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Among the various determinants of quality of life, a satisfactory health status certainly is of striking importance at the individual and population level and may influence the wealth of nations.

Health is an heterogeneous process. Two types of factors, genetic and environmental, may be involved in this heterogeneity.

The variations at the level of genes are extensive and contribute to large variations in health status and age at death.

The environmental factors may be more important: they encompass the medical progress particularly in terms of prevention and access to care and the socio-economic levels responsible of inside-country and between country differences.

When you look at the differences in mean life expectancy in different countries and/or continents the responsibility of the socio-economic levels is overwhelming. Life expectancy has doubled at the end of the twentieth century in some developed countries. Life expectancy at birth exceeds 78 years in 28 countries. In 2000, the life expectancy at birth was 80.7 in Japan, 79.6 in Sweden, 78.8 in France, 77.7 in the UK, 77.1 in the USA, 71.4 in China, 67.2 in Russia, 62.9 in Brazil, 62.5 in India, 48.0 in Kenya, 37.8 in Zimbabwe and 37.6 in Malawi.

Poverty, poor sanitation, under nutrition, epidemic (HIV-AIDS) may explain these differences. In some countries such as Russia, a decline in life expectancy is attributed to a combination of factors including homicides, excessive alcohol consumption, poor diet and workplace degradation.

The positive correlation between health, attested by the mean life expectancy, and income per capita is well known. As underlined by the economist David Bloom, this positive correlation is commonly thought to reflect a causal link running from income to health. Indeed, a higher economic level allows access to goods and services that promote health (nutrition, sanitation, skilled health services, prevention…).

David Bloom and some other economists develop a very interesting new hypothesis. They propose that the income-health correlation could be partly explained by a causal link running the other way :►From health to income.

Health improvement could lead to income growth due to several mechanisms:

Productivity: Health improves productivity due to more energy and mental force, fewer lost workdays from illness or need of care for other members of the family.

Education: Healthier populations invest more in education that in turn promotes greater productivity and income. Higher education is correlated to better function and long term preservation of cognition. Higher education is also linked to a better compliance to prevention.

Investment in physical capital: An increased longevity leads to long term investment and saving that, in turn, stimulates economy.

Demographic dividend : The transition from high to low rate of mortality is correlated to the progressive reduction in the high fertility rate observed in developing countries

Recent economic analysis indicates that health status as measured by life expectancy is a significant predictor of subsequent economic growth. As stated by Bloom and Caning, when comparing two countries identical in all respects, except one has a 5-year advantage in life expectancy, it has been proven that the income per capita will grow 0.3 to O.5% per year faster in the country with the highest longevity.

Particularly important are the links between health, wealth and the necessary fight against poverty.

Health improvement increases the labour power, fortifies the economy, thus, and alleviates poverty.
This process is particularly beneficial for the less wealthy part of the population who heavily depends on labour power.
Increases in average income of a nation, translate (% point by % point) into increases in income for poor people.
Improvements in health status accelerate the demographic transition by decreasing the child mortality and increasing the working age population.
In East Asia : Health improvement due to Antibiotics, Chloroquine, DDT, safe water and sanitation probably accounts for a large part of the fantastic economic boom.
On the contrary, poor health in sub-saharian Africa creates a high fertility-high mortality trap that prevents economic growth.

In developed countries medical progress, prevention and healthy lifestyles are determinants of health throughout life and preservation of function.
Indeed, most of age-related diseases may be related to modifiable risk factors and then accessible to prevention (Cardiovascular diseases, strokes, dementia (Alzheimer's disease), arthritis, osteoporosis, diminished hearing and vision, cancers etc…).

On going medical progress will boost prevention (ADN chips, cell therapy, biotechnologies…).

Let us take the example of hypertension related to cardiovascular complications at all ages. The randomised trials have demonstrated that treatment of hypertension significantly reduces the incidence of strokes and other cardiovascular complications. In the meta analysis by Inshua, the relive risk for strokes is decreased by 35%, for cardiovascular complication by 25% for total mortality by 12%.

Prevention of cardiovascular diseases remains the privilege of the most developed countries. A recent WHO report for Europe shows that the gap between western and eastern Europe is increasing. People in western Europe may expect to live 6 years longer than people in central Europe and 10 years longer than people of the New Independent States born after the dissolution of the Soviet Union. In eastern Europe, cardiovascular diseases represent 60% of the mortality causes as compared to 35% in western Europe. The huge decrease in the cardiovascular mortality from east to west emphasizes the absolute need for cardiovascular prevention in all countries

Another way to promote healthy aging would be to prevent dementia and particularly Alzheimer's diseases. Given the expected increase with age of incidence of these disorders, prevention has turned into a major health challenge.
Preventive approaches rely on the identification of risk factors, such as age and gender, low level of education, genetic factors (family history of AD or genotypes as ApoE4, prior minor cognitive impairment and vascular factor such as hypertension.
Some of them cannot be modified. In contrast, Vascular risk factors and, in particular but not only hypertension, may be the target of prevention trials.
Prevention using estrogens, anti-inflammatory agents, anti-oxidants and cholesterol-lowering agents remains to be confirmed, but interesting lessons may be learned from antihypertensive trials.
Two randomized studies were able to demonstrate a reduction in the incidence of dementia. In Syst-Eur, after two years, there was a significant, 50% reduction in the incidence of dementia. Interestingly, Alzheimer's dementia was reduced as well as vascular and mixed dementia. In PROGRESS, a significant 34% reduction of stroke-related dementia was observed in the group actively treated with ace-inhibitor and diuretic..
In conclusion, association between high blood pressure, vascular risk factors and later dementia underlines the possibility of preventive intervention. Syst-Eur and PROGRESS studies have demonstrated that blood pressure lowering agents significantly reduce the incidence of dementia.
Is it possible to go further and act on the cause of Alzheimer'sdisease.

Based on the amyloid hypothesis, two approaches are being tested. First the development of beta and gamma secretase inhibitors, but this procedure seems to be rather complicated and to my Knowledge, the studies are nor yet in phase 2.
The second hypothesis is based on the beta-amyloïd immunisation. The original work by Dale Schenk on transgenic ADAPP mice engeneered to produce human A beta amyloid protein was spectacular. Our group participated in the first phase 2 trial of the amyloid vaccine, but the study was stopped due to severe side-effects. Nevertheless some papers show that fragments of the A beta protein could produce the same effect without the immune inflammation.
All these studies show that the key of Alzheimer prevention maybe is not too far ahead. This is a fantastic hope for the future.

The Alliance for Health & the Future envisions a society that thrives because all people, regardless of age, enjoy healthy, fulfilling lives, at home, at work, and in their communities.
The Alliance will encourage greater societal awareness of issues related to healthy ageing.
To promote longer and fuller lives, the Alliance will foster healthy lifestyles, quality healthcare, and economic security.

To impart the necessity of sharing responsibility, the Alliance will build relationships among individuals, communities, organizations, and governments.

The Alliance will advance knowledge and provide training, skills, and systems to help every person, and society as a whole, realize a healthy future

Facing this longevity revolution, our ethical and political challenge is to maintain equity and promote health, wealth and quality of life of all generations living together. Guarantee that economical pressure does not compromise the rights of the expanding aging population. Guarantee that the North and the South of the planet will equally benefit of the fantastic venture of Longevity.