



Policy Paper on Healthy Ageing – BFHA2020 Conference

Authors: Mirjana Kujundžić Tiljak, Marijan Klarica, Željko Reiner, Ana Borovečki, George Vradenburg, Branimir Anić, Zoran Đogaš, Dinko Mitrečić, Irena Martinović Klarić, Dagmar Radin, Ilaria Bellantuono, Monica DiLuca, Dan Ehninger, Miloš Judaš, Agnieszka Olszewska Guizzo, John E. Vena, Julia Wadoux, David Mendes, Gerda Neyer, Venet Osmani, Boris Brkljačić, Davor Ježek, Ratko Magjarević, Stjepan Orešković, Zdravka Poljaković, Tomislav Rukavina, Sven Seiwerth, Josep Figueras, John Middleton

Introduction

Populations around the world are ageing faster than ever in the past. A constant and already impressive rate in the worldwide increase of life expectancy has led to the fact that the current proportion of the population above 60 years (17%) will double in the next thirty to forty years. In the next 30 years, every third person in the world will fall into the category of a senior citizen. This demographic transition will have an impact on almost all aspects of society and requires a complete and well-defined shift in the paradigm in the medical, social, and technological fields.

Croatia's Presidency of the Council of the European Union 2020 highlighted demographic challenges and ageing as important issues. Under the Horizon 2020 Work Programme Health, demographic change and wellbeing 2018–2020 call 10 within the section "Other actions", a conference **Better Future of Healthy Ageing 2020 (BFHA 2020)** took place as a part of "Croatian Presidency event – Innovation for better ageing", organized by the University of Zagreb School of Medicine at the Andrija Štampar School of Public Health.

The conference addressed growing demand caused by global trends of population ageing and the expansion of chronic disease by focusing on potentials large-scale implementation of innovations to foster functional ability and wellbeing of older people. The objectives of the conference were:

1. to address issues of ageing of biological systems through the topics of regenerative medicine, neuroscience, clinical medicine, and other fields of medicine with the emphasis on personalized and integrated medicine;
2. to showcase the impact of smart technologies for age friendly ecosystems by providing a discussion on scaling up innovations and solutions for age-friendly environments;
3. to analyse the issues of ageing and healthcare system sustainability at various levels (e.g. institutional, regional, state, EU level).

Based on the three objectives the conference **Better Future of Healthy Ageing 2020 (BFHA 2020)** was divided into three main themes:

- **Ageing of Biological Systems**
- **Smart Technologies for Age Friendly Ecosystems**
- **Ageing and Health System Sustainability**

This paper is a result of the conference discussions. This paper aims to present the current state of the art in the three themes discussed during the conference and to raise questions important for future discussion within the EU concerning healthy ageing. It will also set out specific goals within each of the three teams and mechanisms for possible actions their monitoring to promote accountability in future discussions within the EU.

Ageing of Biological Systems

Ageing, although highly individual and not easily comparable among subjects and societies, is a major risk factor for age-related conditions and is causal to many age-related diseases including COPD, cardiovascular disease, neoplasms, osteoporosis, rheumatoid arthritis, cataract and Alzheimer's disease.

There is good evidence, shown in animal models and recent clinical studies in humans, that ageing is a risk factor and decelerating ageing has the potential to decrease risks of developing the disease. These approaches include maintaining body composition (reducing obesity), good nutrition (less meat, more fruits and vegetables, e.g. Mediterranean diet), more exercise, healthy sleep habits, moderate alcohol consumption (glass of red wine taken with a meal), intake of probiotics.

From the biological point of view, it is challenging to link age-related diseases to general principles of ageing, which means that discovering approaches to decrease the rate of protein damage could have beneficial effects on all age-related diseases including COPD, cardiovascular disease, neoplasms, osteoporosis, rheumatoid arthritis, cataract and Alzheimer's disease.

Ageing can be accelerated or decelerated by interfering at the cellular level with several mechanisms driving ageing including the accumulation of excessive DNA damage or misfolded protein or cells which have aged and are no longer functional but release inflam-

matory factors which are detrimental to the organisms (senescent cells). By decelerating ageing, it is possible to reduce the risks of developing age-related diseases and improve health span.

European Brain Council estimates that in Europe the total cost of brain diseases on a yearly basis amounts to around 798 billion euro; for dementia only, the cost is 22.000 euro per patient, per year. Considering the costs of dementia for the European society and that these costs will increase considerably in the coming years due to the ageing of the European population, one way of curbing this increase and eventually decreasing the costs is via intensified research. Only by improving the insight into the basic functioning of the brain and translating this knowledge to the disease state, understanding the causes of the disease process and paving the way for better targeted and improved treatment can the upwards spiral of the costs of brain disorders be stopped.

Particularly there is the need to emphasize the importance of raising awareness and encouraging education on the brain and the repercussions of neurological and mental health conditions on society as a whole considering that the vast majority of brain disorders are strongly influenced by an ageing population, where an increase in healthy ageing is desired.

Ischemic heart disease (IHD) is a major cause of morbidity and mortality among older persons, as the age represents the strongest risk factor for the development of the atherosclerotic changes along the arterial tree. Older patients often have an atypical clinical presentation and more complications. Stated facts leave for the task on future trials to involve more elderly in their investigations, therefore pathophysiology, presentation and treatment can be better understood.

Rheumatic diseases are a prevalent group of entities with a significant impact on the quality of life and morbidity in older persons. Adequate timing of contemporary treatment that is available can lead to prevention of disability; decline in sick leave, prolongation of time actively spent at work, as well as increased survival.

Neoplastic diseases are, having some exceptions in the field of hemato- and neuropathology, by far more common in older people. The theoretical basis of this is wide, not always well defined by clearly including the passing of time as one of the key factors. Sophisticated technologies are today opening widely the field of multigene testing, meanwhile also opening the question of rationalizing diagnostic efforts.

Sleep is the state at which we spend around one-third of our life. It is not the only duration of sleep that is linked to increased morbidity and mortality like in chronic sleep deprivation and insomnia but also sleep quality which is reduced in many sleep disorders. Cer-

tain sleep disorders are strongly associated with age and so prevalent in older populations being present in 50% or more people. They are also strongly associated with the most prevalent diseases of today such as dementia, cardiovascular diseases, and hypertension, as well as diabetes. Intermittent hypoxia during sleep in Obstructive Sleep Apnea (OSA) patients is a major concern in sleep medicine of today and it is highly prevalent but treatable sleep breathing disorder whose treatment is one of the strongest possible prevention measures which may help in securing healthy ageing by preventing some of the major causes of death in this age, such as stroke, myocardial infarction, arrhythmias, diabetes, etc.

Ageing is a risk factor for frailty, a common clinical syndrome in older adults, defined as an accumulation of deficits and loss of resilience to adverse events and increased risk for poor health outcomes including incident disability, higher hospitalization, and mortality rate. There is evidence that by targeting mechanisms such as senescence it prevents or reduces frailty and improves the ability to overcome adverse events such as fractures and infections.

Policies that will support the testing in clinical trials with a new class of drugs and integrate their use with existing public health interventions are required. There are many issues with establishing clinical testing for drugs targeting ageing in older patients with multiple chronic conditions. This group of people is often excluded or under-represented in drug testing trials. Due to the lack of knowledge and a clear route to market pharmaceutical companies do not invest in the testing of these drugs and therefore governmental funding is required to risk their investments and open a new market which will bring both better health and great economic benefit and competitiveness in Europe.

The time and cost of current clinical trials in humans delay the delivery of innovative medicines to those in need. The EU, working with national governments, has an opportunity to reduce the time and cost of European and global trials by encouraging Euro-wide mechanisms for ethical reviews of drug protocols, by innovating digital means of recruiting and testing trial participants and by linking European trial support mechanisms with those in other regions of the world (e.g., the European Prevention of Alzheimer's Dementia partnership with the North American Global Alzheimer's Platform).

It is important not only to focus on an already aged population but also on those who will inevitably enter this stage. Ageing is a continuous process starting in utero, and interventions should be focused across the life course. There is a clear need for the medicine of the 21st century to focus not only on persons with existing problems but also to shift its focus to presently healthy

individuals who are soon entering the senior category. Similarly to focus on preventing certain diseases by applying standards of health promotion such as a healthy diet and exercise, we need to become aware of the need for programmes that will move us into pursuing the goal of healthy ageing in all its elements. These should include prevention of injuries, an individual approach to cognitive and mental health, prevention of chronic diseases, and general social engagement.

It is possible to decelerate ageing with public health interventions such as exercise and a healthy diet but also with the development of new drugs which have the potential to prevent multiple age-related conditions and improve the resilience of the older population. COVID-19 pandemic is an excellent example of how interventions improving resilience may protect older people from death.

Furthermore, there is a constant need for strengthening the information flow and accelerating the exchange of experience on the on-going and future projects as well as maintaining continuous dialogue between all the stakeholder groups at the national and European level and initiatives to allow that objectives are aligned, and needs are met.

Smart Technologies for Age Friendly Ecosystems

Modern Information and Communication Technologies (ICTs) can play a key part in helping older people to lead more independent and healthy lives and to improve social participation. Age-friendly technologies and ecosystems allow older people to live independently, monitor their health, create and maintain social networks, stay in contact with friends and family, have access to goods and services, and engage in work or voluntary activities. Smart ICT solutions and advanced artificial intelligence (AI) implemented in homes, communities, and cities can be used to provide personalized healthcare and social services, solutions to overcome lack of mobility, cognitive and visual problems. They also can improve the general quality of life by providing interactions with family, friends as well as health care and social care providers through telehealth. Digital technologies can encourage all groups of patients, and older persons, to take a more active role in their health management.

Regarding the scientific approach to ageing research, we must improve measurement, monitoring, and understanding of that field. Focused research, new metrics, and analytical methods are needed for a wide range of ageing issues. This work builds on the extensive work WHO has done in improving health statistics and information, for example through the WHO Study on global ageing and adult health (SAGE). The examples of proven and good practices of using ad-

vanced technologies to increase the functionality and well-being of ageing citizens will contribute to a deeper understanding of how to adopt and implement these proven good practices in various European and International contexts.

Smart technologies and the data collection related to the use of these tools could be a powerful research engine for age-related conditions and to advance healthy ageing. Consider Alzheimer's disease as an example. Increasingly, the research community is developing evidence that indicates that cognitive and motor changes may occur before symptoms. Smart technology and digital tools may be best suited to detect cognitive decline in the earliest stages of the disease. To advance the opportunity, there should be broad collaboration in the identification of readily accessible digital biomarkers to advance digital phenotyping with a plan to develop, test and implement new technologies. One possible centre for collaboration could be with the Davos Alzheimer's Collaborative, being led by The Global CEO Initiative on Alzheimer's Disease and The World Economic Forum. The development of digital phenotyping for Alzheimer's would also support other areas of research focusing on ageing.

Addressing the issues of tracing and assessing the use and impact of advanced technologies for the functionality and well-being of ageing citizens to the benefit of transformative and mission-oriented research and innovation agenda, is going beyond the traditional focus on the scientific impact of research. On the contrary, it emphasizes societal impacts, structuring impacts on policymaking and policies as well as impacts on innovation and economy.

Ageing and Health System Sustainability

Equally complex as biological ageing is defining and promoting actions towards filling societal needs caused by ageing processes. Apart from the need to bridge biomedicine and social sciences, it is important to focus on a macro, mezzo, and micro level scope when investigating ageing phenomena.

By thinking strategically, we must clearly distinguish a) strategies aimed at the individual level to slow down ageing in the biological system and b) strategies aimed at the population level to define and pursue societal initiatives and policy changes to establish clear and effective approaches to address the public health impacts of an ageing society.

Today, we are facing healthcare challenges as the result of the rising and potentially unsustainable health and care costs, due to the increasing prevalence of chronic non-communicable diseases, to an ageing population requiring more diversified care and to increasing societal demands.

Most health services and health systems are well designed to cure acute conditions or symptoms and tend to manage health issues in disconnected and fragmented ways. Lack of coordination across care providers and health services settings as well as not optimal time-management could be especially dangerous for organizing optimal care for older persons. Health systems need to be transformed so that they can ensure affordable access to evidence-based medical interventions and timely organized shared care to address older people with specific needs according to their social determinants of health.

Health care and social care should be connected. The single disease model of care should be replaced by a more holistic approach where older people with multiple conditions are managed by a team of specialists and where the geriatricians are at the centre of delivering care, involved in much earlier stage. It is the only way by which health care can prevent further health deterioration, disability and prevent complicated care dependency later in life.

We recognize an urgent need to define clear goals, both for caretakers and caregivers. What are the expected outcomes? For a person impaired by joint pain, healthy ageing should focus on “active ageing”, while for a socially isolated person, it should include an element of community and social involvement. A retired person who is feeling superfluous should be able to attend a supportive programme to facilitate the transition from work to retirement, and one who is diagnosed with dementia should get adequate and quality support to better manage with this specific condition.

We often ask ourselves the following questions: Are we attempting only to promote longevity without an increase in the quality of life? Or are we also concerned with reducing costs linked to ageing? What are the final goals and measures that will tell us whether the users of our healthy ageing programs are successfully treated? However, there is no healthy longevity without an increase in quality of life on all stages.

Considering this idea, our health systems will need to become more aligned with the needs of an older population with the introduction of special programs to prevent the onset of diseases. The focus of the health service provision needs to shift from treating illness in clinical settings to preventing it by integrating care to include health promotion activities, and by including the often-overlooked mental health services, as well as non-clinical and non-pharmacological interventions, such as community and social services, as well as self-care practices. This would bring us closer to achieving a healthier population with an improved quality of life, which is one of the fundamental goals of a health care system.

We recognize a need for coordination among different caregivers as a prerequisite to offer complete care

and this is a natural and logical complement to integrated care. Creating age-friendly environments requires actions to combat ageism and abuse, enable autonomy, and support healthy ageing in all policies and at all levels of government.

An integrated approach to ageing targeted at all the segments of health care is also likely to reduce the need for an expensive, interventionist hospital to be used most intensively in the senior population and particularly at the end of life care, thereby reducing costs. As health includes more than medicine, the integration of non-pharmacological, self-care interventions with medical services in the care of the senior and pre-senior population would improve the efficiency and sustainability of health care systems that are continuously facing increased costs partly precipitated by extended ageing demands and increased costs of advanced health care technologies.

While limiting cost is one approach to ensuring the sustainability of the health system faced with the challenge of extended ageing, creating innovative funding schemes to address differing needs caused by ageing is also important and a challenging prospect that requires a different perspective. When making policy recommendations, national governments need to consider the implications of these on general health, including healthy ageing, as defined by the WHO framework for country action.

The promotion of healthy ageing will have massive implications not only on health care costs but also on the quality of life for older persons. Every person – in every country in the world – should have the opportunity to live a long and healthy life. Yet, the environments in which we live can favour health or be harmful to it.

The quality of the living environment and spatial epidemiology plays an important role in defining the health risks of the population. Especially in the face of rapid urbanization which is considered an important contributor to the growing burden of mental health across European and world populations. Equitable access to high-quality green spaces, in the light of new research as well as Sustainable Development Goals, becomes an issue of environmental justice and highly policy-relevant approach in the endeavour to mitigate the negative effects of ageing in the urbanized world. Another important factor is accessibility to quality health regardless of social determinants of health and other sources of vulnerability. These issues became more and more apparent when considering the ageing of the population. Healthy ageing is about creating the socio-ecological climate and opportunities that enable people to be and do what they value throughout their lives.

Active and healthy ageing is a societal challenge shared by all European and other countries of the

world, but it is also an opportunity. It is important to acknowledge that the EU and European governments can learn from the experience of other countries the evidenced-based changes most effective in transforming their health systems to adjust to the growth of ageing populations. At the same time, governments within the EU can learn from each other as well. To that end, the EU and individual governments would be well to consider sustainable mechanisms to exchange data and learnings in this regard. It is a chance for Europe to establish itself as a global leader that can provide innovative solutions. Considering the current context, it is essential to take the lessons from the Coronavirus disease (COVID-19) pandemic which has particularly high fatality rates among very old people, notably those living in residential care, and chronic patients. It outlines the importance of disease prevention using hygiene measures, well known long-ago. It also has shown us all the importance of every person's involvement in creating a healthy environment, healthy relationships and the importance of mental health, building solidarity, and social awareness of health needs of those who are in danger, especially senior citizens. The WHO Decade of Healthy Ageing (2020–2030) is offering a unique opportunity to make this narrative a true reality for older persons, their families, and communities.

The scientific multidimensional concept of healthy ageing is defined as the process of developing and maintaining the functional ability that enables well-being in older age. As people age, their health needs tend to become more complex determined by specific health issues and specific health demands of older patients.

Therefore, the following issues need to be included as research areas in future research funding and planning through different European Commission research funding schemes in order to reduce mortality and morbidity of different age-related diseases:

1. *Translational research into brain diseases will improve insight into the basic functioning of the brain.*
2. *Research into causal relationships and mechanisms that can reduce and prevent frailty syndrome in the older population.*
3. *Research into repercussions of neurological and mental health conditions on society as a whole.*
4. *Research into sleep disorders strongly associated with age.*
5. *Special emphasis should be put on the research of gender, income, and geographically related differences in the burden of disease in the older population and public health research into health promotion and disease prevention of age-related conditions.*

6. *Research in novel AI and IT solutions that can help in promoting health, preventing disease and alleviating in the burden of disease in age-related conditions and improve health in the older population.*
7. *Research on factors and causes that are connected with the issues of polypharmacy and concrete ways to prevent mortality and morbidity that is related to it especially in the older population. (DIRECTORATE-GENERAL SANTE is responsible for EU policy on food safety and health and for monitoring the implementation of related laws. Through its scope of action together with the European medicines Agency (EMA) can play an important role in the implementation of successful policies related to polypharmacy.)*
8. *Develop EU-wide coordinating mechanisms to increase the speed, efficiency and effectiveness of clinical trials and establish clinical testing for drugs targeting ageing in older patients with multiple chronic conditions (Here the European medicines Agency (EMA) can play an important role by introducing policies that will support the testing in clinical trials with a new class of drugs and integrate their use with existing public health interventions are required.)*
9. *Project for education and training of both caretakers and caregivers in issues related to specific conditions related to ageing should be introduced and funded through EU funding schemes.*
10. *Projects that are oriented to reducing vulnerability and improving resilience, reducing social isolation and promoting social inclusion of older populations across EU also those projects that are oriented to healthy urban planning should be introduced and funded through EU funding schemes.*
11. *Support sustainable mechanisms within the EU and between the EU countries and other countries to exchange data and learnings regarding the most effective evidence-based practices and innovations needed to transform national health systems in a manner best suited to prevent, treat and care for the chronic and social conditions affecting the health and well-being of older populations.*
12. *Finally, within the European Commission the following issues should be addressed and discussed:*
 - a) *Is there a need to agree on the EU level for creation for Pan European Policies that will define the minimum standard of social care and health care to all European citizens' especially older population? This will entail the creation of a special fund that can help reduce*

inequality across different age groups and different EU member states.

- b) *In the light of COVID-19 pandemic which has particularly high fatality rates among very old people, notably those living in residential care and chronic patients to come to an agreement on the EU level for creation for Pan European Policies that can in the future help in better coordination of rapid response among EU members states that will be based on the principle of solidarity and subsidiary in emergencies taking into account specific needs of each EU member state?*

RESOURCES:

- AGE Ageing Report 2018
- Decade of Healthy Ageing 2020–2030 – a final proposal at the 146th WHO Executive Board meeting in February 2020. Geneva: WHO; 2020. Available from: https://www.who.int/docs/default-source/decade-of-healthy-ageing/final-decade-proposal/decadeproposal-final-apr2020-en.pdf?sfvrsn=b4b75ebc_3. Accessed: April 17, 2020.
- Europe 2020 – A European strategy for smart, sustainable and inclusive growth. Brussels: European Commission; 2020. Available from: <https://ec.europa.eu/eu2020/pdf/COMPLET%20EN%20BARROSO%20%20%20007%20-%20Europe%2020%20-%20EN%20version.pdf>. Accessed: April 17, 2020.
- European Innovation Partnership on Active and Healthy Ageing (EIP on AHA). Brussels: European Commission; c2020. Available from: https://ec.europa.eu/eip/ageing/home_en. Accessed: April 17, 2020.
- EuroHealthNet 2018 data.
- Global Alliance for Chronic Diseases, Joint Programming Initiative “More Years, Better Lives – the Challenges and Opportunities of Demographic Change”
- Joint Programming on Neurodegenerative Diseases Research and similar partnerships.
- Horizon 2020 Work Programme 2018–2020 – 8. Health, demographic change and wellbeing. Brussels: European Commission; 2020. Available from: https://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-health_en.pdf. Accessed: April 17, 2020.
- The 2018 Ageing Report: Economic and Budgetary Projections for the EU Member States (2016–2070)
- Xue QL. The frailty syndrome: definition and natural history. Clin Geriatr Med. 2011; 1–15. Medline:21093718 doi:10.1016/j.cger.2010.08.009.