



International Conference
“Demographic Trends in Russia: Legacy of the
Soviet Era or a New Tendency?”

Reflections on theories in demography

by Evgeny M. Andreev

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I will not retell my recent paper "Reflections on demographic theories" or the wonderful chapter by Hubert Gérard "Theory Building in Demography". The chapter begins with the words

"In demography, as in social sciences generally, theory is a polysemous term whose different meanings have their own relevance and value."

But it seems to me that in demography it would be correct to understand the theory in the same way as in the natural sciences.

A Andreev Evgeny M. Reflections on demographic theories. Population and Economics. 2019. 3(2): 1–9

Gérard Hubert. Theory Building in Demography. In: Caselli G., Vallin J., Wunsch G. et al. Demography: analysis and synthesis: a treatise in population studies. Volume IV. 2006. P. 647-660.

Theory in the natural sciences

A theory in the natural sciences is a text that

(1) **explains** everything that at the time of the creation of the theory was known about the object of the theory and

(2) **predicts** previously unknown properties of the object of the theory, which can be verified experimentally.

The theory is accepted if the verification is successful.

It seems to me that there is not much difference between this scheme and the construction of the theory by Hubert Gérard.

The theory of the epidemiological transition

The topic of my presentation is the theory of the epidemiological transition, which is extremely popular in Russia. It is referred to in articles, dissertations, in applications for Russian grants and discussions.

The term "theory of the epidemiological transition" appeared in the cognominal paper by Abdel Omran.

This paper contains a rather schematic and not always accurate description of the first stage of mortality reduction mainly with a focus on Western European countries.

To confirm, I will give three quotes from the paper.

First quote from “Theory of the epidemiological transition”

Focus of the Theory of Epidemiologic Transition

Conceptually, the theory of epidemiologic transition focuses on the complex change in patterns of health and disease and on the interactions between these patterns and their demographic, economic and sociologic determinants and consequences. An epidemiologic transition has paralleled the demographic and technologic transitions in the now developed countries of the world and is still underway in less-developed societies. Ample evidence may be cited to document this transition in which degenerative and man-made diseases displace pandemics of infection as the primary causes of morbidity and mortality.

Second quote from “Theory of the epidemiological transition”

The determinants of the transition from infectious to degenerative disease predominance are by no means simple. Their detailed treatment is beyond the scope of this paper; however, it may be useful to mention three major categories of disease determinants.

Further, the author calls:

- (1) a reduction in the risk of contracting some infections;
- (2) Socio-economic and cultural progress;
- (3) the progress of medicine and public health.

Third quote from “Theory of the epidemiological transition”

During the epidemiologic transition the most profound changes in health and disease patterns obtain among children and young women... probably because the susceptibility of these groups to infectious and deficiency diseases is relatively high.

I did not find the words "obstetric care" or any synonyms in the paper.

The development of the theory of the epidemiological transition

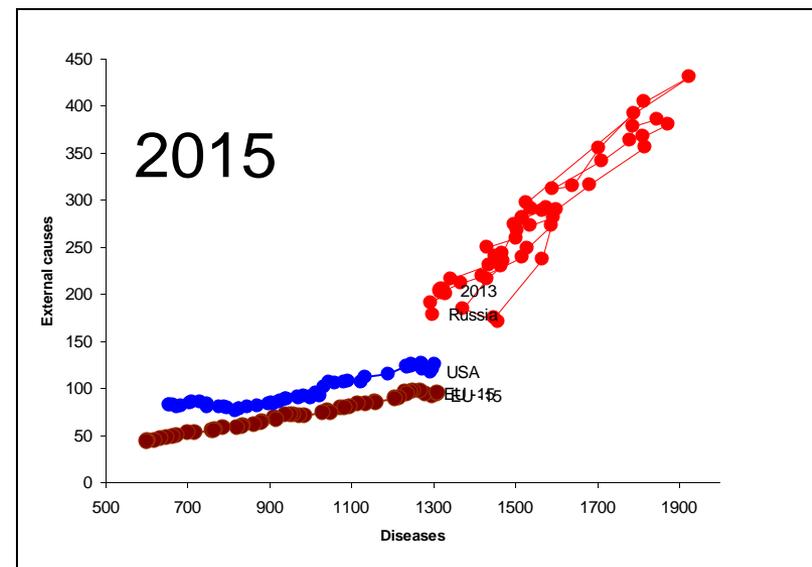
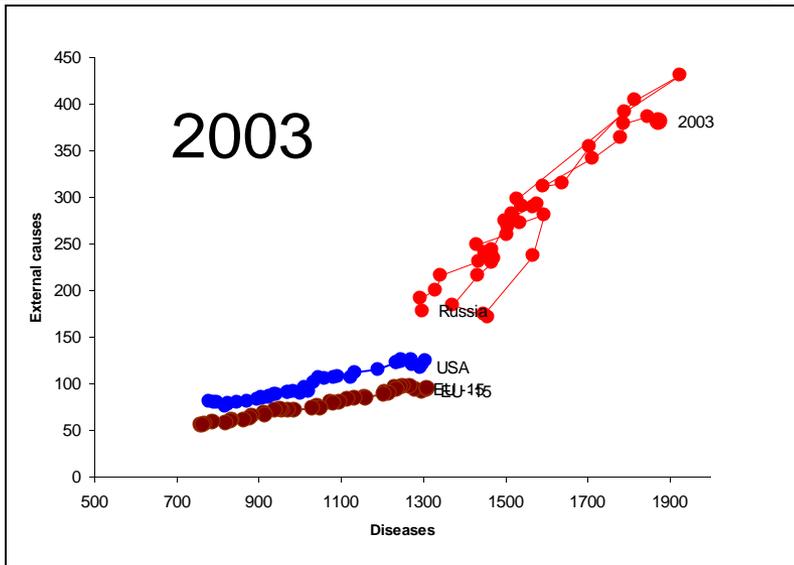
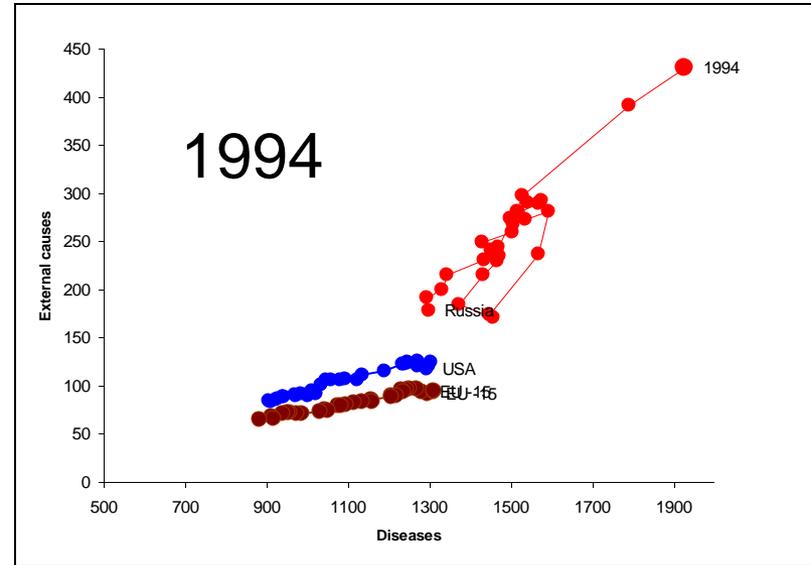
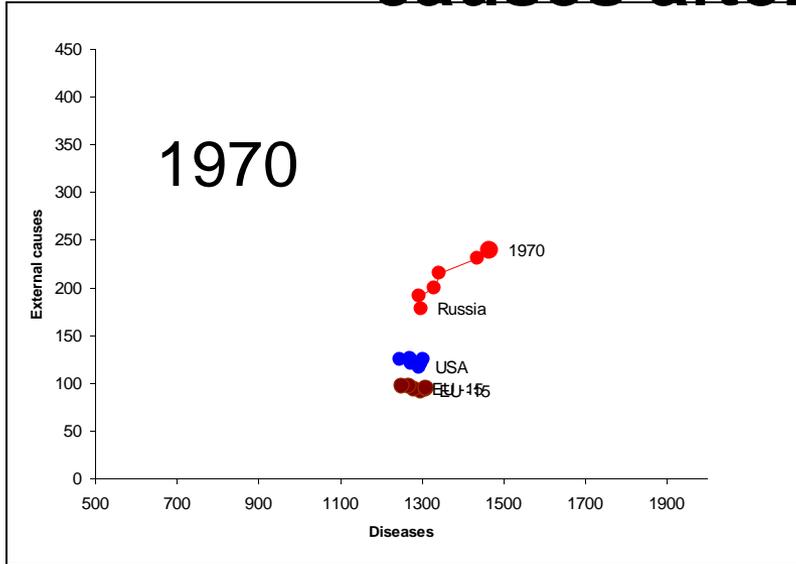
Omran's epidemiological transition ends when life expectancy of 50 years was reached but later Omran and other researchers continued the theory so that it also covers a further life expectancy growth as a result of reduced mortality from "degenerative and man-made diseases".

Nonetheless the nature of the theory has not changed: it describes, but does not explain. Therefore, the main conclusion is not the "equation of motion", but a specific trajectory (or several trajectories) along which all populations move. The start time of the movement and the speed of movement may vary, some populations can even retreat, but not go aside. The same applies to social groups in some population.

Referring to the theory, we often say that in the process of the epidemiological transition Russia lags behind the Western countries

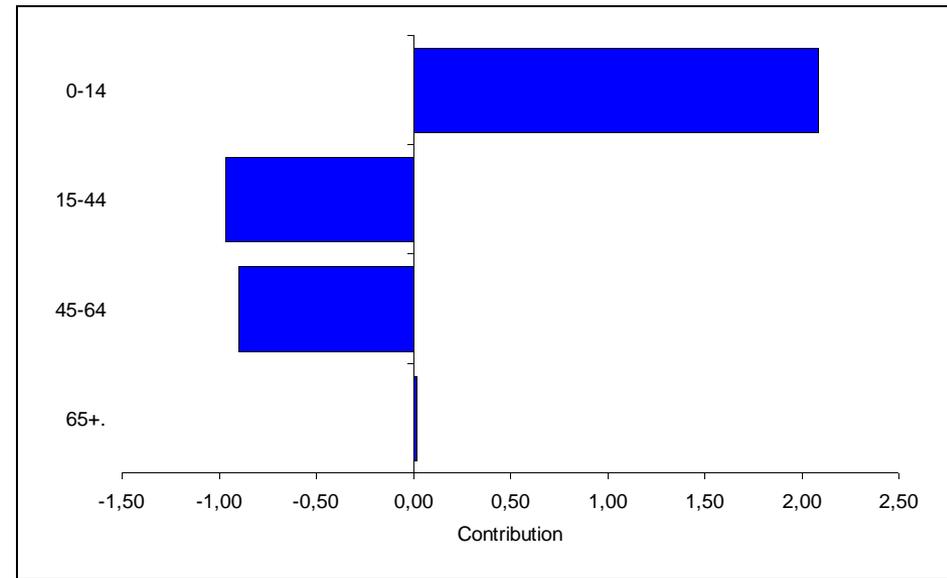
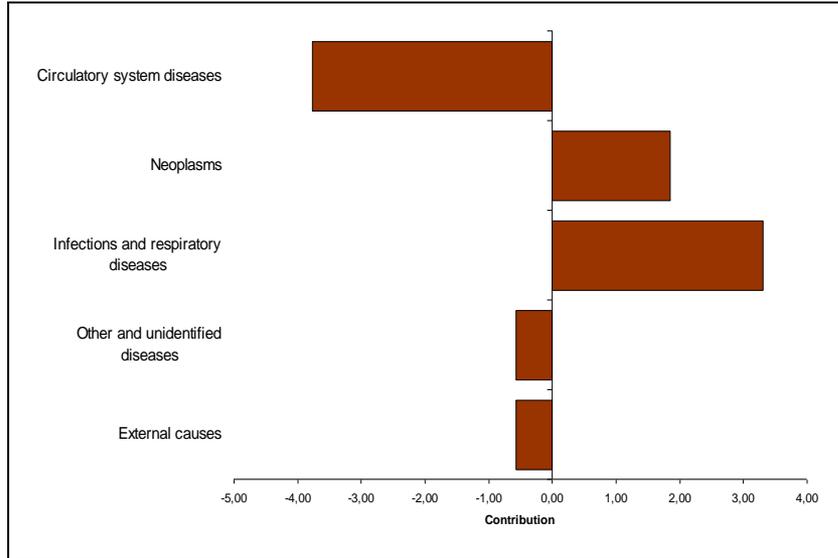
But in order to lag it is necessary to move in the same direction.`

Dynamics of male SDR from diseases and external causes after 1965 per 100000

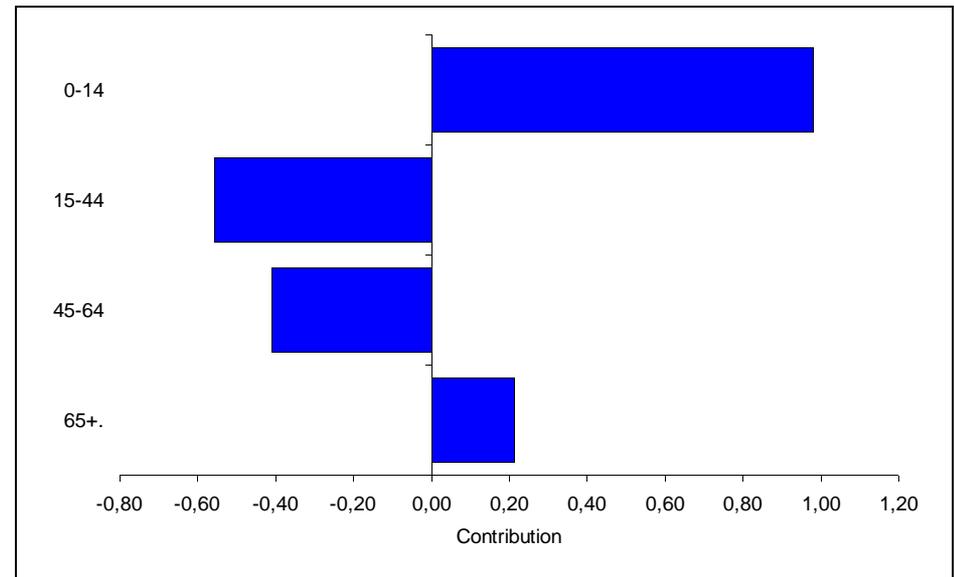
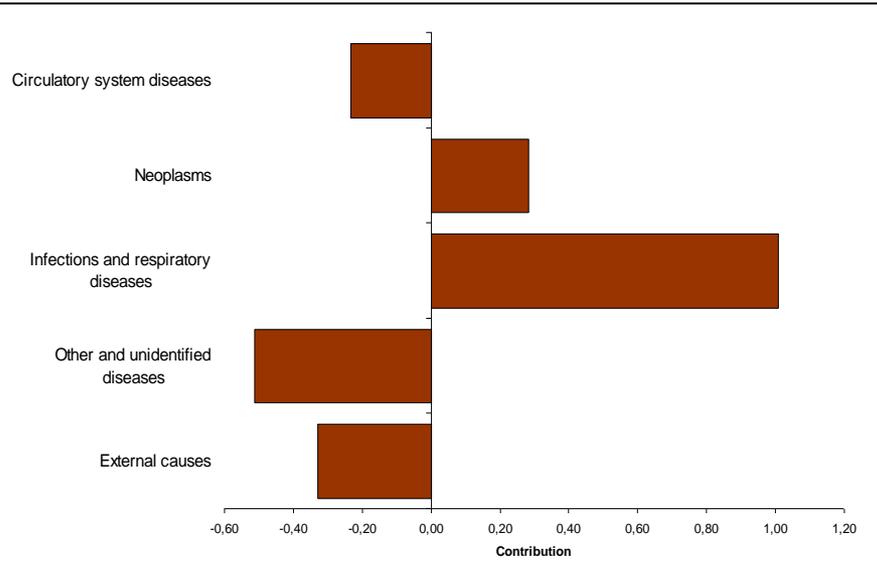


Often we say that the changes in mortality after 2003 were of a restorative nature, since in large part the increase in life expectancy compensated for the earlier losses.

The maximum life expectancy of men in 1964 was 64.9. After period of increasing mortality it was again achieved in 2013 and amounted to 65.1. The figures below show the decomposition of differences between the two mortality patterns by age group and by cause of death group.

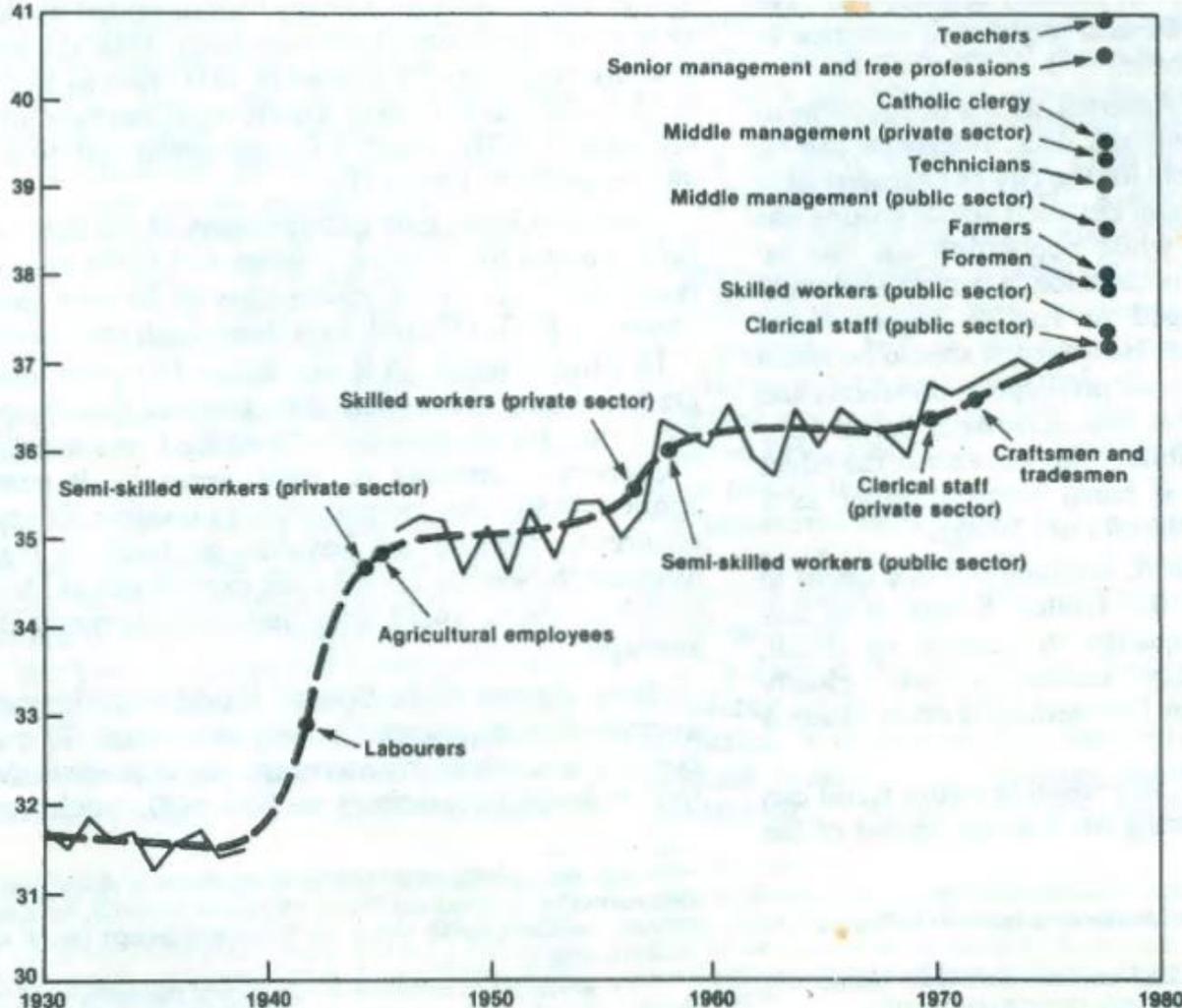


The maximum life expectancy of women in 1971 was 73.8. After period of increasing mortality it was again achieved in 2007 and amounted to 74.0. The figures below show the decomposition of differences between the two mortality patterns by age group and by cause of death group.



Mortality in different population groups varies significantly. It can be expected that changes in mortality do not occur simultaneously in different groups.

France: life expectancy at age 35 by socio-occupational groups with a national trend of the same indicator after 1930



Vallin, Jacques
Socio-economic determinants of mortality in industrialized countries //

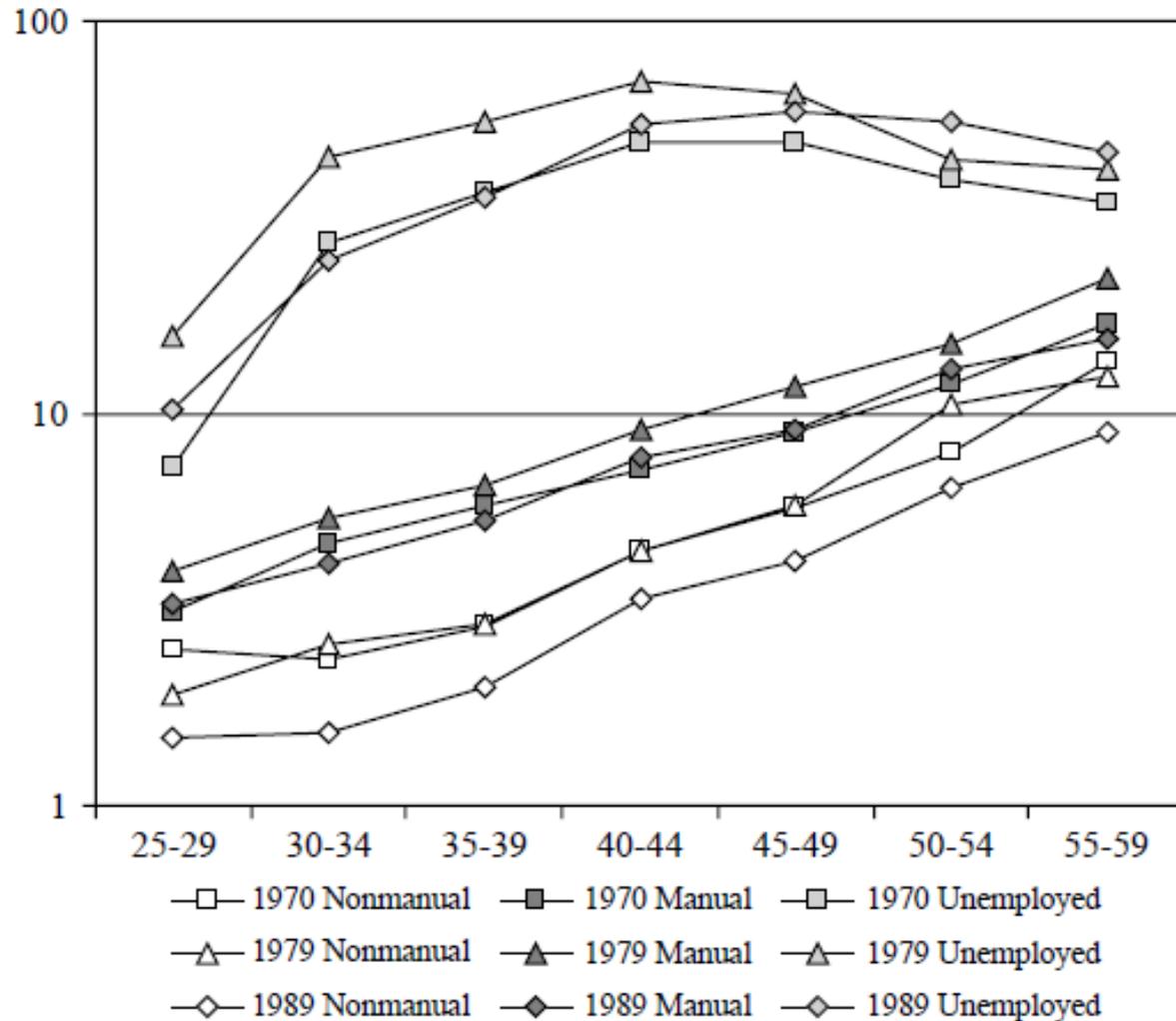
Population bulletin of the United Nations
No. 13-1980 26-41

Mortality growth in the 1960-80s, which was observed in the former Soviet republics and "socialist countries" did not affect non-manual workers.

Carlson, Elwood (1989) 'Concentration of rising **Hungarian** mortality among manual workers',
Sociology a

Carlson, Elwood and Tsvetarsky, S. (1992)
Concentration of rising **Bulgarian** mortality among
manual workers. Sociology and Social Research
76: 81-85.nd Social

Five-year mortality rates for men in urban Russia in 1970 and 1979 by occupational groups



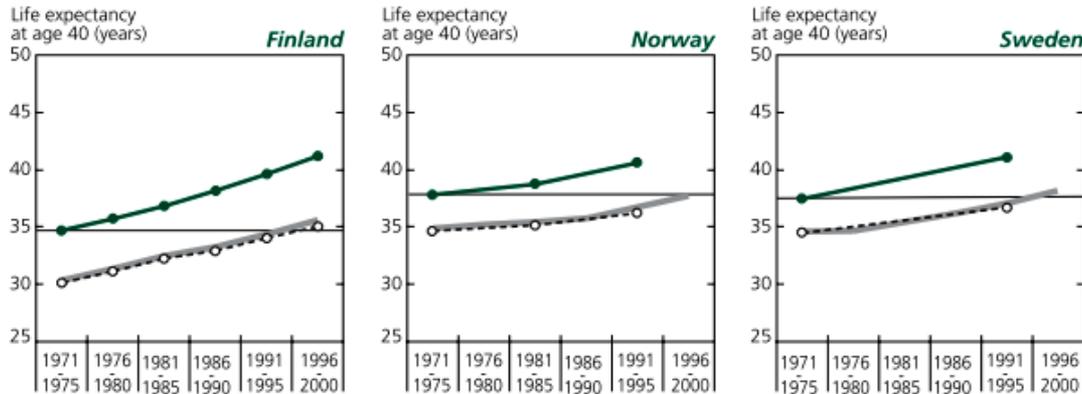
Andreev, E. M.;
 Hoffmann, R.; Carlson,
 E.; Shkolnikov, V. M.;
 Kharkova, T. L.:
 Concentration of
 working-age male
 mortality among manual
 workers in urban Latvia
 and Russia, 1970-1989
European Societies 11:1,
 161-185 (2009).

Do non-vanguard populations follow the mortality trajectories of the vanguard groups for different age ranges and for the major causes of death?

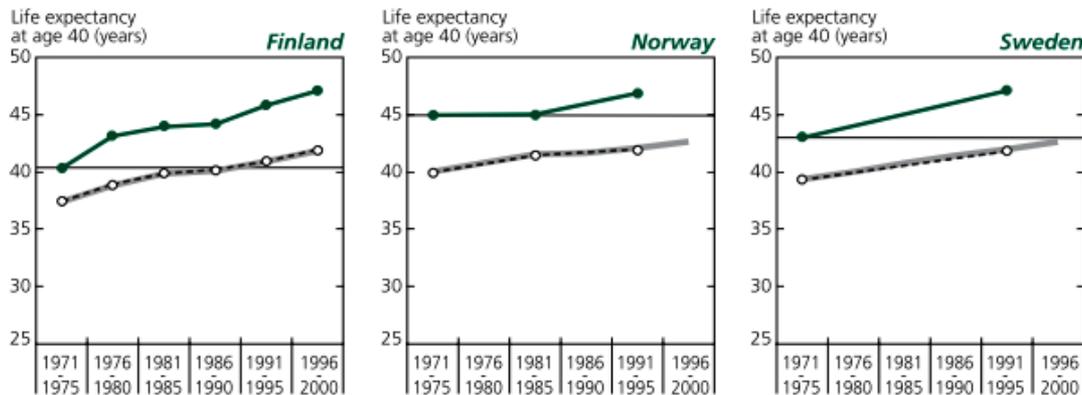
The study for Finland, Norway, and Sweden at 1970s to the 1990s does not show systematic convergence between vanguard and non-vanguard sub-populations. The study found that at the sub-national level, rather than simply following (with a certain time lag) the same path as the vanguard groups, non-vanguard groups have their own pathways to low mortality.

Trends in life expectancy at age 40 for the vanguard groups, non-vanguard groups and total populations of Finland, Norway, and Sweden, 1971-1975 to 1991-1995

Males



Females

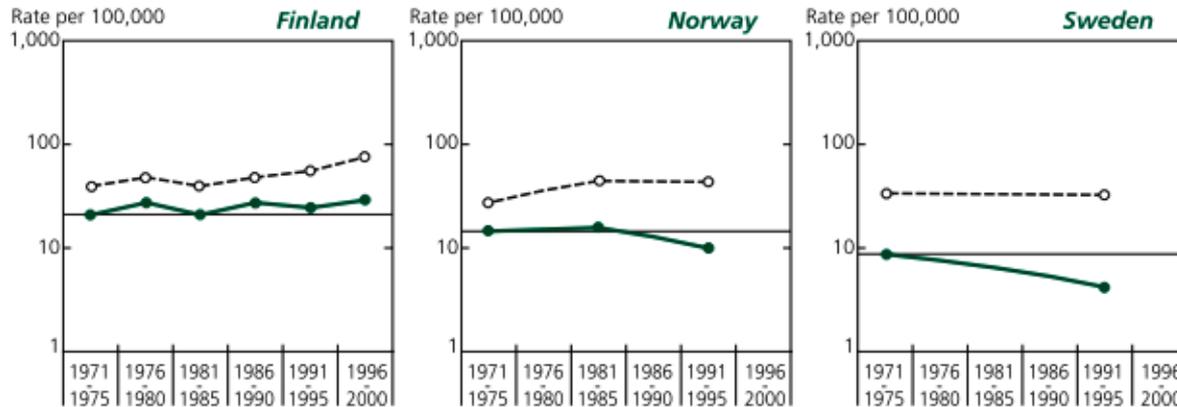


Jasilionis, D.;
 Shkolnikov, V. M.;
 Andreev, E. M.; Jdanov,
 D. A.; Vågerö, D.;
 Meslé, F.; Vallin, J.:
 Do vanguard
 populations pave the
 way towards higher life
 expectancy for other
 population groups?
 Population: English
 Edition 69:4, 531-556
 (2014).



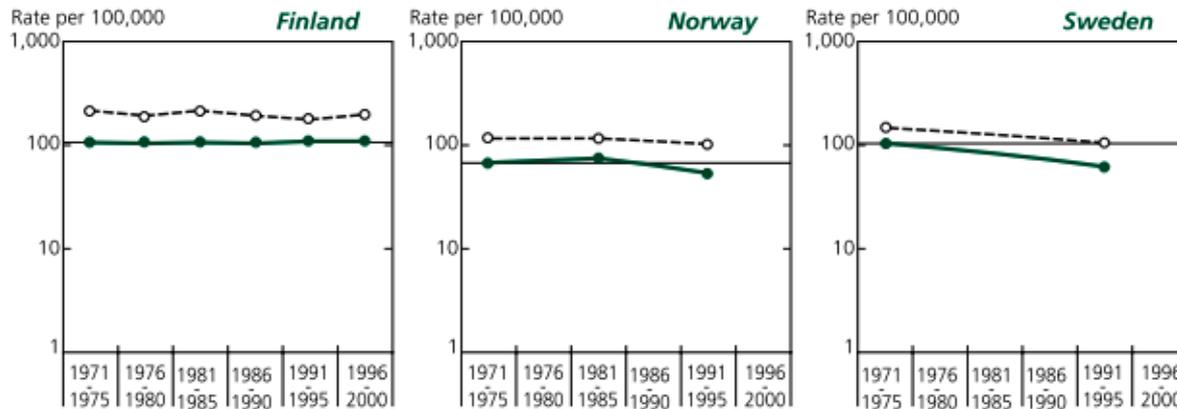
Male age-standardized death rates for external and alcohol-related causes for vanguard and non-vanguard groups in Finland, Norway, and Sweden, 1971-1975 to 1991-1995

Alcohol-related causes of death



(log scale)

External causes of death



Jasilionis, D.;
 Shkolnikov, V. M.;
 Andreev, E. M.; Jdanov,
 D. A.; Vågerö, D.;
 Meslé, F.; Vallin, J.:
 Do vanguard
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 (2014).

Causes of death

In his theory of the epidemiological transition Omran mentioned infections and famine vs. degenerative and man-made diseases.

But knowledge of the etiology is clearly insufficient to assess the prospects of mortality from some cause of death.

In my opinion, when analyzing the dynamics of mortality, it would be natural to classify the causes of death according to a potential opportunity in the considered time period to avoid or delay death from this cause.

The potential opportunity is knowledge.

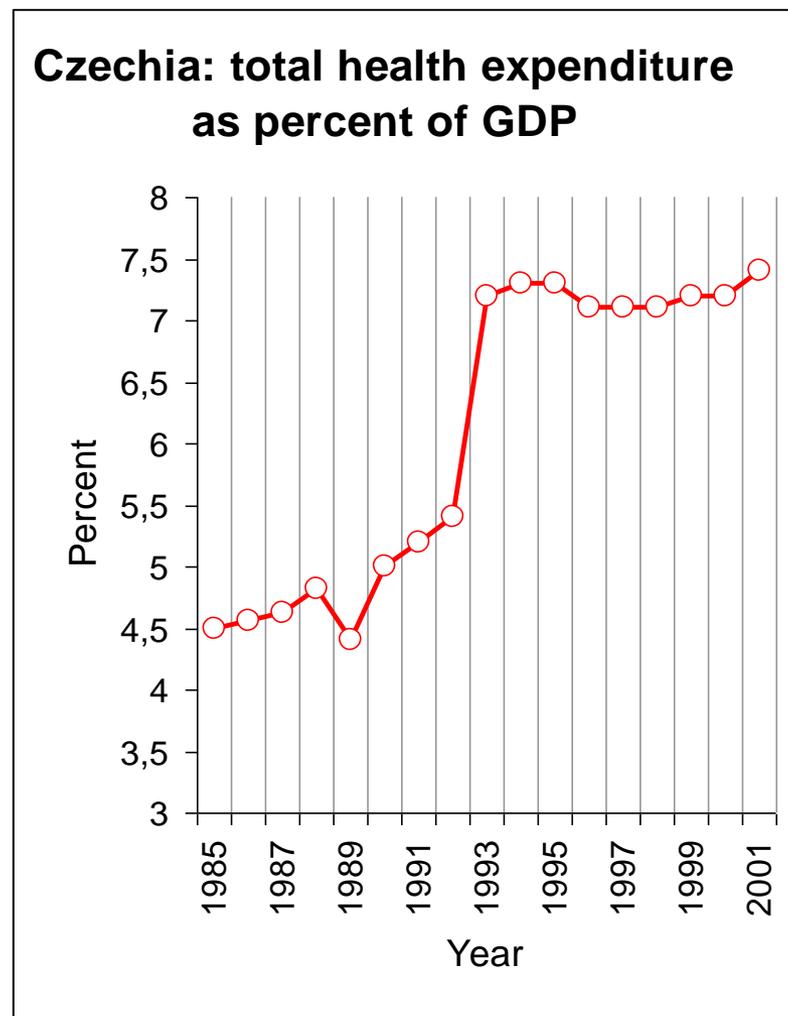
It becomes a real opportunity with the availability of resources and a sufficiently high priority of health when sharing resources.

How can we measure "priority of health"?

Everyone knows examples when successes in economics and science were accompanied by an increase in mortality.

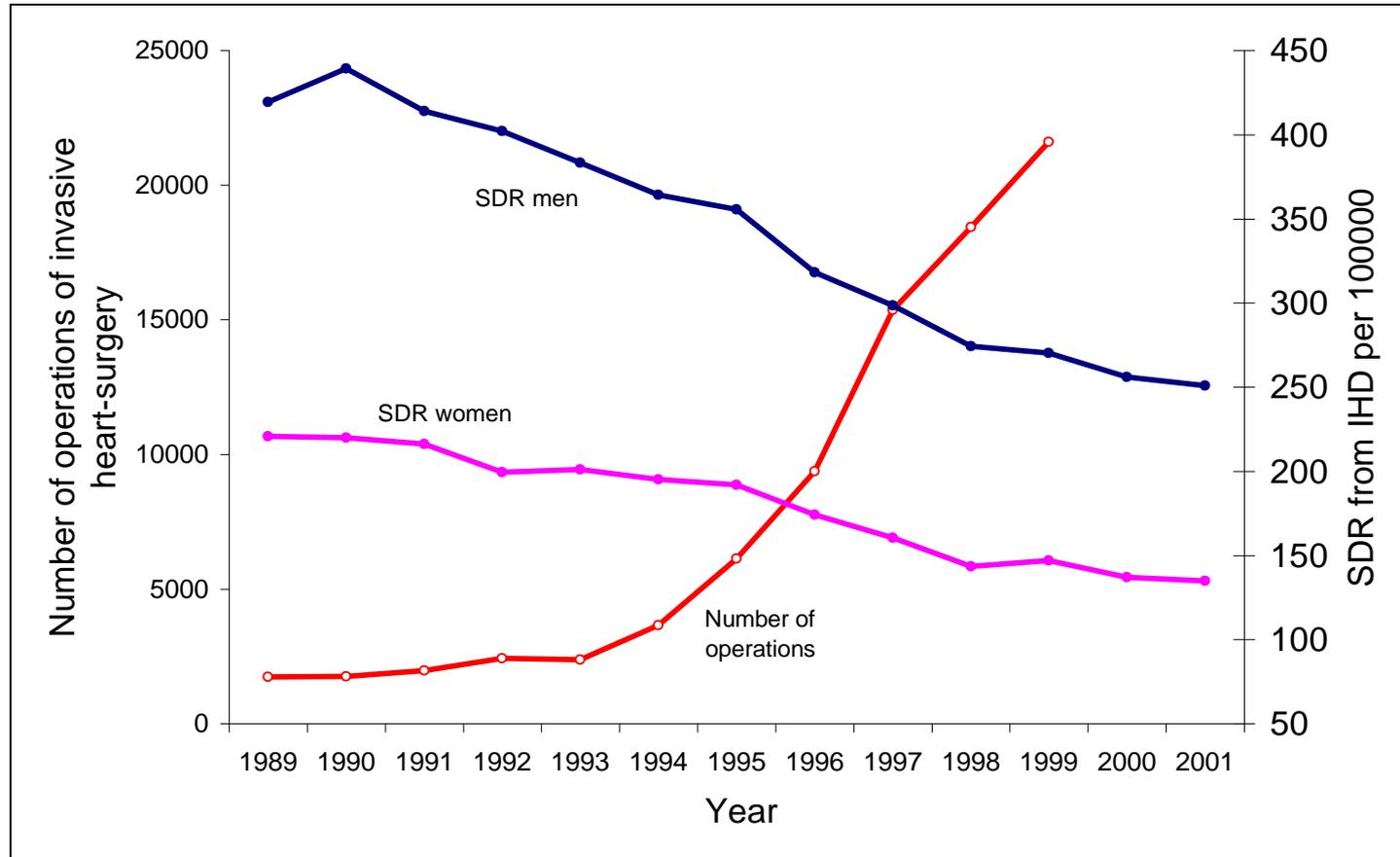
One can explain increase with a low priority of health

Maybe it can be measured by the deviation of the country from the Preston curve or by the percentage of total health expenditure in GDP, or something else.



Source: HFA

Increase in number of operations of invasive heart-surgery and decrease in SDR from IHD in Czechia



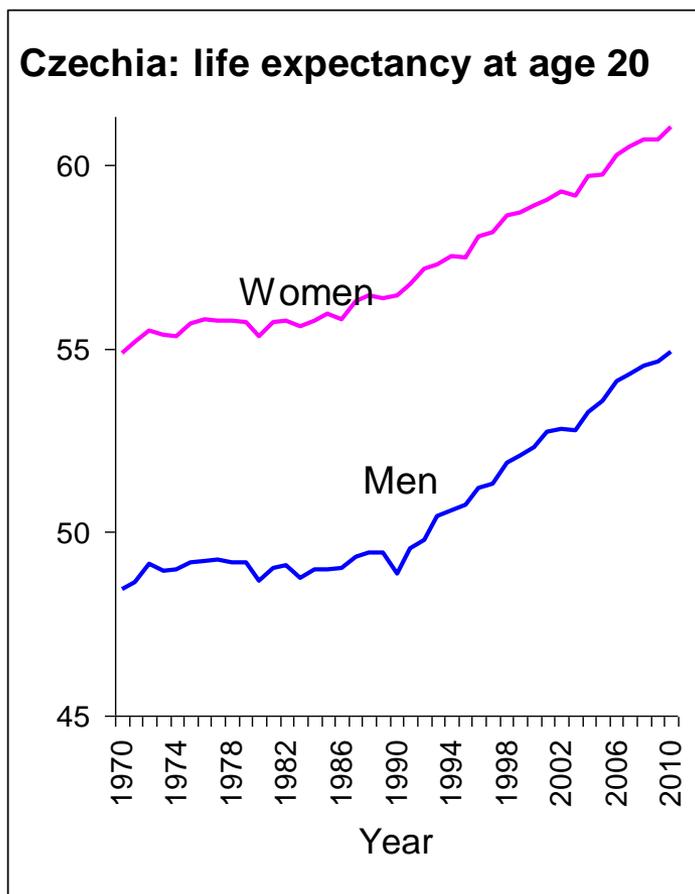
Source: WHO mortality database and Rychtarikova Jitka The case of the Czech Republic: Determinants of the recent favourable turnover in mortality. Demographic research, 2004 Special collection 2.

Jitka Rychtarikova about success of Czechia

Mortality from circulatory diseases decreased significantly at higher ages. The recent decline in mortality is likely to be attributable to technical progress in medical treatment and less affected by the change in lifestyle. While the use of cardiovascular drugs and the number of operations of invasive heart-surgery considerably improved, smoking and alcohol consumption have somewhat augmented at the same time.

Source: WHO mortality database and Rychtarikova Jitka The case of the Czech Republic: Determinants of the recent favourable turnover in mortality. Demographic research, 2004
Special collection 2.

Sequence of events



Source: HMD

The sequence of events is pretty clear:

- revolution in Czechoslovakia and change of priorities;
- increase in health expenditure;
- increase in the number of Invasive cardiology procedures;
- reduction in mortality from IHD;
- rapid increase in life expectancy at age 20.

I think that the theory of the epidemiological transition cannot add anything to it.

Thank you!