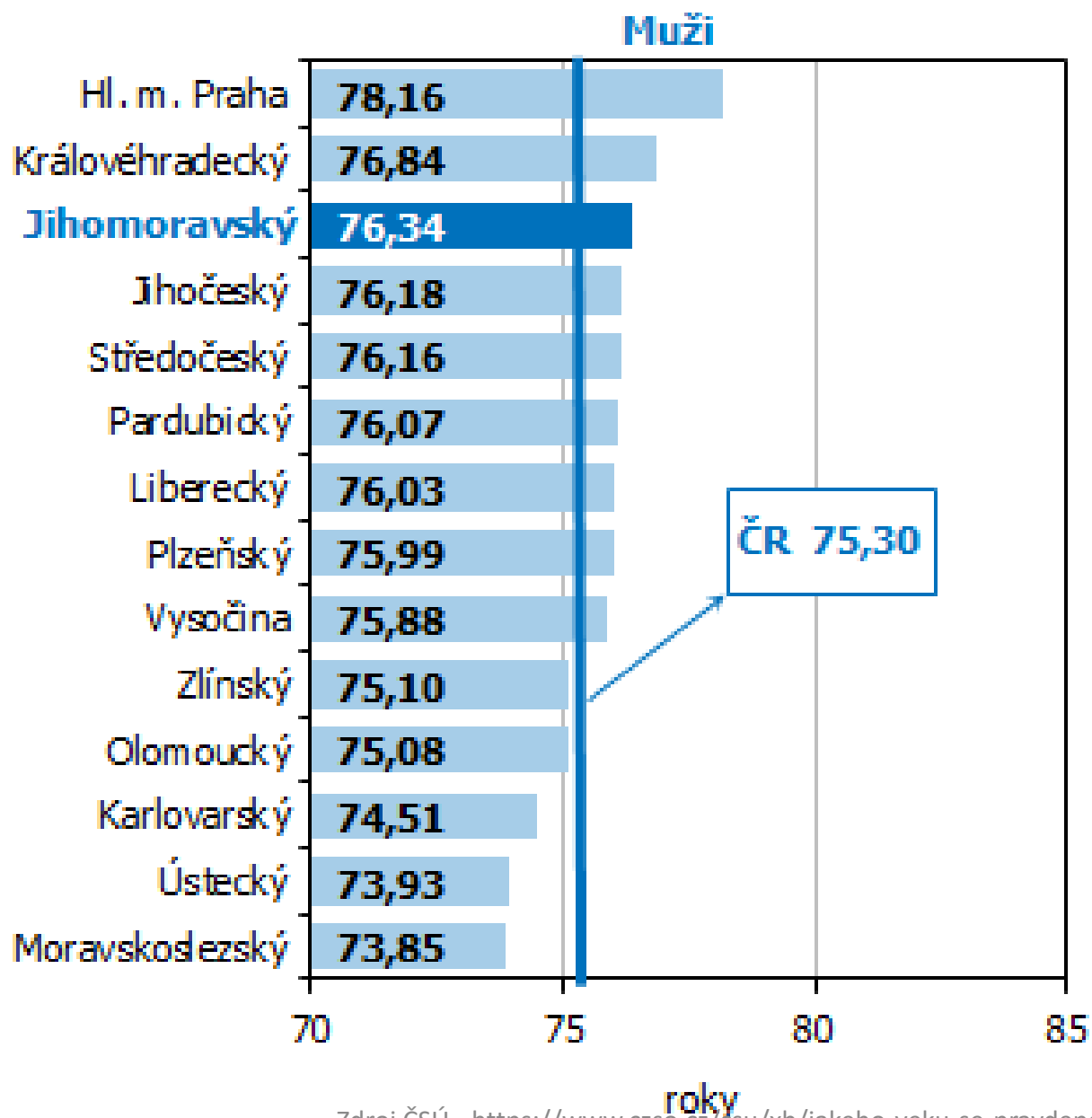


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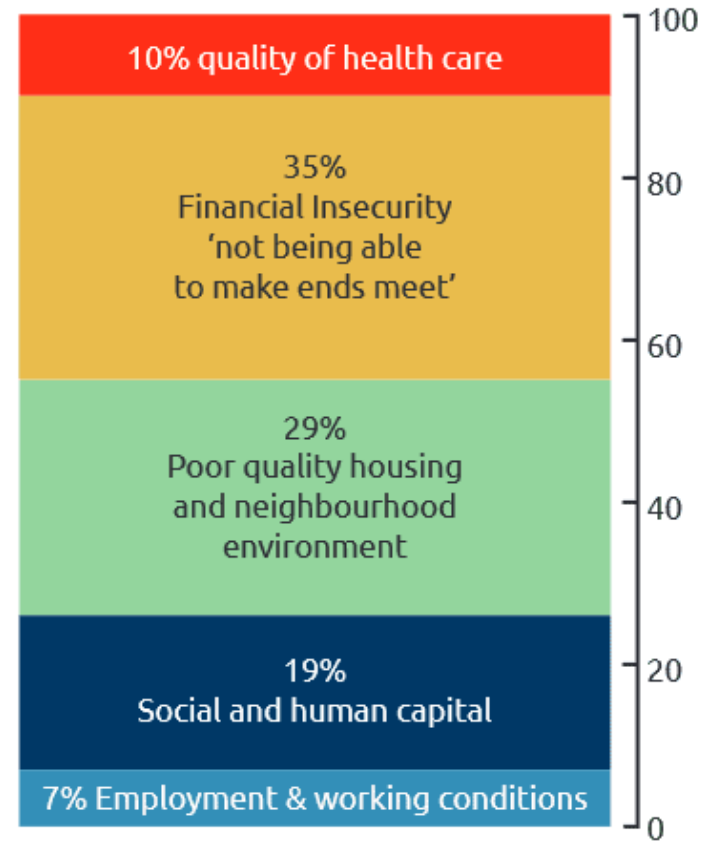
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Education

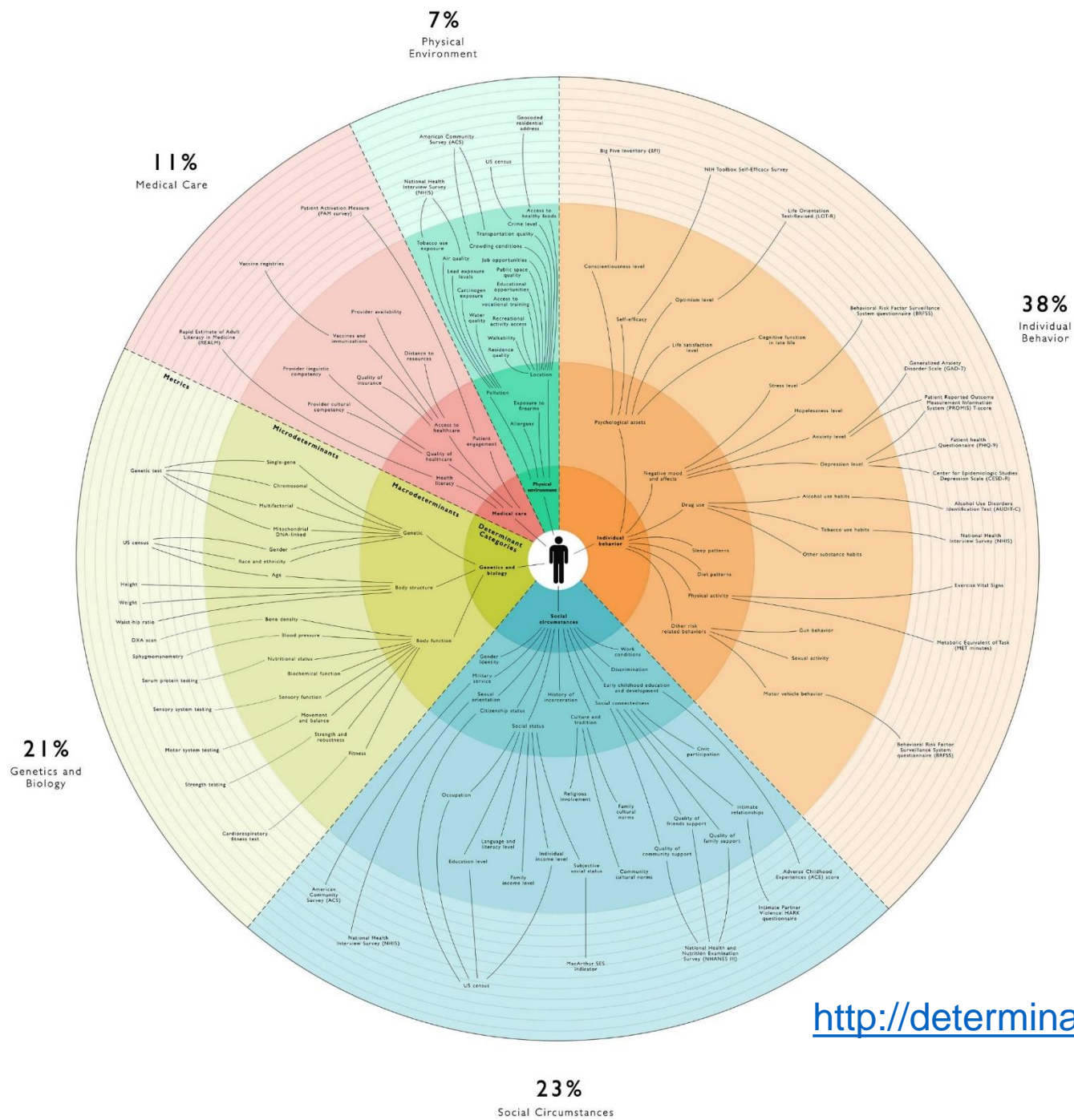


# Causes of health inequalities



Are all health determinants  
equal?

NO!

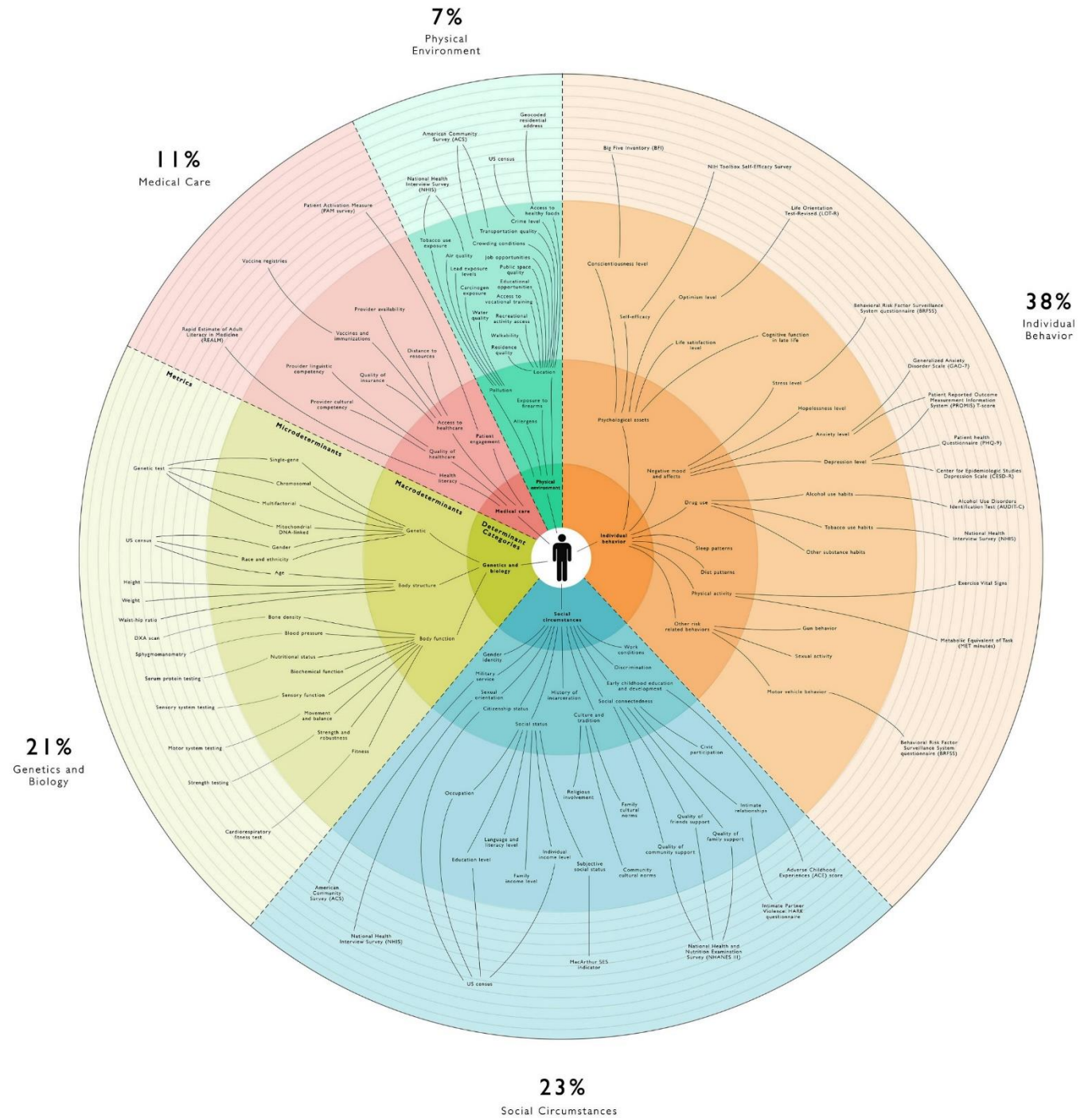


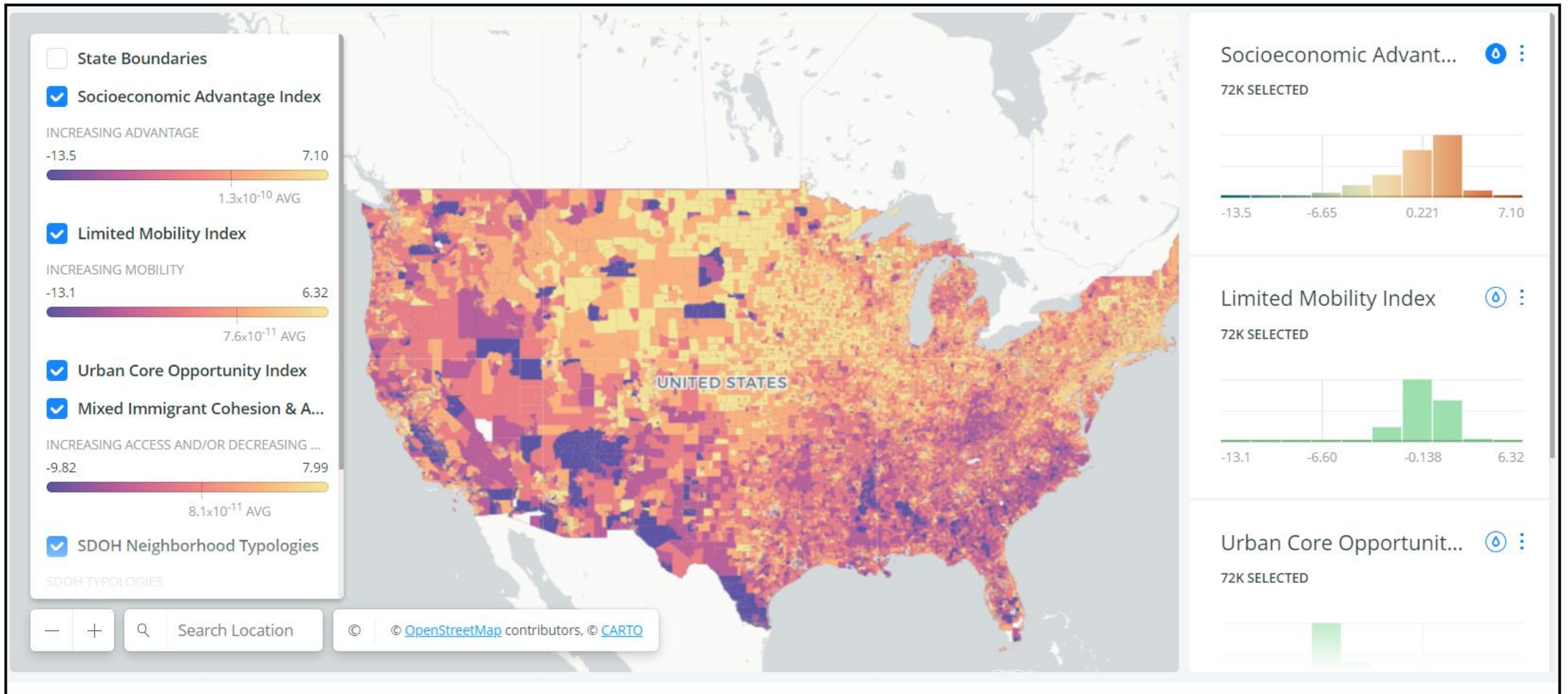
<http://determinantsofhealth.org>

**23%**  
Social Circumstances

# Statistical relevance of determinants:

- Ranking
  - Individual behaviour 38%
  - Social determinants 23%
  - Genetics and biology 21%
  - Medical care 11%
  - Physical environment 7%
- Be careful with generalisation !
  - Interprets the data of population (North America)
  - Little relevance to individual cases





## Geographical variability

# Quantification of Neighborhood-Level Social Determinants of Health in the Continental United States

Kolak M, Bhatt J, Park YH, Padrón NA, Molefe A. Quantification of Neighborhood-Level Social Determinants of Health in the Continental United States. JAMA Netw Open. 2020;3(1):e1919928. doi:10.1001/jamanetworkopen.2019.19928



# Conclusions ...

The context of people's lives determine their health, and so

**blaming individuals for having poor health or crediting them for good health is inappropriate!**

Individuals are unlikely to be able to directly control many of the determinants of health.

- .... World health organisation <https://www.who.int/news-room/q-a-detail/determinants-of-health>

What can we do to change  
health determinants?

... we have to change society .....

# Health in all policies (example)



- The developed countries go beyond physical infrastructure
  - Social programs
    - Cash transfers
    - Reduction of poverty
  - Educational programs
    - Improving social status of individuals
    - Promoting healthy lifestyle
  - Behavioural incentives
    - Tobacco, Alcohol regulations

# Rio Political Declaration on Social Determinants of Health

---

Work across different sectors and levels of government

---

Develop policies that are inclusive and take account of the needs of the entire population

---

Specific attention to vulnerable groups and high-risk areas

---

Support comprehensive programmes of research

---

Promote awareness of policy-makers

---

Support all sectors to address social determinant

---

Foster collaboration with the private sector, safeguarding against conflict of interests,

---

Strengthen occupational health safety

---

Promote and strengthen universal access to social services and social protection floors

---

Give special attention to gender-related aspects

---

Access to affordable, safe, efficacious and quality medicines

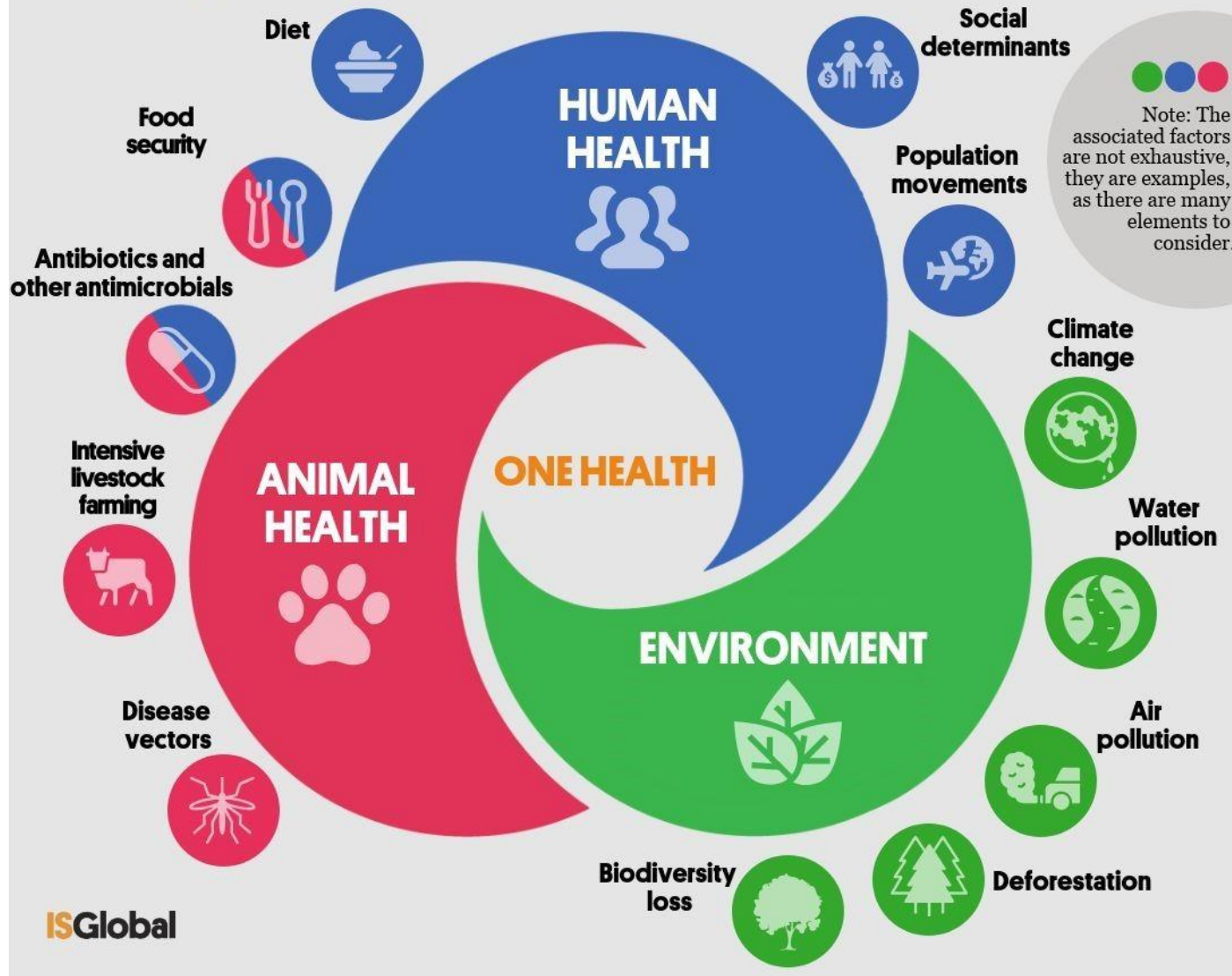
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Strengthen international cooperation



# ONE HEALTH

Human health and animal health are interdependent.  
At the same time, both depend on the environment.



Balancing public health  
objectives against other  
societal/cultural values

# High COVID-19 Attack Rate Among Attendees at Events at a Church — Arkansas, March 2020

Weekly / May 22, 2020 / 69(20);632-635

On May 19, 2020, this report was posted online as an MMWR Early Release.

Allison James, DVM, PhD<sup>1,2</sup>; Lesli Eagle<sup>1</sup>; Cassandra Phillips<sup>1</sup>; D. Stephen Hedges, MPH<sup>1</sup>; Cathie Bodenhamer<sup>1</sup>; Robin Brown, MPAS, MPH<sup>1</sup>; J. Gary Wheeler, MD<sup>1</sup>; Hannah Kirking, MD<sup>3</sup> ([View author affiliations](#))

[View suggested citation](#)

## Summary

### What is already known about this topic?

Large gatherings pose a risk for SARS-CoV-2 transmission.

### What is added by this report?

Among 92 attendees at a rural Arkansas church during March 6–11, 35 (38%) developed laboratory-confirmed COVID-19, and three persons died. Highest attack rates were in persons aged 19–64 years (59%) and ≥65 years (50%). An additional 26 cases linked to the church occurred in the community, including one death.

### What are the implications for public health practice?

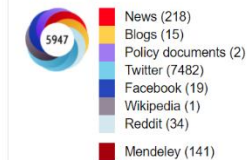
Faith-based organizations should work with local health officials to determine how to implement the U.S. Government guidelines for modifying activities during the COVID-19 pandemic to prevent transmission of the virus to their members and their communities.



On March 16, 2020, the day that national social distancing guidelines were released (1), the Arkansas Department of Health

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Policie na Staroměstském náměstí použila obrněný transportér, slzný plyn i vodní děla. Dav rozhání koňmi. Na místě jsou zranění. (18. října 2020)

Autor: Tomáš Krist, MAFRA



ABOUT

The Nanny State Index (NSI) is a league table of the worst places in the European Union to eat, drink, smoke and vape. The initiative was launched in March 2016 and was a media hit right across Europe. It is masterminded and led by IEA's Christopher Snowdon with partners from all over Europe.

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PREVIOUS VERSION: 2019

CATEGORIES



ABOUT THE EDITOR

Christopher Snowdon is the head of Lifestyle Economics at the Institute

THE INDEX 2021

|     |             | LEAST FREE | LESS FREE    | FREER            | FREEST  |       |              |
|-----|-------------|------------|--------------|------------------|---------|-------|--------------|
|     | COUNTRIES   | ALCOHOL    | E-CIGARETTES | FOOD/SOFT DRINKS | TOBACCO | TOTAL | 2019 RANKING |
| 1   | NORWAY      | 22.4       | 13.9         | 5.3              | 9.9     | 51.5  | -            |
| 2   | LITHUANIA   | 24.1       | 9.9          | 3                | 9.2     | 46.2  | 2            |
| 3   | FINLAND     | 20.4       | 10           | 1.7              | 9       | 41.1  | 1            |
| 5=  | HUNGARY     | 6.9        | 10.4         | 10               | 11.9    | 39.2  | 5            |
| 5=  | LATVIA      | 14.9       | 8.9          | 5                | 10.4    | 39.2  | 7            |
| 6   | ESTONIA     | 16.5       | 10.6         | 3                | 9       | 39.1  | 3            |
| 7   | ICELAND     | 21.6       | 5            | 1.3              | 8.1     | 36    | -            |
| 8   | IRELAND     | 16.9       | 3            | 4.7              | 11.3    | 35.9  | 6            |
| 9   | POLAND      | 12.2       | 9.2          | 5.7              | 8.6     | 35.7  | 12           |
| 10  | SWEDEN      | 18.2       | 7.7          | 1                | 5.9     | 32.8  | 8            |
| 11  | GREECE      | 9.6        | 10.1         | 1.3              | 10.7    | 31.7  | 11           |
| 12  | UK          | 11         | 3            | 5                | 12.4    | 31.4  | 4            |
| 13  | CROATIA     | 10         | 7            | 3                | 9.4     | 29.4  | 15           |
| 14  | SLOVENIA    | 9.5        | 7.2          | 1.3              | 10      | 28    | 9            |
| 15  | FRANCE      | 9.6        | 4.5          | 3                | 10.5    | 27.6  | 10           |
| 16  | ROMANIA     | 7.8        | 7.5          | 0                | 12      | 27.3  | 17           |
| 17  | PORTUGAL    | 6.6        | 9.3          | 3.7              | 6.8     | 26.4  | 14           |
| 18  | NETHERLANDS | 6.3        | 7.9          | 0.7              | 9.6     | 24.5  | 21           |
| 19  | CYPRUS      | 5.7        | 9.4          | 0                | 8.1     | 23.2  | 13           |
| 21= | AUSTRIA     | 5.8        | 7.9          | 0.7              | 6.8     | 21.2  | 26           |
| 21= | BELGIUM     | 3.3        | 7.6          | 2                | 8.3     | 21.2  | 16           |
| 22  | BULGARIA    | 4.5        | 3.5          | 2                | 10.8    | 20.8  | 18           |
| 24= | MALTA       | 7.3        | 3.3          | 0                | 8.6     | 19.2  | 19           |
| 24= | SLOVAKIA    | 5.9        | 5.3          | 0                | 8       | 19.2  | 26           |
| 25  | DENMARK     | 3.6        | 3.7          | 3.3              | 6.9     | 17.5  | 20           |
| 26  | ITALY       | 5          | 4.5          | 0.7              | 7       | 17.2  | 23           |
| 27  | SPAIN       | 4.3        | 4.7          | 0.3              | 7.6     | 16.9  | 23           |
| 28  | LUXEMBOURG  | 4          | 6.9          | 0                | 5.3     | 16.2  | 24           |
| 29  | CZECHIA     | 4.2        | 3.3          | 0                | 7.7     | 15.2  | 27           |
| 30  | GERMANY     | 3          | 3            | 0                | 4.7     | 10.7  | 28           |

Thank you for your attention

