

Brain function - A new way to measure the burden of aging across nations

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Cognitive function may be a better indicator of the impact of aging on an economy than age-distribution, with chronological age imposing less of a social and economic burden if the population is "functionally" younger, according to a study published today in the *Proceedings of the National Academy of Sciences*.

The study finds that one standardized indicator of cognitive ability - [memory recall](#) - is better in countries where education, nutrition, and health standards are generally higher. Aging populations are of concern to many countries as it is often assumed that ageing necessarily implies a greater cost to society in terms of aged care, age related disease, and reduced capacity to contribute to society.

However this research suggests that the effects of chronological aging are uneven across nations and that in some countries, particularly more affluent ones that are able to invest in early and sustained education and health programs, cognitive function and thus the ability to live healthy, productive lives, is maintained longer.

"Demographic indicators of the economic impact of an [aging population](#) typically rely on measures based on populations' age-distribution, expressed as the Old Age Dependency Ratio (OADR). Whilst this is helpful measurement it does not include information on individual characteristics, other than age," says lead author Vegard Skirbekk from the International Institute for Applied Systems Analysis (IIASA).

"We believe cognitive function can provide a new and comparable measure of how a region or a nation's population may age. Such information can inform early intervention in the education and health systems to try and improve [cognitive performance](#), ultimately reducing the burden of aging."

"For example, in [northern Europe](#) or the United States where there is a relatively large population over the age of 65, we found that cognitive function is higher for this age group than for the same age group in Mexico, India and China. Overall, even though Europe and the US may be chronologically older they are 'functionally' younger."

Cognitive ability levels are also good indicators of individual productivity and this has direct relevance to the economic and business activities within a country.

The authors suggest that the difference in cognitive function may be explained by the fact that seniors in some regions of the world experience better conditions during their childhood and adult life; including nutrition, duration and quality of schooling, exposure to disease, and physical and social activity.

The study involved surveys of people aged over fifty years from a range of countries including the United States, Mexico, India, Japan, and across Europe, from both urban and rural areas. The surveys measured, among other parameters, short-term memory, or the ability to immediately recall words read-out to the participants. Immediate recall has been shown to influence decision-making ability and the risk of dementia.

According to the authors, because aspects of [cognitive functioning](#) at older ages can now, for the first time, be more readily compared, such a measurement may also serve as a benchmark for countries to assess the burden of aging across nations.

More information: Vegard Skirbekk, Elke Loichinger, and Daniela Weber: Variation in cognitive functioning as a refined approach to comparing aging across countries. *Proceedings of the National Academy of Sciences (PNAS Early edition Article no 201112173)*.

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