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Narratives of Ageing Well: Magic, Dreams and Hopes

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Abstract

Narratives of ageing refer to descriptions of positively evaluated endpoints of growing old. The benchmark in ageing research is Rowe and Kahn's model, which defines successful ageing as maintaining good health, adequate fitness and productive activity into old age. The biology of ageing recently has added narratives (and empirical research) on healthy ageing in respect to extending longevity and rejuvenation. For a large portion of the population, frailty and cognitive impairment is the reality of ageing, and it is by no means certain if health promotion, prevention and other interventions will make it disappear. In addition, social inequality has shown a major impact on longevity and health in old age. Moreover, acknowledging diversity could lead to varying definitions of ageing well. Striving for ageing well should be inclusive, acknowledging different forms and pathways of ageing. Conceptions of ageing well can vary widely, and may include not only good health and functioning, but also life-satisfaction, wisdom, supporting environments, and good care.

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Narratives of Ageing Well: Magic, Dreams, and Hopes

Narratives of ageing well refer to descriptions of how we would like to live our lives up to very old age – until we die. Setting positive endpoints of growing old is an almost unavoidable endeavor in ageing research: Explicitly or, more often, implicitly we normatively define what is ageing well by choosing certain outcomes in our research. The benchmark of ageing well is Rowe and Kahn's model[1], which defines successful ageing as maintaining good health, adequate fitness and productive activity into old age. In this paper I will sketch and discuss several narratives of ageing well in terms of philosophical traditions that describe a good life: pragmatist, hedonic, eudaimonic, capability-related, and care ethics-based approach.

1 A myth, a legend, and a fairy tale on ageing well

The myth of Tithonos[2]

Eos, the goddess of dawn, was in love with a beautiful man, the young Tithonos. While she was immortal as a goddess, he as a human had eventually to die. Eos wanted to spend the rest of eternity with Tithonos. So, what to do? She went to the father of gods and asked Zeus for Tithonos' immortality. Zeus smiled and did some magic. Tithonos was now immortal and the two married. The years passed and Tithonos did not die. But what happened? Greying, then white hair, a stooped gait, loss of hearing: Tithonos was getting old. Eos had forgotten to ask for eternal youth. A sad end: Tithonos grew old and older, but could not die. In his pain, he wailed miserably until Eos couldn't bear it any longer and locked him away. In a milder version of the myth, she enchanted him into a cicada, and Tithonos' whimpering turned into the whirring of summer.

The legend of the fountain of youth [3]

This very old legend became widely known in the 16th century when Juan Ponce de León discovered Florida while dreaming of and searching for the Fountain of Youth. Lucas Cranach the Elder painted the Fountain of Youth in 1546 as a basin with a column in the centre. Old people are climbing into the fountain from the left and leaving it rejuvenated to the right. All kinds of old people? Well, Cranach painted old women, only. They are driven, carried, pushed or dragged to the fountain, mostly by men. In the left part of the fountain, old women are bathing; on the right, young women are emerging from the pool, in the beauty ideal of Cranach's time. And what about old men? They are waiting on the right, waiting for the young women to leave the bath. Old men rejuvenate while dancing with young women – or disappearing with them behind a bush. What a sarcastic comment on gendered beauty expectations!

The fairy tale of successful ageing

Successful ageing – this is the hope of staying healthy, being active and remaining socially integrated until very old age. You add years to your life, but you never grow old with chronic illness and disabilities. After decades and years of productive activities and engagement the end of life comes gently and without disturbance. One evening you go to bed, and the next morning

you have passed away peacefully. This is the hopeful tale of successful ageing: A fulfilled life into old age is possible. The end of life has lost its horror, and the lesson is that we can – and should – do our best to stay healthy and fit until we die.

Finitude of life and health in old age

Three conceptions of ageing well, and they all combine the topics 'finitude of life' and 'health' to define ageing well:[4]

- The myth of Tithonos tells the story of a revolt against death. For Eos, ageing well is living forever. Unfortunately, she forgets that for humans, good health is required for joyful immortality. So, the lesson of the myth: Be careful what you wish for, mortal. And the same goes for you, goddess.

- The legend of the Fountain of Youth states that ageing well is not ageing at all. It's all about youthfulness, and youthfulness, again. The legend, however, does not say anything about death. How often are you allowed – or wish – to jump into the water? Once, twice, three times? Ten, a hundred, a thousand times? On the eve of your millionth bath, you may say 'not again!', and kill yourself. Or less dramatically, you do not step into the fountain again, grow old, and eventually perish. Lucky you. Tithonos was not allowed to die.

- The fairy tale of successful ageing seems to be the respectable cousin in this dodgy family of stories on ageing well. Finitude of life is accepted, and the preservation of good health lies in our hands. Healthy ageing up to a gentle death – isn't that what we all hope for?

2 What current ageing research has to offer

Interestingly, all themes of myth, legend, and fairytale are represented in current research programs on ageing. I see three strands of ageing research, focusing on extending longevity, improving late-life health, and compressing morbidity.

Extending longevity

I would dare to say that Jim Vaupel's bold claim that limits of life expectancy have been broken in the past[5] and his straight line right into eternity in Figure 1 of the famous publication with Jim Oeppen challenged the biological wisdom of the Hayflick limit.[6] Vaupel's research suggest that life might not be eternal, but limits for life expectancy are not in sight yet. While at the heyday of Vaupel's longevity optimism some prominent scholars in biology of ageing would not attend conferences with Vaupel presenting, times have changed.

Now, biologists test pharmaceutical interventions in order to extend the life-span.[7] This could be achieved with, for instance, measures to switch off senescent cells or to preserve telomeres. Researchers at the Max Planck Institute for Biology of Aging in Cologne could show that the combination of two cancer drugs – Rapamycin and Trametinib – extends both life-span and health-span of mice.[8] And the Leopoldina, the German National Academy of Sciences, has

published a manifesto on the need to fund biological ageing research on the extension of both health and life-span. The authors claim that 'geroprotective medicines, i.e. medicine that treats the ageing process rather than individual diseases' would help to increase longevity in good health.[9] Modern biology promises to provide the Thitonos story with a happy ending.

Improving late-life health

For decades, anti-ageing medicine was the domain of charlatans and swindlers.[10] Not anymore.[11] Anti-ageing interventions are now discussed under the heading of 'rejuvenation'. Biological rejuvenation aims to restore health and function of cells, organs or the organism on a systemic level. An example of a rejuvenation strategy is 'heterochronic transplantation' which involves transplanting tissues, cells, or organs from a younger to an older individual. In a typical experiment, two mice, one old and one young, have been surgically connected to share a common blood circulation system, helping the older mouse to become younger – and the younger to become older. Even brain rejuvenation strategies are discussed.[12]

Behavioral and social sciences contribute strategies to improve late-life health, as well. 'It's never too late!' is the motto of health promotion and prevention.[13] While health promotion aims at preserving somatic health and functional abilities, prevention is targeted to specific diseases like stroke, type 2 diabetes, or coronary heart disease. Both approaches aim at changing habits and lifestyle, such as diet and exercise, but also use medical interventions like vaccines and screenings. Many studies show positive, although limited effects of health promotion and prevention on autonomy and quality of life in old age.[14]

Ageing well means, both from the perspective of biological rejuvenation as well as from health promotion and prevention, to maintain or even restore good health in old age – a modern fountain of youth.

Compression of morbidity

Accepting the finitude of life is the unique selling point of the concept 'compression of morbidity'.[15] James Fries developed the idea to delay and compress age-related illnesses until shortly before the end of life. This concept is the magic formula in the standard model of successful ageing. Jack Rowe and Robert Kahn define successful ageing as good health, fitness and active participation into old age.[16] Independence, self-determination and integration into the fabrics of social networks and society until the end of life are the hallmarks of successful ageing. To reach this goal, health promotion and prevention are necessary on an individual and societal level. Rowe and Kahn's model has been highly successful, and still is the benchmark in research on ageing well.[17]

Recently, Jay Olshansky and James Kirkland have suggested a similar idea under the term 'geroscience'.[18] Contrary to the demographer Vaupel, these biologists claim that maximum average life-span of humankind is reached by now: it is about 85 years.[19] Not the life-span should be extended, but the health-span within these limits. Proponents of geroscience recommend a mix of life style changes and pharmaceutical interventions for extending the health-span within the given time horizon of the human life-span – clearly very similar to the concept of successful ageing.

Ageing well as healthy, active ageing

All three strands of ageing research are highly similar in emphasizing good health in old age. There are differences, however, in their stance toward the finitude of life. Rejuvenation interventions not necessarily aim at the extension of the life-span, while longevity interventions usually do not aim to reverse biological age.[20] The idea of morbidity compression accepts finitude of life, but it is not clear if there is the fixed limit of life expectancy. Why should a healthy organism die, even in very old age? Modern biology of ageing has rejected the idea of a genetically programmed time of death. Strategies of morbidity compression might also prolong the life-span – and lead the idea of morbidity compression into a void.

3 Victory over or denial of old age?

Research programs of healthy, active ageing optimistically claim that decline in old age may be overcome and that good health will triumph in and over old age. It is highly probably, that research in the biology of ageing will lead to deep insights into the basic processes of ageing. It also seems likely that pharmacological interventions be developed which restore health in old age and which even might extend the human life-span. Artificial intelligence will contribute to improve making diagnoses and targeting therapies. But will gerontology be victorious and eliminate chronic illnesses and multimorbidity? There are good reasons to doubt this optimism. These doubts refer to the prevalence of frailty, social inequality, over-emphasis of individual responsibility, and value judgements.

There is no absolute compression of morbidity. [21]

Over the last decades of the 20th century life expectancy in most countries worldwide have increased. This has been tied to societal progress and higher societal prosperity.[22] Demographic and epidemiological research shows, however, that the increase in life expectancy in recent decades is not solely due to the increase in 'years in good health'. There has also always been an increase in the number of 'years in ill health', years with multiple illnesses and need for support.[23] Hence, there is no absolute compression of morbidity, as predicted by the original hypothesis of James Fries, but relative compression of morbidity. The gain of healthy years is higher than the gain of years in ill health – but years in ill health do not disappear.

On the contrary: Chronic illnesses, multi-morbidity, and frailty have been postponed in later life and the years in dependency have even increased. Recently, research has shown that in later born cohorts a larger proportion of late life is spent with disabilities.[24] Jack Rowe's optimism has decreased over the last 40 years, between the original publication in 1987 and today.[25] Also the number of older persons in need of care[26] and the prevalence of Alzheimer's disease increases.[27] Moreover, and in respect to our very own future as individuals, it has been shown that the life-course probability that each of us will need care at some time in the course of our lives is quite high.[28]

Will the insights and innovations in biological ageing research change this situation? It is too early to make an informed judgment as evidence on studies involving humans are still lacking to my

knowledge. What we know so far comes from animal studies and shows short-term effects of pharmacological interventions. It is indispensable, however, to study not only the immediate effects of longevity or rejuvenation interventions, but also their long-term consequences. It is by no means certain that the effects last and that health-span is extended. It is not unconceivable that frailty does not disappear but is postponed to higher ages and may last longer in the future.

We probably need to realize, as individuals and as societies, that many people will grow old with chronic illnesses, multi-morbidity, and frailty, at least for the foreseeable future. Wouldn't be necessary to think about concepts for ageing well which go beyond staying healthy and active?

The opportunities for healthy and active ageing are unevenly distributed

Immortality and everlasting youth were discussed by Vladimir Putin and Xi Jinping during a military parade in Beijing in September 2025 year. The discussion was overheard by Chinese State Television and translated by the BBC.[29] While Xi claimed that a life expectancy of 150 years would be likely achieved in this century, Putin spoke about immortality and everlasting youth which could be gained by innovations in biotechnology and repeated organ transplants. While it is not sure if Putin will live longer by repeatedly getting new organs via 'heterochronic transplantation', it is certain that the necessarily young (and probably poor) organ donors will not reach immortality. Rejuvenation and longevity interventions for powerful, rich and ruthless leaders, only?[30] This is speculation, maybe not quite unfounded, but unproven at the moment. Nevertheless, this example shows that longevity and rejuvenation interventions come with a plethora of moral, legal, and political questions – and a likely increase in societal inequality.[31]

Empirical evidence on social inequality has been collected in respect to successful ageing. Research in the social sciences has shown that social inequality has a major impact on the chances for a healthy, active ageing. People with a high level of education, high income and powerful prestige[32] have significantly greater chances of growing old healthy, fit and active than people who have only limited financial and educational resources.[33] Healthy and active ageing seems to be the privilege of the already privileged.[34] Successful ageing as defined by Rowe and Kahn is the domain of the 'happy few'. How could we conceptualize ageing well for those who do not belong to dominant societal groups?

It is insufficient to emphasize individual responsibility for healthy and active ageing.

Individual responsibility is central to successful ageing. The idea of successful ageing comes with the conviction that health in old age lies in your own hands: Your own behavior, your beliefs about old age determine how you grow old.[35] Hence, it can be assumed that it is an individual's fault if they are sick, frail, cognitively impaired in old age.

The strong emphasis on individual responsibility in healthy ageing is naïve. Being poor is not a trait, it is part of societal inequality. Stratification and inequality might be inherently tied to any social system and is probably tied to individual characteristics, but the extent of societal inequality and its consequences can be influenced by social policies – or the lack thereof. Neighborhoods and physical environment are also indispensable for ageing well. Hence, it might be necessary to integrate environmental and societal factors into definitions of ageing well.

The dichotomy of ageing in good and poor health devalues older people with limitations.

Finally, a purely normative argument. Using terms like healthy, active, successful ageing suggest a dualism of positive and negative evaluations. Positive evaluations go to old people who are healthy, active, and productive, take care of themselves, and do not burden younger people. Negative evaluations go to old people who are sick, functionally impaired and socially isolated. These are counted as 'unsuccessful failures in ageing', in contrast to the healthy, active, lucky 'successful agers'. Focusing on the 'bright side of ageing', the 'dark side of ageing' is made invisible. The guiding principle of healthy and active ageing goes hand in hand with the devaluation of frail older people with multimorbidity, the need for care and dementia.

4 Diversity, equity, and inclusion

The concept of successful ageing stands within the philosophical tradition of pragmatism. John Dewey defined a good life as leading an active life,[36] altering one's circumstances in order to fit one's goals and plans. I argue, that the pragmatist narrative of ageing well is not sufficient for a broad, inclusive definition of ageing well. Many will grow old in ill health, especially those living in disadvantaged situations. Hence, I would like to discuss alternative narratives of ageing well, based in other philosophical traditions: the hedonic, eudaimonic, capability-related, and care ethics-based narratives of ageing well.

Hedonic concepts of ageing well

Hedonic concepts of ageing well have a long tradition in gerontological research. Instead of defining the criterion for ageing well from the outside in normative terms (health!, fitness!, productivity!), the hedonic concept uses subjective definitions, as people's goals and values differ. A person's subjective well-being is used to measure ageing well.[37] Those who age well are those who are satisfied and happy with their lives. In research and practice, the hedonic concept is a fierce competitor to the standard model of successful ageing, but it also has its problematic aspects. Remember the idea of the hedonic treadmill: people generally get used to adverse circumstances and return to their original level of happiness and satisfaction. Low variance and high stability do not make satisfaction measures useful indicators of a good life in old age – they possibly show the high resilience of individuals having grown old.

Eudaimonic concepts of ageing well

Eudaimonic definitions of ageing well refer to personal growth into old age. The developmental tasks of old age include accepting the finitude of life, age related losses that make everyday life more difficult and the unrelenting finality of decisions made in younger years. A person's biography, with all its ups and downs, is the life they have lived. Ageing well consists of developing insight into life, wisdom and ego integrity.[38] The prerequisite for wisdom is a sharp mind, however: Health in old age is important in this definition, as well. In addition, insight, wisdom and ego integrity are difficult to measure, which is why the eudaimonic concept is more often found in theoretical discussions and advice books than in empirical research.

Capability-related concepts of ageing well

All definitions of ageing well discussed so far – the standard model of healthy and active ageing, the hedonic model and the eudaimonic model – view ageing well as an individual achievement. Capability-related concepts of ageing well focus on the opportunity structures in which people live. The term 'capability' comes from the economist Amartya Sen[39], and the terms he uses differ greatly from the language used in the social sciences. For the sake of simplicity, I translate the term 'functions' as goals, the term 'commodities' as resources and the term 'capability' as opportunity structures. Combinations of individual resources and environmental opportunity structures create a space of options for an individual to be or do what they value. An older person who, despite their declining abilities, is enabled by appropriate opportunity structures to pursue their individual goals can be considered to be ageing well[40]. In contrast, a person who – although highly capable – is prevented from pursuing their goals by barriers would have to be regarded as ageing poorly and unhappily. In this perspective, ageing well is not an achievement of the individual alone, but rather the result of a fit between the individual and their environment – in other words, a collective achievement. Again, unfortunately, it is difficult to measure this type of ageing well, unless one asks about satisfaction with the life situation and thus approaches in terms of measurement the hedonic model already outlined.

Care-related concepts of ageing well

Care-related concepts of ageing well should also be seen in terms of community and society. The noun 'care' goes beyond 'health care'; it refers also to 'concern' and 'support'. The philosophical approach of 'care ethics' emphasizes the importance of social relationships and mutual responsibility for moral action. Care-related approaches to ageing well take for granted that old age comes with morbidity and the need for care. It also takes into account the fact that help and care play a central role in the lives of everybody, not only older persons, and that ageing well can be constituted by good care.[41] In this perspective, ageing well consists of the joint efforts of those in need of care and their carers to maintain the self-determination and quality of life of an older person in need of care. Here, too, it is difficult to measure – nursing science can tell you a thing or two about it.

5 Now what?

The title of this paper is 'Narratives of ageing well'. Isn't it a bit unfair to characterize solid and respectable research programs on longevity and health in old age as 'narratives', unfalsifiable assumptions and beliefs? And isn't it even more unfair to accuse them of fostering hope, encourageing dreams, using magic? Yes, it is – and I sincerely apologize for this brazen chutzba. If, however, research in biology, medicine, and health sciences promise to solve the challenges of ageing societies, chutzba exists here as well – in taking on a task for which these disciplines are not well equipped.

Saving ageing societies

Above, I have cited a manifesto published by the German Academy of Sciences, the Leopoldina, with the claim that geroprotective medicines would help to increase longevity in good health. The citation continues, however: These geroprotective medicines could also foster an 'inclusive, healthy ageing society'[42], an example for the hopes of modern ageing research in the life sciences. However, proponents of research on longevity and rejuvenation rarely think about societal preconditions and consequences if their plans would be translated into policies.[43]

So, would interventions for longevity and rejuvenation save ageing societies? Consider, for instance, the funding of longevity and rejuvenation interventions. Who is paying for them and who gets access? If these interventions are part of the health care systems, increased cost would result, at least initially. If private payments are required, access to geroprotective medicines will increase social inequality. People with sufficient financial means would possibly live longer and healthier than more disadvantaged people. And what are the consequences of these rejuvenation and longevity interventions? The prolongation of the life-span of even a few decades would change societies profoundly. Nobody knows how the newly added years or decades of the life-span will be spent: In perfect health? Or in ill health, with the usual and possibly new burdens of old age? If frailty is part of the 'conditio humana', magic, dreams, and hope for healthy ageing may be just illusions.

Striving for inclusive societies

In total, I have presented eight narratives of ageing well.[44] These eight narratives can be divided into two groups.[45] On the one hand, there are three types of 'healthy and active ageing': extending longevity, improving late-life health, and compression of morbidity. On the other hand, there is the Tithonos group: the myth of the eternally suffering demigod is joined by four tales of Tithonos as mortal man. In the hedonic model, Tithonos must be imagined as happy, in the eudaimonic model as wise. And finally, we see a better world in which an incapacitated and frail Tithonos could grow old and age well: He is not locked away, but lives in an environment with opportunities for participation and receives good, respectful care.

Eight narratives, and which is the best to describe ageing well? My answer would be: Not one, but all of them. Of course, growing old in good health is desirable. But this ideal should be combined with the principle of 'even if'. Even if we get frail, there should be the potential for ageing well. Similar considerations lead to the 'Convention on the Rights of Persons with Disabilities' which after years of discussion was drafted in 2006 and went into effect in 2008. Persons with disabilities should be given the full enjoyment of human rights – a task of states, civil societies, and everybody with or without disabilities. Similarly, a Convention on the Rights of Older Persons should guarantee the full enjoyment of human rights for older people, regardless of their health and fitness. Such a convention has been discussed for more than a decade now, but it hasn't been drafted, let alone being passed yet.

Let me finish my contribution with two episodes, one I experienced just recently, the other one more than 20 years ago. Both episodes involve the personal expectation of getting Alzheimer's disease in old age – a threat to the identity of each and everybody, but especially so for researchers and academics who hold their cognitive capabilities in high esteem. What would we

do when we were sure that Azheimer's will come to us in our old age? Two completely different answers to this question.

– The first answer. A Dutch friend of a friend of mine mentioned that his father made a living will. In this will, the father defined circumstances under which he would want to leave this world. One of the conditions he listed was the diagnosis of Alzheimer's dementia. If he would not be able to commit suicide anymore (even assisted suicide), he asked for active euthanasia, tolerated under certain circumstances under Dutch law.[46] That is the downside of the ideal of healthy ageing: If health and functioning are seen as indispensable, life becomes unworthy of living when frailty and cognitive decline sets in, and death is conceived as the only remedy.

– The second answer: Many years ago, I was a member of a commission tasked with presenting a report on old age to the German Federal government. This report had a focus on dementia.[47] In one of the meetings, when the commission talked about fears of dementia, the psychiatrist Jan Wojnar mentioned that he wasn't worried at all, but was looking forward to his dementia. A new life, full of discoveries. For Jan Wojnar, life up to very old age was worth living even if – or maybe even because – the potential of developing Alzheimer's dementia.

Not all of us may will feel happy thinking about a personal future involving dementia. But with high certainty, we as individuals will change with age – and new selves will be part of our lives. Maybe those who value themselves being frail and in need of support can also value frail old people and strive for inclusive societies which allow different kinds of ageing well.

ENDNOTENVERZEICHNIS

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[2] The myth of Tithonos comes from the Homeric hymn to Aphrodite (verses 218-238). Schwenck, K. (1825). The Homeric Hymns. H. L. Brönner. http://www.deutsche-liebeslyrik.de/europaische_liebeslyrik/homerische_hymnen.htm

[3] The fountain of youth has much older origins like in the writings of Herodotus (5th century BC) or in the Alexander Romance (3rd century AD). It still inspires the arts, e.g. a 1956 television pilot directed by Orson Welles, and a 2025 action thrille by Guy Ritchie. The painting by Lucas Cranach the Elder can be found in the Berlin Gemäldegalerie.

[4] "If death is a natural part of life, the quest for immortality has existed since the beginning of human history. From the Epic of Gilgamesh, about a mythological king who embarks on a long journey in search of eternal life after the death of his best friend, to Qin Shi Huang, China's first emperor, desperate to find the elixir of immortality, to Juan Ponce de León, a Spanish explorer who sought the fountain of youth, stories of the pursuit of immortality are countless". Madanamoothoo, A., & Schoch, P. (2024). The quest for the Benjamin Button effect in Silicon Valley: Bioethical and ecological issues posed by the longevity and immortality industry. *Médecine & Droit*, *2024*(187), 73-76. https://doi.org/https://doi.org/10.1016/j.meddro.2024.05.001

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[6] Hayflick, L. (2016). Unlike ageing, longevity is sexually determined. In V. L. Bengtson & R. Settersten Jr (Eds.), Handbook of theories of ageing (3 ed., pp. 31-52). – The Hayflick limit may not apply to species like Hydra, but it clearly does to humans

[7] "Several therapeutic strategies targeting these hallmarks [of ageing] are currently being investigated, including senolytics to selectively eliminate senescent cells, senomorphics to inhibit the senescence-associated secretory phenotype (that features, e.g., inflammatory cytokines), telomerase activation to prevent telomere shortening, epigenetic modifiers to reverse age-related epigenetic changes and mitochondrial-targeted treatment to restore mitochondrial function" (p. 356; Simm, A., Großkopf, A., & Fuellen, G. (2024). Detailing the biomedical aspects of geroscience by molecular data and large-scale "deep" bioinformatics analyses. Zeitschrift für Gerontologie und Geriatrie, 57[5], 355-360). Examples of drugs that are currently being investigated include the cancer drug dasatinib in combination with quercetin - this goes far beyond anti-ageing medicine (e.g. the German Society of Anti-Aging Medicine, https://www.gsaam.de/), which advertises its therapies but has little or no evidence of their long-term effects.

[8] Gkioni, L., Nespital, T., Baghdadi, M., Monzó, C., Bali, J., Nassr, T., Cremer, A. L., Beyer, A., Deelen, J., Backes, H., Grönke, S., & Partridge, L. (2025). The geroprotectors trametinib and rapamycin combine additively to extend mouse health-span and life-span. Nature Aging, 5(7), 1249-1265. https://doi.org/10.1038/s43587-025-00876-4

[9] Schumacher, B., Antebi, A., Geiger, H., Krieg, T., Maier, A., Morrison, H., Niedernhofer, L., Niehrs, C., Scharffetter-Kochanek, K., & Scheibye-Knudsen, M. (2025). Health-Extending Medicine in an Aging Society: Perspectives of Medical Research and Practice. Leopoldina. https://doi.org/10.26164/leopoldina_03_01272. In the Executive Summary the authors state: "We propose that the scientific research excellence in the field of ageing biology in Germany provides a strong foundation for developing geroprotective medicines, i.e. medicine that treats the ageing process rather than individual diseases, to maintain lifelong health and prevent disease, thus fostering an inclusive, healthy ageing society".

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[13] In the beginning of the 21st century, there were quite a few declarations and special issues with overviews on this topic, e.g. Morley, J. E., & Flaherty, J. H. (2002). Editorial It's Never Too Late: Health Promotion and Illness Prevention in Older Persons. The Journals of Gerontology Series A: Biological Sciences and Medical Sciences, 57(6), M338-M342. https://doi.org/10.1093/gerona/57.6.M338 and Goetzel, R. Z., Reynolds, K., Breslow, L., Roper, W. L., Shechter, D., Stapleton, D. C., Lapin, P. J., & McGinnis, J. M. (2007). Health promotion in later life: It's never too late. American Journal of Health Promotion, 21(4), 1-8.. https://doi.org/10.4278/0890-1171-21.4.TAHP-1 Currently, the general idea of health promotion and prevention is tested using a variety of different interventions in highly diverse groups of older people.

ENDNOTENVERZEICHNIS

[14] A scoping review found over 300 systematic reviews and meta-analyses on health promotion and prevention published since 2000, of which about two thirds involved individuals 55 years and older (Duplaga, M., Grysztar, M., Rodzinka, M., & Kopec, A. (2016). Scoping review of health promotion and disease prevention interventions addressed to elderly people. BMC Health Services Research, 16(Suppl 5), 278. https://doi.org/10.1186/s12913-016-1521-4) .

[15] Fries, J. F. (1980). Aging, natural death, and the compression of morbidity. The New England Journal of Medicine, 303, 130-135. https://doi.org/10.1056/NEJM198007173030304

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[17] The Gerontologist: Issue on Successful ageing (Volume 65, Issue 1, January 2025)

[18] Olshansky, S. J., & Kirkland, J. L. (2024). Geroscience and Its Promise. Cold Spring Harbor Perspectives in Medicine, 14(8), a041725.

[19] Olshansky, S. J. (2022). From life span to health span: declaring “victory” in the pursuit of human longevity. In J. L. Kirkland, S. J. Olshansky, & G. M. Martin (Eds.), Aging. Geroscience as the New Public Health Frontier (Vol. 12, pp. 1-12). Cold Spring Harbor Laboratory Press. https://doi.org/10.1101/cshperspect.a041480. On page 4: ‘With regard to the human life span, there is theoretical,empirical,andbiological justification to conclude that the human life span is about 85 years for men and women combined and maximum life span is currently 122 (Robine et al. 2019)—but this maximum might increase slightly in the coming decades with larger cohorts moving through the age structure (de Beer et al. 2017). There is empirical evidence to suggest that it will continue to be rare to have humans live beyond the age of 115 (Dong et al. 2016)’.

[20] Zhang, B., Trapp, A., Kerepesi, C., & Gladyshev, V. N. (2022). Emerging rejuvenation strategies—Reducing the biological age. Aging Cell, 21(1), e13538. https://doi.org/10.1111/acel.13538

[21] It is the convergent opinion in the biology of ageing, that the duration of life is not regulated by a ‘genetic clock’. If there was such a genetically set limit of the life-span at, say 80, 90, or 100 years, nobody would live beyond this age (at least not more than a few years). On the other hand, evolution could not have developed a limit of the life-span at much higher ages, say 200, 300 or 1,000 years, because all humans die before this age.

[22] Countries where life-expectancy has decreased often have experienced societal crises, like the AIDS epidemic in Lesotho.

[23] Salomon, J. A., Wang, H., Freeman, M. K., Vos, T., Flaxman, A. D., Lopez, A. D., & Murray, C. J. L. (2013). Healthy life expectancy for 187 countries, 1990–2010: a systematic analysis for the Global Burden Disease Study 2010. The Lancet, 380(9859), 2144-2162. https://doi.org/10.1016/S0140-6736(12)61690-0

[24] Geyer, S., & Eberhard, S. (2022). Compression and expansion of morbidity: Secular trends among cohorts of the same age. Deutsches Ärzteblatt International, 119(47), 810. https://doi.org/10.3238/arztebl.m2022.0324

[25] Rowe, J. W. (2025). Will Tomorrow’s Older Persons Age as Successfully as Their Parents’ Generation? The Gerontologist, 65(1), gnae162. https://doi.org/10.1093/geront/gnae162

[26] In Germany, the number of people receiving benefits of the German Long-Term Care insurance has grown from less than 2 Mio persons in 1999 to more than 5.5 Mio persons in 2023. Note, that persons of all ages may receive benefits, but more than 95 percent of beneficiaries are 70 years and older. It has to be added, that there is no medical diagnosis of frailty used, but criteria based on political considerations. Source:, https://www-genesis.destatis.de/datenbank/online/statistic/22421/table/22421-0001 retrieved 15.09.2025

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[27] Wolters, F. J., Chibnik, L. B., Waziry, R., Anderson, R., Berr, C., Beiser, A., Bis, J. C., Blacker, D., Bos, D., Brayne, C., Dartigues, J.-F., Darweesh, S. K. L., Davis-Plourde, K. L., de Wolf, F., Debette, S., Dufouil, C., & et.al. (2020). Twenty-seven-year time trends in dementia incidence in Europe and the United States: The Alzheimer Cohorts Consortium. Neurology, 95(5), e519-e531. https://doi.org/10.1212/WNL.0000000000010022

[28] In 2014, the lifetime prevalence of long-term care dependency in Germany was 56.7% (men) and 74.2% (women). Rothgang, H., Kalwitzki, T., Müller, R., Runte, R., & Unger, R. (2015). Barmer GEK Pflegereport 2015, Barmer GEK, p. 16.

[29] This was reported by the BBC (https://www.bbc.com/news/articles/cr70rvrd41ko): “Chinese President Xi Jinping and Russian President Vladimir Putin have been overheard discussing organ transplants as a means of prolonging life on the sidelines of a military parade in Beijing. Putin suggested even eternal life could be achievable as a result of innovations in biotechnology, according to a translation of remarks caught on a hot mic. The unguarded moment was captured on a livestream carried by Chinese state TV as the two leaders and North Korea's Kim Jong Un walked together through China's historic Tiananmen Square. Xi and Putin have been in power for 13 and 25 years respectively. Neither has expressed any intention of stepping down.”

[30] Today, the ultra-rich in Silicon Valley are searching for immortality and everlasting youth. In recent years, the quest for immortality has become the focus of biotech companies like Altos Labs, Retro Biosciences, and Calico Labs. Altos Labs, for instance, states its mission as restoring “cell health and resilience through cell rejuvenation [and reversing] disease, injury and the disabilities that can occur throughout life” (https://www.altoslabs.com). Calico Lap aims “to discover and develop interventions that enable people to lead longer and healthier lives” (https://www.calicolabs.com). These companies are backed by Silicon Valley entrepreneurs, including Jeff Bezos (founder and former CEO of Amazon), Larry Page (co-founder of Google), Peter Thiel (founder of Paypal), Sam Altman (CEO of Open AI), Yuri Milner and Sergey Brin . The concepts of immortality and everlasting youth are kicking and well even today.

[31] Madanamoothoo, A., & Schoch, P. (2024). The quest for the Benjamin Button effect in Silicon Valley: Bioethical and ecological issues posed by the longevity and immortality industry. Médecine & Droit, 2024(187), 73-76. https://doi.org/https://doi.org/10.1016/j.meddro.2024.05.001

[32] Inequalities go beyond social status. There are large differences in the chances for healthy and active ageing between societal groups, for instance in respect to gender, racial background or migration status. The gendered perspective on healthy ageing has been clearly depicted in the Cranach painting mentioned.

[33] Hank, K. (2011). How "successful" do older Europeans age? Findings from SHARE. The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences, 66B(2), 230-236. https://doi.org/10.1093/geronb/gbq089

[34] Social inequality influences the future life of a person early in life, already. Parental social status opens up or closes off educational opportunities. Employment careers for people with high educational qualifications are not attainable for people without these qualifications. Accumulation of opportunities (and minimisation of risks) over the life course directly lead into healthy and active ageing. Although it is not impossible to change course in later adulthood, the lifelong impact of social inequality clearly leads to uneven opportunities for healthy and active ageing. See Dannefer, D. (2020). Systemic and reflexive: Foundations of cumulative dis/advantage and life-course processes. The Journals of Gerontology: Series B, 75(6), 1249-1263. https://doi.org/10.1093/geronb/gby118

[35] Sabatini, S., Rupprecht, F., Kaspar, R., Klusmann, V., Kornadt, A., Nikitin, J., Schönstein, A., Stephan, Y., Wettstein, M., Wurm, S., & et al. (2025). Successful ageing and subjective

ageing: toward a framework to research a neglected connection. The Gerontologist, 65(1), gnae051. https://doi.org/10.1093/geront/gnae051

[36] Dewey, J. (1925). The development of American pragmatism. In: Philosophy and Civilization. Capricorn Books.

[37] Havighurst, R. J. (1963). Successful Aging. In R. H. Williams, C. Tibbits, & W. Donanue (Eds.), Processes of ageing: Social and psychological perspectives (pp. 299-320). Atherton Press

[38] Erikson, E. H., & Erikson, J. M. (1998). The life cycle completed. Norton. Ryff, C. D. (1989). Beyond Ponce de Leon and life satisfaction: New directions in quest of successful ageing. International Journal of Behavioral Development, 12(1), 35-55. https://doi.org/10.1177/016502548901200102

[39] Sen, A. (1993). Capability and well-being. In M. C. Nussbaum & A. Sen (Eds.), The quality of life (pp. 30-53). Clarendon.

[40] Gopinath, M. (2018). Thinking about later life: insights from the Capability Approach. Aging international, 43(2), 254-264. https://doi.org/10.1007/s12126-018-9323-0. Stephens, C. (2017). From success to capability for healthy ageing: Shifting the lens to include all older people. Critical Public Health, 27(4), 490-498. https://doi.org/10.1080/09581596.2016.1192583

[41] Baltes, M. M., Wahl, H.-W., & Reichert, M. (1991). Successful ageing in long-term care institutions. Annual Review of Gerontology and Geriatrics, 11, 311-337

[42] Schumacher, B., Antebi, A., Geiger, H., Krieg, T., Maier, A., Morrison, H., Niedernhofer, L., Niehrs, C., Scharffetter-Kochanek, K., & Scheibye-Knudsen, M. (2025). Health-Extending Medicine in an Aging Society: Perspectives of Medical Research and Practice. Leopoldina. https://doi.org/10.26164/leopoldina_03_01272.

[43] There is one exception, though: Aubrey de Grey's idea for a '1,000 year longevity Reich'. De Grey, a British computer scientist and theoretical biologist is an outsider to the established biology of ageing, but his hypotheses about extreme life expansion have been published in respectable journals and encyclopedias. De Grey, A. D., & Rae, M. J. (2022). Strategies for engineered negligible senescence. In Encyclopedia of gerontology and population ageing (pp. 4768-4773). Springer. https://doi.org/10.1159/000342197. "Fortunately, it seems that all ageing-related damage known to accumulate in the human body can be classified into just seven clearly defined categories" (p. 2): 1. Cell loss, 2. cell death resistance, 3. cell overproliferation, 4. intracellular 'junk', 5. extracellular 'junk', 6. tissue stiffening, 7. mitochondrial defects. – Other publications: de Grey, A. D., & Rae, M. (2021). Strategies for engineered negligible senescence. In D. Gu & M. E. Dupre (Eds.), Encyclopedia of gerontology and population ageing (pp. 4768-4772). Springer. – For a critique see Warner, H., Anderson, J., Austad, S., Bergamini, E., Bredesen, D., Butler, R., Carnes, B. A., Clark, B. F., Cristofalo, V., & Faulkner, J. (2005). Science fact and the SENS agenda: what can we reasonably expect from ageing research? EMBO reports, 6(11), 1006-1008.

De Grey proposes 'strategies for engineered negligible senescence' (SENS) which he believes could lead to extreme life-expectancies of up to 1,000 years. De Grey's societal visions refer to more flexible age structures, continuous education and employment over a very long time (or even centuries), equitable distribution of therapies, financing of health care, adjustment of pension models, and dealing with overpopulation and resources. -- De Grey, A. D. (2007). Life-span extension research and public debate: societal considerations. Studies in Ethics, Law, and Technology, 1(1). https://doi.org/10.2202/1941-6008.1011. See also Muller, F. (2007). On Futuristic Gerontology. A Philosophical Evaluation of Aubrey de Grey's SENS Project. International Journal of Applied Philosophy, 21(2), 225.

It should be noted that de Grey is an Advisory Board member of the German 'Partei für Verjüngungsforschung' (Party for Rejuvenation Research), a mono-thematic fringe party (see https://verjuengungsforschung.de/beirat-2, website accessed on 05 October 2025). – De Grey,

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A. D. (2007). Life-span extension research and public debate: societal considerations. Studies in Ethics, Law, and Technology, 1(1). https://doi.org/10.2202/1941-6008.1011. See also Muller, F. (2007). On Futuristic Gerontology. A Philosophical Evaluation of Aubrey de Grey's SENS Project. International Journal of Applied Philosophy, 21(2), 225. – It should be noted that de Grey is an Advisory Board member of the German 'Partei für Verjüngungsforschung' (Party for Rejuvenation Research), a mono-thematic fringe party (see https://verjuengungsforschung.de/beirat-2, website accessed on 05 October 2025).

Societies of extreme life-spans will lead to new and possibly unsurmountable difficulties, e.g. in terms of the employment cycle and retirement benfits. In addition, the construction of our own biographies would change profoundly. Just image, that you were born in 1,025 and lived through the late middle-ages, renaissance, enlightenment, industrialization up to today. Just one example: Thomas Hobbes described in his work 'Leviathan' the consequences of the most extreme life-span, the consequences of immortality: 'There shall be no generation, and consequently no marriage, no more than there is marriage or generation among the angels'. Thomas Hobbes (1651), Leviathan, Chapter 38: 'Of the Signification in Scripture of Eternal Life, Hell, Salvation, the World to Come, and Redemption'

[44] Social inequality: If we compare these eight narratives with a view to social inequality, it quickly becomes apparent that the models of healthy and active ageing, and also the hedonic and eudaimonic concepts ignore the problem of social inequality. In contrast, the capability-based approach explicitly and the care-based approach at least implicitly refer to the question of how disadvantages in old age can be mitigated in order to enable a good life until the end of life. These two approaches are also more inclusive when it comes to ageing well: it is not only the productivity and performance of old and very old people that is important, but also the conditions in which they live

[45] For a comprehensive discussion, see Tesch-Römer, C., Wahl, H.-W., Rattan, S. I., & Ayalon, L. (2022). Successful ageing: Ambition and ambivalence. Oxford University Press

[46] The Dutch law was passed in 2001; colloquially known as the 'euthanasiewet' ('euthanasia law'), its official name is 'wet toetsing levensbeëindiging op verzoek en hulp bij zelfdoding' (English: 'Act on the Review of Termination of Life on Request and Assistance in Suicide'). When the Act came into force, the Netherlands became the first country in the world to permit active euthanasia. Similar laws came into force shortly afterwards with the Act on Euthanasia in Belgium and the Act on Euthanasia and Assisted Suicide in Luxembourg. – In the Netherlands, active euthanasia is permitted under certain conditions. The Dutch law allows active euthanasia by a doctor if the patient is terminally ill, suffering unbearably and there are no reasonable alternatives. The patient must expressly state their wishes, act voluntarily and repeatedly, and at least two independent doctors or a palliative care specialist must agree. Doctors must ensure that the situation involves unavoidable suffering and that the patient has made an informed decision.

[47] Bundesministerium für Familie Senioren Frauen und Jugend (BMFSFJ) (Ed.). (2002). Vierter Bericht zur Lage der älteren Generation in der Bundesrepublik Deutschland: Risiken, Lebensqualität und Versorgung Hochaltriger - unter besonderer Berücksichtigung dementieller Erkrankungen. BMFSFJ (zugleich Bundestagsdrucksache 14/8822). Available in German, only. English title: Federal Ministry for Family Affairs, Senior Citizens, Women and Youth (BMFSFJ) (Ed.). (2002). Fourth report on the situation of the older generation in the Federal Republic of Germany: Risks, quality of life and care for the very elderly – with special consideration of dementia. BMFSFJ (also Bundestag printed paper 14/8822).

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