Population and Health

Introductory seminar.
Population health issues.

MAX PLANCK INSTITUTE FOR DEMOGRAPHIC RESEARCH

MAX-PLANCK-INSTITUT FÜR DEMOGRAFISCHE FORSCHUNG

РЭШ
Российская
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школа

Health is a concept that may vary with time and place:

Ancient Greece – "illness as the irrevocable decree of the Olympian gods";
Early Christianity – unhealthy state/illness is "a punishment of God"

Dubos (1972):
The circumstances in which an organism reacts by adaptation, at the same time preserving its individual integrity.

Dufresné (1985):
Health is not having to think about health.

Last et al. (2001):
   Health is a state characterized by
   - anatomic and physiologic integrity;
   - ability to perform personally valued family work and community roles;
   - ability to deal with physical, biologic, psychological, and social stress;
   - a feeling of wellbeing;
   - a freedom from the risk of disease and untimely death".

Source: Sermet & Cambois, 2006; Gourbin & Wunsch, 2006; Blaxter, 2004.

What does the WHO think ?

The WHO (1946): "health as the absence of disease, or ability to function".

The WHO (1953): *Health is a state* of complete physical, mental, and social wellbeing, *and **not** merely the absence of disease or injury".

The WHO "World Health Declaration" (1998) signed by <u>all</u> member countries:

1. Improvement of the health and well-being of people is the ultimate aim of social and economic development. Good health is fundamental to sustainable economic growth.

2. Enjoyment of the highest attainable standard of health is one of the fundamental rights of <u>EVERY</u> human being.

<u>"Health-for-All Policy for the 21st century"</u> / *Framework for the WHO European Region* aims to aims to implement the aforementioned principles **through relevant regional and national policies and strategies.**

❖ **Positive versus negative health measures:**
  - official definitions use a positive approach (e.g. The WHO: "health is complete physical, mental, and social wellbeing");
  - but most of quantitative research is based on negative definition and focus on consequences of health problems (such as diseases or death).

❖ **From death rates to sickness and self-perception:**
  - in *high mortality regimes* – death rates are the principal measures of population health;
  - in the conditions of *substantial lengthening of life expectancy* more attention is paid to ability of functioning, disability and handicap, incidence and prevalence of diseases, and individual perceptions of own health.

Note that in some cases subjective and objective stories may differ. Really ill people can be insensitive to serious health problem, but can feel really badly about small problems.

4

Reasonable statistics of health

❖ **Mortality and age at death –** the most reliable, clearly defined, and most important measure of health.

❖ **Morbidity –** is connected to the presence of *medically defined* diseases. *Diagnosed and measured morbidity* reports illnesses indicated by medical doctors or found during clinical examinations of the population. *Reported* morbidity refers to information on illnesses provided by individuals during the health surveys.

❖ **Disability, handicap, dependency, and impairment -** refer to the *consequences of diseases, accidents or physiological ageing* on the functioning of the individual in the daily life. Can be both diagnosed and reported.

❖ **Perceived (subjective) health** – reflects the feelings of individuals towards their health, and does not necessarily refer to the objective state of health. The WHO: How is your health in general? Very good, good, fair, bad, very bad.

Standardized questionnaires for a higher objectivity.

Source: Sermet & Cambois, 2006.

5

Biomarker studies

Standardized biomedical measurements in population-representative or population-based samples.

❖ **General fit**
Height, weight, length of leg, muscle (handgrip) strength.

❖ **Simple physical and cognitive tests**
Ability to stand up, to walk quickly, to hear, to see,
to remember, to react, to follow instructions, to count …

❖ **Classic cardiovascular risk factors**
Blood pressure, blood lipids, body mass index, waist and hip circumferences,
blood glucose and their combinations (Metabolic Syndrome).

❖ **Stress and inflammation markers**
C-reactive proteine, interleukine-6, cortisol, adrenaline and noradrenaline.

❖ **Functioning of the heart**
Parameters of ECG shapes, measures of heart rate and heart rate variability.

The biomarker measurements can be performed at one time point (cross-sectional surveys), at several time points (follow-up surveys) or continuously during days, months or years (monitoring surveys).

❖ **Population health refer to health faced by an average or randomly chosen individual.**

❖ **Does variation within population matter?**

OR
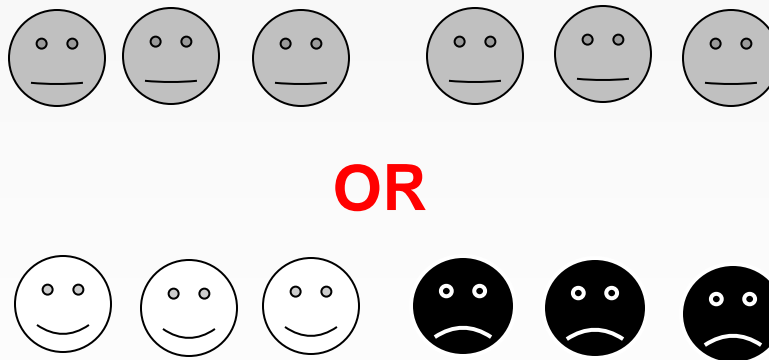
❖ **Population health - health outcomes of a group of individuals, including the distribution of such outcomes within the group**

Sources: Preston, Heuveline & Guillot, 2001; Kindig & Stoddart, 2003.

Population health in demography:
a traditional approach

❖ **Demography studies the structure and dynamics of populations.**

❖ **Demography concentrates on the importance of health (mortality) on population reproduction and changes in population composition.**

Population balancing equation:
$$P(t+1) = P(t) + B(t) - \textcolor{red}{D(t)} + I(t) - E(t)$$

❖ **Demographers are not interested in specifics of health of individuals *per se*, they rather focus on how many and at what ages people die and what are the consequences for population dynamics and composition.**

❖ **Demographers invented important methods for population-level analyses of mortality.**

8

❖ Growing importance of health issues, increasing value of human life in modern ethics forced to extend the narrow definition of health (mortality) as component of population dynamics to **health as one of the central research questions in demography**;

❖ **A broader perspective towards population health issues:**
- by integrating causes of death into analyses;
- by using a wider range of measures of health;
- by looking more closely at health variations *across* and *within* populations;
- by seeking explanations in other disciplines.

❖ **Concept of medical demography (Vaupel, 1995):**
- in intersection of demography, epidemiology, and biostatistics;
- study the structure and dynamics of populations, but more focus on morbidity and disability;
- study mortality in the context of disease and ageing processes;
- analyses at population and individual levels;
- methods of formal demography and statistical methods for analyses of survival data.

9

Population health in epidemiology

❖ ***Classical epidemiology*** is population oriented and "studies the community origins of health problems, particularly related to nutrition, environment, human behaviour, and psychologic, social, and spiritual state of a population".

❖ ***Clinical epidemiology*** – "study patients in health care settings in order to improve diagnosis and treatment of various diseases and prognosis for patients already affected by the disease".

❖ ***Social epidemiology*** "is the study of how society and different forms of social organization influence the health and well-being of individuals and populations. In particular, it studies the frequency, distribution, and social determinants of the states of health in a population.
Thus, **social epidemiology goes beyond the analysis of individual risk factors to include the study of the social context in which the health-disease phenomenon occurs"** (Krieger, 2002).

❖ Greater focus on individual-level analyses.
❖ Specific data, methods, and measures (incidence, prevalence,…).

10

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11

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