

The Pursuit of Longevity – The Bringer of Peace to the Middle East

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Abstract: Despite the common apprehensions regarding the aging population, this work aims to argue, on both deontological and utilitarian moral grounds, that any increase in general life-expectancy will be beneficial for the Middle East, countering the common fears associated with this increase. A set of ethical arguments concerning increasing longevity is presented, from both the deontological and utilitarian perspective. A wide selection of economic, psychological, demographic and epidemiological literature and databases is analyzed to determine common correlates of extended longevity. On the deontological grounds, the value of extended longevity is derived from the value of life preservation, regardless of its term. On the utilitarian grounds, the value of extended longevity is demonstrated by its correlation with further human values, such as education level and intellectual activity, economic prosperity, equality, solidarity and peacefulness. With the common apprehensions of stagnation and scarcity due to life extension found wanting, the pursuit of longevity by the population can be seen as a cross-cultural and cross-generational good. Though the current study mainly refers to sources and data relevant to the Middle East, a similar pro-longevity argument can be also made for other cultural contexts. In view of its numerous benefits, normatively, the goal of longevity should be set clearly and openly by the society, and actively pursued, or at least discussed, in academia, the political system and broader public.

Keywords: Deontological ethics, longevity, life extension, utilitarian ethics.

INTRODUCTION: LONGEVITY IN THE MIDDLE EAST

The nations of the Middle East are at the same time among the longest lived and the youngest in the world. The history of these nations dates back thousands of years, yet their current geopolitical constellation was mainly formed after WWII [1]. Though the ancestral heritage and experience of the age are honored throughout the Middle East, its population is relatively young, especially compared to the so called “Western World” or the “Developed World”. Youth dominates in virtually all the countries traditionally referred to as “Middle Eastern” or “Western Asian”.¹ Thus, the estimated fertility rate for 2005-2010 ranged from about 6 children born by a woman in Yemen and Afghanistan to 2 in Lebanon (3 for Western Asia generally), well above the European or North American rates of 1 or 2. The median age for Western Asia is about 25 years, while 42 for Western Europe (Fig. 1A). Yet, life expectancy in the region is also relatively lower than in the Western countries, ranging from 81 in Israel to 64 in Yemen and 47 in Afghanistan (about 71 for Western Asia generally). For comparison, Europeans are expected to live as long as 90 years in Monaco, 81-82 in

Switzerland and Iceland down to 68 in Ukraine (75 for Europe generally and over 80 for Western Europe) [2] (Fig. 1B). Hence, population aging may seem a more distant, less urgent problem for the Middle East than for the West, particularly for Europe. The youth of the Middle Eastern nations may make them more dynamic and enterprising, but at the same time more violent and less concerned with long term future.

Yet a gradual change in the demographic situation in the Middle East is under way. The fertility rate has been generally declining in the region, from about 6 in 1950 to about 3 in 2010 (Fig. 1C), while the median age climbed from 21 to 25 years. At the same time, the life expectancy is on the surge. While in 1950 people of the region were expected to live about 46-47 years, at the beginning of the century (2000-2010) the value rose to about 71-72. That is about a quarter of a century increase in life years, during the past half a century (Fig. 1D). In other words, every year about 6 months of life expectancy are added for the population of the region. It is one of the fastest rises in the world and there is yet no foreseeable ceiling or bottle neck for this uprising.

The proportion of the aged population grows correspondingly. Thus the section of people above 65 has increased from about 4% in 1950 to about 5% in 2010, and is projected to increase to 10 up to 15% by the middle of this century (Fig. 1E). The increase of the aging population is not as dramatic as in Western Europe, where the corresponding values rose from 10 to about 18% and are expected to further increase to 28-30% by the middle of the century [2]. For the Middle East, the increase of the aging population is not as salient, but nonetheless evident.

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¹The present study uses the UN Population Division categorization for Western Asia, including: Armenia, Azerbaijan, Bahrain, Cyprus, Georgia, Iraq, Israel, Jordan, Kuwait, Lebanon, Occupied Palestinian Territory, Qatar, Syrian Arab Republic, Turkey, United Arab Emirates, and Yemen, with the addition of Iran, Egypt and Afghanistan. (*United Nations, Department of Economic and Social Affairs, Population Division. (2011). World Population Prospects: The 2010 Revision, CD-ROM Edition. Retrieved from <http://esa.un.org/wpp/>.*)

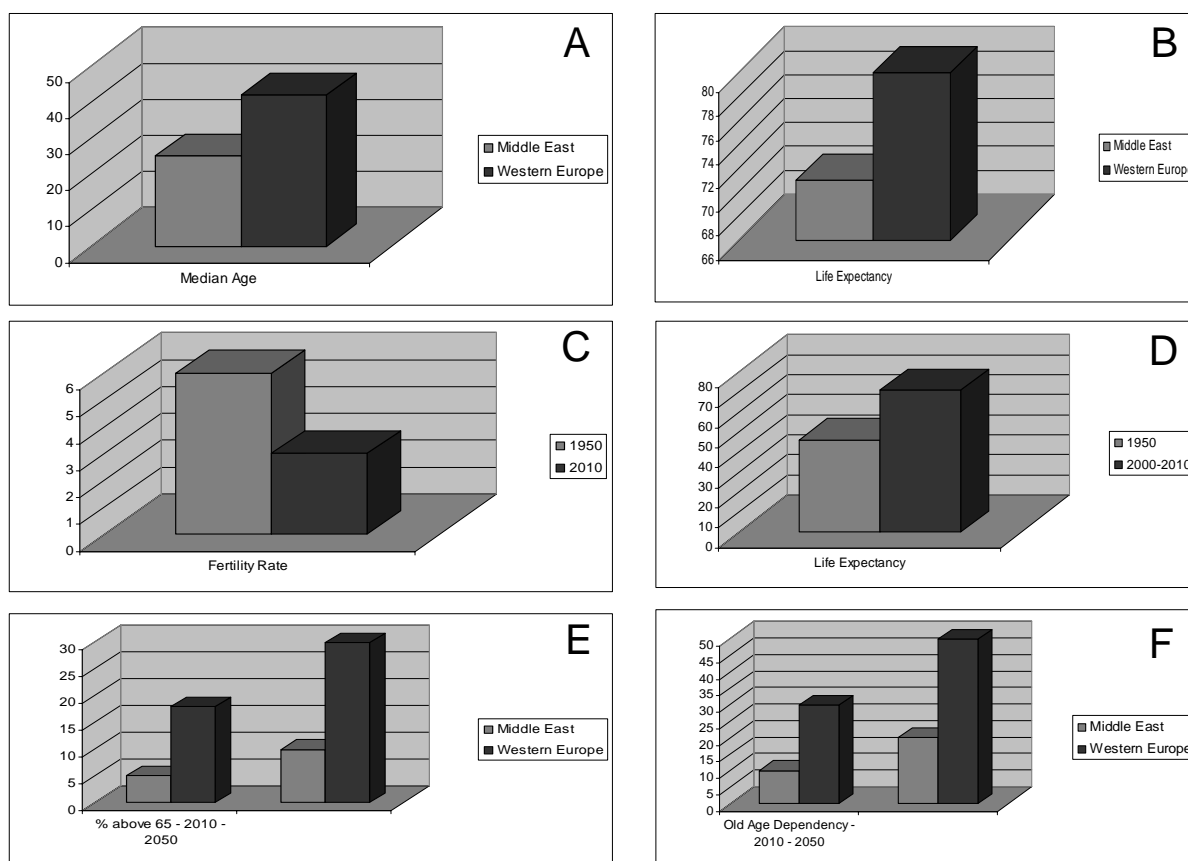


Fig. (1). The Middle East is young but growing up. **A.** Median Age in 2010 in the Middle East (light grey) vs. Western Europe (dark grey). **B.** Life Expectancy in 2010 in the Middle East (light grey) vs. Western Europe (dark grey). **C.** Fertility Rate in the Middle East in 1950 (light grey) vs. 2010 (dark grey). **D.** Life Expectancy in the Middle East in 1950 (light grey) vs. 2010 (dark grey). **E.** % above 65 years old in 2010 (left) vs. est. 2050 (right) in the Middle East (light grey) vs. Western Europe (dark grey). **F.** Old Age Dependency – % above 65 years old to working age in 2010 (left) vs. est. 2050 (right) for the Middle East (light grey) vs. Western Europe (dark grey).

Notably, during the past 60 years, the proportion of people above 65 to those of working age between 20 and 64 (the “old age dependency ratio”) has not changed substantially in the Middle Eastern region, remaining at about 10%. This may permit a better sustainability for the aged than in Europe, where the old age dependency rose dramatically from 17 to about 30% during this period, and is expected to exceed 50% by the middle of the century, and in some areas even 60% by the end of the century (Fig. 1F). Despite the general stability of the old age dependency ratio, in some Middle Eastern countries the change is more prominent (from 7 to 19% in Israel, and from 5 to 10% in Turkey, during the period 1950-2010). In any case, the old age dependency for the region is expected to climb to over 20% by the middle of the century, and as high as 50% by the end of the century [2] (Fig. 1F). The prospect may appear threatening for the economy, unless the very definition of the “old age dependency” changes, as more people of higher age will remain productive. A more general question may arise, whether the evident population aging of the region is indeed threatening.

THE PURSUIT OF LONGEVITY AS AN EXPRESSION OF LIFE VALUATION AND DEONTOLOGICAL DUTY

Despite the common apprehensions regarding the aging population, I would argue, on both deontological and utilitarian

moral grounds, that any increase in general life-expectancy will be a blessing for the region, and it will be a double blessing if healthy and productive life expectancy increases. The argument will derive from both the absolute and utilitarian valuation of human life.

The connection between valuation of life and prolongation of life has been postulated earlier. As stated by the British philosopher Herbert Spencer (1879), the prolongation of life in and of itself is a social good, insofar as life is good:

By those who think life is not a benefit but a misfortune, conduct which prolongs it is to be blamed rather than praised ... Those who, on the other hand, take an optimistic view, ... are committed to opposite estimates; and must regard as conduct to be approved that which fosters life in self and others, and as conduct to be disapproved that which injures or endangers life in self or others.... Legislation conducive to increased *longevity* would, on the pessimistic view, remain blameable; while it would be praiseworthy on the optimistic view [3].

Thus there is an almost self-evident, yet seldom explicitly stated, moral imperative to prolong life, insofar as life is held to be of value.

This imperative was realized by many great thinkers of the Middle East, from ancient to modern times. In the little-

known work by the Egyptian Jewish philosopher and physician Maimonides (1135-1204, Rabbi Mosheh ben Maimon, or Mūsā ibn Maymūn in the Arabic pronunciation) – “The Responsum on Longevity” – the desirability of life prolongation is derived from the valuation of human life, and the possibility of life prolongation is derived from the valuation of human effort (reproduced in full in Rosner, 1998). Maimonides stated this imperative unambiguously:

It is written: ‘When you build a new house, you should make a parapet for your roof so that you bring not bloodshed upon your house should any man fall therefrom’ [Deut. 22:8]. This phrase proves that preparing oneself, and adopting precautionary measures – in that one is careful before undertaking dangerous enterprises – can prevent their occurrence.

This demonstrates, however, that there is no firmly determined time for death. Moreover, the elimination of harmful things is efficacious in prolonging life, whereas the undertaking of dangerous things is the basis for shortening life [4].

The same positive, even proactive, attitude to extending longevity was affirmed by Islamic scholars. Thus the Arab physician Abu Mūsā Jābir ibn Hayyān (also known as Jabir in Arabic and Geber in Latin, c. 721-815) whose theory of elements profoundly influenced both the Islamic and European (Latin-Christian) alchemy, theorized: “If you could take a man, dissect him in such a way as to balance his natures [qualities] and then restore him to life, he would no longer be subject to death” (quoted in [5]). Later on, the Persian scientist and philosopher Khwajah Nasir al Deen Tusi (1201-1274) said: “Extended life spans have occurred for other than al-Mahdi (P.B.U.H.) and been recorded, and for this very reason it is pure ignorance to consider his longevity as improbable.” Also in more recent time, the Azerbaijan-Iranian philosopher and theologian Allamah Tabataba’i (1904-1981) stated: “There are no intellectual reasons or rules to denote the impossibility of an extended life span; therefore, we cannot deny it” (quoted in [6]).

The supreme value of human life and the need to prolong it by all means possible were recognized by non-religious thinkers of the region as well. Thus in the words of the Iranian futurist philosopher and one of the founders of the transhumanist intellectual movement Fereidoun M. Esfandiary (1977), “We must rebel against the vulnerability of the human body. ... Life is now too precious ... More than ever therefore it is urgent to overcome death” [7].

Thus the search for the prolongation of human life, deriving from the very value of life and the duty to preserve it, has transcended religious, national and even temporal boundaries. It has been a common unifying pursuit of humanity, for people of the Middle Eastern region in particular.

THE PURSUIT OF LONGEVITY AS A UTILITARIAN AND PRAGMATIC VALUE

Beside the overarching ethical imperative, there may be more utilitarian and pragmatic reasons to endeavor to prolong the general life expectancy in the region. The main reason is that high longevity has been correlated with virtually

all positive components of human development. In fact, the Human Development Index includes life expectancy – alongside the education level (years of schooling) and standard of living (gross national income per capita) – as a definitive component of human development. Moreover, there is a strong correlation between these components. When advancing one of them, another is almost necessarily advanced.

Thus longevity strongly correlates with the education level and intellectual activity, as was shown in a variety of studies [8-11]. The relation is reciprocal. High intellectual activity fosters brain vitality, interconnectedness and plasticity for the long term. Good education advances the science of longevity, as well as expands health choices. In turn, longevity allows for the accumulation of knowledge and experience.

Longevity has also been correlated with economic prosperity, both individual and national [12, 13]. As suggested by the Nobel Prize winning economist Amartya Sen (1998), mortality (equivalently presentable as life expectancy) can serve as a universal “indicator of economic success and failure” [14]. The reasons for this correlation seem clear. For the individual, wealth protects against life threatening hardships and permits a better health care. The well known link between the level of education and income further synergistically improves longevity [11]. On the national level, wealth is needed to ensure funding for longevity research and public health programs. And conversely, longevity may ensure high individual and national saving power, sustainability and stability.

Not just the general amount of wealth, but the way wealth is distributed is strongly coupled to longevity. Equality strongly correlates with longevity [15, 16]! Indeed in an egalitarian society, health care resources are distributed more equitably, producing a general rather than a sectoral increase in life expectancy. Thus, crucially, improving longevity may be seen as a powerful means to peacefully oppose inequality, both within and between societies.

Longevity is almost inexorably associated with peacefulness, insofar as life preservation is by its very nature antagonistic to the pursuit of war (unless self defense is involved). Furthermore, people of higher age have been consistently found to be less violent, vengeful and reckless [17, 18]. The pursuit of longevity is pacifist almost by definition, insofar as the very survival to a higher age involves lower risk taking, greater prudence and empathy, as well as long term planning – the qualities necessary for successful peace negotiations.

Thus the pursuit of longevity would involve the achievement of many (perhaps the majority of) pragmatic utilities that people value. Furthermore, the striving to achieve longevity may become a unifying and uplifting pursuit in many areas of development, for humanity generally and for the Middle East in particular.

COMMON OBJECTIONS TO INCREASING LONGEVITY COUNTERED

Several poignant questions arise. Would the pursuit of longevity be necessarily unifying and uplifting? Would not

the aging of the population bring stagnation to the region? Would not the corresponding decline in fertility portend the peace of death? Or, on the contrary, would not the increasing life expectancy produce an insupportable and disruptive growth of population? In other words, would not the general attainment of longevity lead to a general shortage of resources in the region? Would longevity be indeed universally shared, or would life-extending technology become yet another means of ethnic, religious and economic segregation and discrimination? These are grave concerns. Yet, I would argue that such disastrous occurrences are rather unlikely consequences of generally increasing life years. Indeed positive outcomes may rather be expected.

The common ethical arguments against extended longevity have been discussed earlier and can be schematized [19-21]. One of the major moral arguments commonly raised against this possibility is that extended (unrestricted) longevity would abolish or diminish change. A dystopian society is often envisioned, ruled by immutable gerontocracy, whose citizens are irrevocably fixed in the old ways of thought and deed. The constancy of habit, it has been often implied, may involve prolonged suffering, or being captured in an undesirable state. The stasis may be alternatively interpreted as spiritual and mental stagnation, boredom, lack of progress, absence of meaning and of achievement. Variations on these themes are present in great many contemporary works of fiction and philosophy relating to longevity or even those considering extreme longevity to emphasize their points of argument [22-24].

Despite the often elaborate objections, the ethical desirability of healthy life-span extension is almost self-evident to persons, who, in Hebert Spencer's terms, adhere to the "optimistic view" which holds life to be "a benefit". In such a view, death is not a solution against either stagnation or suffering. In such a view, the element of constancy inherent in any stable living system is a necessary and positive phenomenon. Yet, with extended longevity, the potential for positive change, for learning and development, may also be increased. Such a prolonged cultural adaptation may be sufficient and necessary for the survival of the society, rather than causing its stagnation and demise. Regarding the undesirable prolongation of suffering, in the "optimistic view," suffering is not considered inevitable, insofar as human beings are believed to be able to actively influence their fate and relieve suffering. Regarding boredom and loss of meaning, the "optimistic view" would maintain that life may carry a meaning of its own, independent of death, that it is hard to place a temporal limit on the love and enjoyment of life, and that human individuals are entitled to choose a prolonged existence.

It has been often argued that, even though extended longevity may be beneficial for the individual, it may be disastrous for the society, as it would produce a general shortage of resources that are supposed to be drained by the elderly. This hypothetical development has been often termed "overpopulation" and was proposed by Malthus' theory (1798) [25]. The argument from overpopulation may be countered on moral grounds by acknowledging that rationally controlled development and care for the survival of every individual, the elderly and weak in particular, even at some loss

of resources, may be more advantageous for the development and maintenance of society than blind Darwinian selection.

Yet, the argument from overpopulation may also be countered on historical and empirical grounds. From the empirical perspective, considering the current demographic and technological trends, the shortage of resources due to extended longevity can hardly be expected, especially for the Middle East/Western Asia.

The population density in the region is not high – about 50 people per square kilometer, compared to about 170 in Western Europe [2]. Yet population density in itself can not be considered a measure of overpopulation. Only lack of resources, especially food resources, to support the population can serve as such a measure. In this regard, there are good grounds for optimism, based on the current trends of technological development, especially for agricultural technology. As early as 1963 the Agricultural Economics Research Institute of Oxford calculated that the agricultural productivity available at that time would suffice to feed at least 45 billion people (about 550 people per square kilometer or over 700 if all the food would come exclusively from nutritious crops). This estimate assumes that the minimal food requirement is about 500 kilograms dry weight per person per year, and that over half of the world dry land (~82 million square kilometers) is available for agriculture [26].

Since that time, the agricultural productivity increased dramatically, far in advance of population growth [27]. Thus, in 1961, the yield of wheat in the UK, the birthplace of Malthus, was 3,500 kilograms dry weight grain per hectare; by 2000 it increased to 8000 kg (128% increase), compared to 15% increase in population (from 52 million to 60 million) and 10% increase in life expectancy (from 70.85 to 78.04 years) [28, 29] (Fig. 2A). Yet, in fact, presently the highest cereal yield in the world has been achieved in the Middle East, the world's cradle of agriculture. Thus, as of 2011, the greatest cereal yields of over 10,200 kg per hectare were reached in Oman, and over 8700 kg per hectare in Kuwait [30] (Fig. 2B). The area of the Middle East is over 6 million square kilometers (comprising the UN Western Asia region, plus Iran, Egypt and Afghanistan). Even excluding about 70% of the arid land of the region (the exclusion is not necessary, as aridity can be overcome by such techniques as desalination and dripping irrigation), that is, only allowing 1 to 2 million square kilometers for agriculture – with Oman's productivity, that area could feed from 2 to 4 billion people. With the current region population of over 410 million people, even with the present population growth rate of ~2.4% (though it is clearly on the decline), "overpopulation," either in terms of territory or food supply, is hardly in sight, whatever the rise in life expectancy [2]. The present, relatively high population growth rate, despite its expected decline in the foreseeable future, also deflates the opposite fear of the region's depopulation due to the aging society.

Shortage in other necessities also should not be expected or feared under proper technological management, as the growth rate of the general domestic product per capita (general productivity) commonly exceeds the growth rate of agricultural productivity. Using the UK as an example, from 1960 to 2000, its GDP per capita (at purchaser's prices in constant 2000 U.S. dollars) increased by ~130% (from

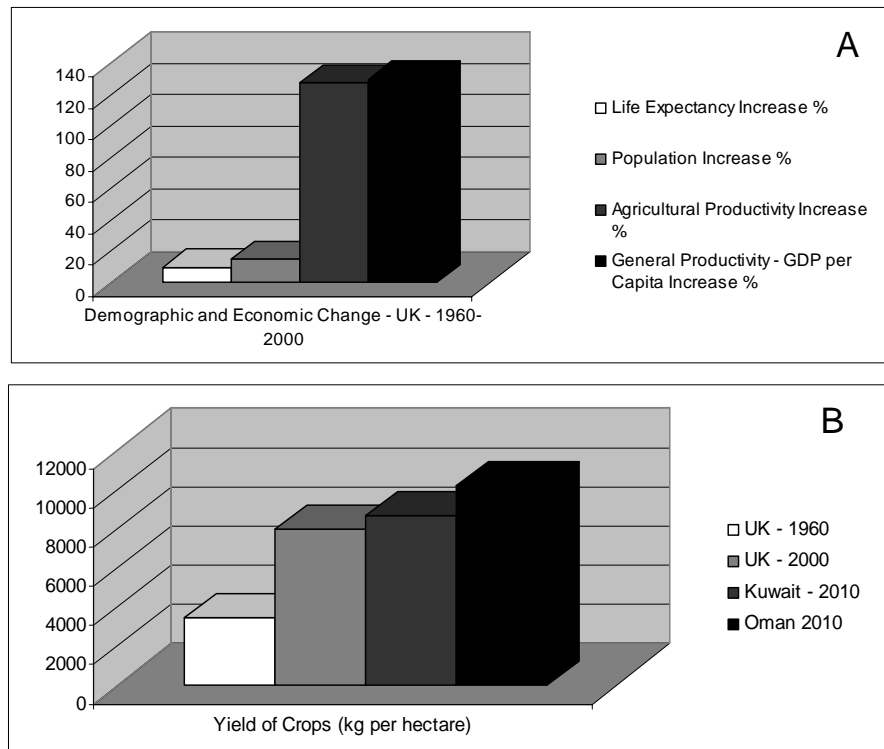


Fig. (2). Will Malthus continue to be wrong? **A.** The demographic and economic change in the UK, from 1960 to 2000. Left to right: Life expectancy increase %, Population increase %, Agricultural productivity increase %, General productivity – GDP per Capita increase %. **B.** Yield of crops kg per hectare (left to right): UK – 1960, UK – 2000, Kuwait – 2010, Oman – 2010.

\$10,500 to \$24,150) [31]. A similar trend toward general and agricultural productivity overcoming the population growth can be observed for many other countries, with such diverse economic capabilities and population densities as the US, Kuwait, Turkey, Israel, Afghanistan, and more [30]. Thus, with the proper and equitable use of available technology, in particular agricultural technology, fears of resource shortages that may be attributed to increases in life expectancy are generally unfounded.

ABSOLUTE AND RELATIVE BENEFITS OF EXTENDED LONGEVITY

Thus, not only on deontological grounds, but also on utilitarian and pragmatic moral grounds, any increase in life expectancy can be seen as absolutely and generally beneficial. Not only does the increasing longevity embody life valuation and preservation, but it is also highly conducive to a broad set of further human values: advanced learning and development of science, improving the national and individual standard of living, as well as equality and justice in society, interpersonal and intergenerational empathic and sympathetic attitudes, peacefulness alongside defense and sustainability. In summary, longevity can be seen as a quantifiable teleological cause for a general economic and humanitarian amelioration. With the common apprehensions of stagnation and scarcity due to life extension found wanting, the pursuit of longevity by the population can be seen as a cross-cultural and cross-generational good. Dares one say an absolute good?

Apparently not. Even though the net absolute effects of extended longevity may be positive, its relative benefits for

different people may remain a point of concern. In other words, even though life quantity can be seen as an absolute value, life quality – understood as the level of functionality and adaptation, freedom of choice and capabilities – may remain relativized and unequal between different persons, different segments of society, different nations, as well as between the young and the aged. A greater parity in terms of the quality of life may be desired. For example, the beneficial qualities of old age, such as experience, prudence, long term and holistic vision, may be inculcated in a greater measure to the young. Conversely, the qualities of youth, such as immediate high performance, passion, physical and mental stamina, can be in a greater measure imparted to the aged. Such an exchange can become a central objective of intergenerational solidarity and strengthening of family ties, or even of the general social solidarity. The granting of the benefits of youth to the old age, and conversely allowing the old age to share its gains with the young can become a means for increasing the involvement and productivity of the aged in society, not as a mere “work force” but as a “creative” and “formative” force. The overarching goal may be formulated as “living long while remaining young, and being young while planning to live long.”

Even the net increases of longevity, thanks to access to life-extending technologies and means of support, may remain relativized and unequal. Hence, a greater parity in longevity gains and universal access to life-extending technologies may also remain strategic goals. In this sense, the pursuit of longevity would involve the pursuit of solidarity, common productivity, sharing and equal rights within and between societies.

THE PURSUIT OF LONGEVITY AS A COMMON GOAL

In view of its numerous benefits, normatively, the goal of longevity should be set clearly and openly by the society, and actively pursued, or at least discussed, in academia, the political system and broader public. The suggestion may appear trivial, unless recalling the frequently observed “veil of silence” over this issue. A program for the pursuit of longevity is yet to be formulated for the Middle East. Yet some of its features may be envisioned. The pursuit of longevity would strengthen the support of geriatrics and gerontechnologies, maximally facilitating the life of people of older age. This pursuit would advocate preventive medicine, as well as techniques for improving cognitive and psychological function. Environmental technologies and technologies for improving the conditions of daily life would be deployed, including means of access and convenience for the elderly. Social, educational and occupational frameworks would be created and/or expanded, involving the aged and encouraging their integration with the entire population. Such means would improve the quality of life of the aged from the “outside”.

Yet, in addition, the pursuit of longevity would necessarily involve the performance or at least a discussion of an extensive program of fundamental and applied biomedical studies, dedicated to the maximal possible control over the deteriorative aging process from the “inside”. Granted that the deteriorative aging process lies at the root of chronic age-related diseases, the pursuit of longevity *via* maximal feasible amelioration of this process would also mean the pursuit of health and quality of life [32, 33].

Insofar as aging is an extremely complex multi-factorial process, which can be addressed or even approached by no single ‘magic bullet’ treatment, the pursuit of longevity must necessarily be multi-disciplinary and involve many sub-projects, all of which would reinforce each other by cross-fertilization [34]. The subprojects may include: the development of geriatric pharmacology, technologies for regenerative and rejuvenative medicine, including research and testing of potential geroprotective therapeutics, such as telomerase activators, as well as potential activators of sirtuins and several other putative “longevity genes”, other forms of “gene therapy” and RNA interference therapy; cell cycle regulation (inducers of cell death and cell regeneration); stem cells and their products; modulators of mitochondrial energetics, and an additional wide variety of dietary substances; establishing optimal and individualized regimens of nutrition and physical activity; interventions for the elimination of major types of age-related damage (by immuno-clearance, enzymatic catalysis, oxidoreductive depolymerization, etc.). The pursuit of longevity would involve a combination of other potential methods and fields directed against the structural impairment associated with the aging process, such as nanotechnology and nanomedicine, investigating the use of nano-particles as therapeutic agents and the potential uses of nano-devices for tissue repair; cryo-preservation and chemo-preservation; advanced methods of man-machine interaction; the use of biological data mining to discover effective life-extending interventions [35].

Enhanced research in these areas could mean a surge of scientific, technological and economic development and co-operation in the Middle East. Generally, the explicit and widely supported pursuit of longevity, beside its definitive value for life preservation, could bring to the region the associated benefits of better education, productivity, solidarity and peace. Though the current study mainly refers to sources and data relevant to the Middle East, a similar pro-longevity argument can be also made for other cultural contexts.

CONFLICT OF INTEREST

The author confirms that this article content has no conflict of interest.

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