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A narrative review and expert consensus on barriers, facilitators, and research gaps to healthy and positive ageing – Position of the Multidisciplinary International Positive Ageing Group (MIPAG)

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ABSTRACT

Recent developments in healthcare and scientific research have shifted the perception of ageing from a period of decline to recognising its potential for sustained functional ability, well-being, and societal contributions. In light of this perspective, a multidisciplinary panel of experts from five European countries conducted a narrative review of the literature. It convened for a one-day consensus meeting to identify key barriers, facilitators, and research priorities related to healthy ageing. Thus, this paper aims to (1) define the concept of positive ageing, (2) discuss barriers and facilitators to healthy ageing, (3) examine the role of healthcare professionals in maintaining and improving intrinsic capacity, and (4) propose a research agenda to address gaps in healthy ageing. The panel identified 70 barriers and 64 facilitators, structured within the WHO's ICOPE framework, related to intrinsic capacity. Twenty-six interventions across five domains—locomotor, sensory, psychological, cognitive capacities, and vitality—were proposed, aimed at both frail and robust individuals, focusing on social integration, psychological well-being, physiological resilience, deficit management, and disorder prevention. The panel also outlined a research agenda emphasising AI-driven ageing support, improved communication strategies, early frailty detection, and the development of locally adapted guidelines and infrastructure for healthy and positive ageing. This framework emphasizes the importance of early-life interventions and advocates for a preventive, holistic, and multidisciplinary approach to aging. In conclusion, the MIPAG's fosters a proactive mindset and early interventions throughout life to prevent the decline and optimise intrinsic capacity.

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1. Introduction

Progress in medicine and public health has significantly increased life expectancy worldwide (Bautmans et al., 2022; Rudnicka et al., 2020; World Health Organization, 2015). By 2050, it is estimated that the number of people aged 60 and older will triple, and individuals over 80 will reach 426 million globally (United Nations, n.d.; World Health Organization, n.d.), straining healthcare, social systems, and the workforce. Extending life lived in good health, free from serious illness or disability, is thus this century's critical economic and social challenge.

While ageing may benefit emotional maturity and decision-making, it may lead to a decline in physiological, cognitive, and physical functions. As per the WHO's ageing framework, a multidisciplinary and preventive approach is crucial for maintaining well-being, social participation, and functional ability (FA) – the capability to perform daily tasks in real-life settings –, in later life (Koivunen et al., 2022). FA emerges from the interplay between an individual's intrinsic capacity (IC) – the composite of physical and mental capacities – and the surrounding environment (Bautmans et al., 2022; Beard et al., 2015; López-Ortiz et al., 2022; Rudnicka et al., 2020). The 2015 WHO Report on Ageing and Health frames IC as a multidimensional construct, including sensory, psychological, cognitive, locomotor functions, and vitality. Emphasizing a life-course perspective, this framework supports the use of IC to predict functional decline and inform assessments, interventions, and policies aimed at preserving older adults' FA (Bautmans et al., 2022; Falk Erhag et al., 2022; Rudnicka et al., 2020). Beyond IC, evidence also indicates that the healthspan-lifespan gap poses a significant threat to healthy longevity. Therefore, extending health span, along with compression of morbidity and optimization of IC, are two possible approaches (Garmany and Terzic, 2024; Lantz, 2020).

WHO defines healthy ageing as "the process of developing and maintaining the FA that enables well-being in older age" (Beard et al., 2015), emphasizing the optimization of IC and FA to support healthy ageing. The WHO's Integrated Care for Older People (ICOPE) framework promotes a community-based strategy for person-centred assessment and intervention at the primary care level. It includes care pathways to screen for conditions associated with declining intrinsic capacity and, where needed, guides personalized care plans to mitigate IC decline, treat disease, and address social care needs.

Ageing is a multidimensional process with multisectoral challenges (Bautmans et al., 2022; Rudnicka et al., 2020; Shevelkova et al., 2023). Although the United Nations sets 60 years as the cut-off for older age, ageing starts earlier and varies by genetics, health-related behaviours, and environment. Research indicates that earlier actions may enhance and slow IC decline (Minichiello and Coulson, 2005; Poulain and Mackowicz, 2022).

To broaden the ICOPE framework and reframe ageing as a period of opportunity for longevity and sustained and well-being, rather than inevitable IC decline, the Multidisciplinary International Positive Ageing Group (MIPAG) united experts in physiotherapy, psychiatry, integrative medicine, neurology, preventive and physical medicine, rehabilitation, geriatrics, and nutrition across five European countries to discuss the new concept of Positive Ageing (PA). PA is an approach to achieve healthy ageing, framing ageing as a natural and universal process during which IC can be optimized through proactive, early-life interventions across multiple domains at the individual level. It emphasizes physical, mental, and emotional well-being, as well as salutogenesis (a health concept that focuses on factors that promote health and well-being, rather than the causes of disease). PA involves intentionally adopting healthy behaviours to support long lives with maintained quality of life, meaningful outcomes, autonomy, and freedom from disability. Interventions encompassed by PA may enhance physiological reserve and strengthen resilience during life transitions, regardless of whether the challenges are physical, social, economic, psychological, or emotional. Additionally, PA aims to prevent IC decline by leveraging new technologies and health education and literacy.

ICOPE and PA are complementary approaches to achieving healthy ageing (Fig. 1). The PA approach is strongly inspired by the ICOPE rationale, which emphasizes assessing and managing IC by addressing its key domains: locomotion, sensory (hearing and vision), psychological, cognition, and vitality. Some differences can be observed between the ICOPE and PA approaches, the most significant being the chronological age of the target population and the initial level of IC at which each approach typically begins. Overall, the PA approach relies more on prevention and preparation, rather than on managing deficits, as emphasized in the ICOPE framework. In this paper, the MIPAG focuses on identifying, based on a literature search, the barriers, the facilitators, and the impact of various healthcare disciplines in promoting PA. The main objectives were to (1) examine societal and individual barriers and facilitators to PA; (2) explore the role of healthcare professionals (HCPs) and organisations (HCOs) in maintaining IC; and (3) propose a research agenda to address gaps in PA.

2. Method

A multidisciplinary panel of experts from five European countries was formed based on their expertise in geriatrics and nutrition, integrative medicine and neurology, physiotherapy, psychiatry, preventive medicine, and rehabilitation. The MIPAG group was formed in December 2023. The experts have been selected based on their domain of expertise, experience (research and/or clinical practice), geographical influence, participation in national and international networks, and teamwork ability. An external consulting company performed the screening and profile based on Google information, and the chair made the final selection of the group (YH). This review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)-NR standard. A PubMed literature review included clinical trials, meta-analyses, randomised controlled trials, reviews, and systematic reviews published between January 1, 2022, and April 3, 2024. Regarding the search conducted on PubMed, a combination of the MeSH terms and free language was used. The search equation and keywords are detailed in Supplementary File 1. Only papers published in English and reporting the analysis of barriers, facilitators, limitations, and gaps in positive and healthy ageing were included.

Articles were screened independently by two authors.

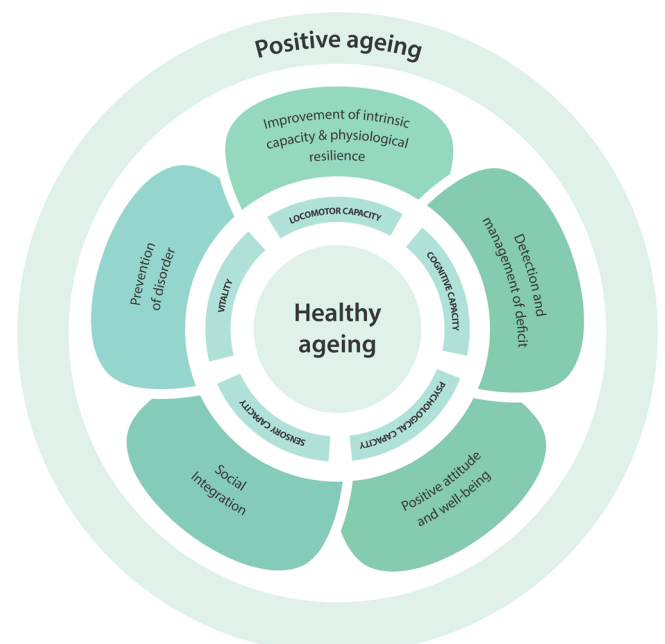


Fig. 1. Schematic representation of the Positive Ageing (PA) concept.

Supplementary files of all papers analysed and relevant data were included in this review (Supplementary file 2). Each expert screened titles and abstracts pertinent to their area of expertise, selecting eligible articles based on predefined criteria. Full-text assessments were conducted, with secondary expert consultation (YH) in cases of uncertainty. Data extraction focused on identifying barriers and facilitators of healthy ageing. A one-day face-to-face meeting in Paris (2024) enabled experts to synthesize findings, categorize key barriers and facilitators, and establish consensus on their impact, disciplinary roles, and priority research areas based on a qualitative evidence synthesis.

Barriers and facilitators were categorized into societal and individual items and presented in tables. A list of research topics has been generated through literature review, expert input, and a brainstorming session. The experts were asked to prioritize all items from most to least important. Each priority was rated on a scale (e.g., 1–5) indicating its importance. YH calculated the mean score. Before submission, the MIPAG performed the following steps: (1) email discussions and videoconferences for draft revisions and (2) peer review by four additional experts selected for their expertise.

In total, 10 experts from eight countries contributed to this paper.

3. Results

One hundred eighteen articles were included in the narrative review, which was used to identify facilitators and barriers, the role of

healthcare providers, and the research question on positive and healthy aging (Fig. 2, Supplementary file 2).

3.1. The barriers and facilitators of healthy and positive ageing

The identified barriers and facilitators were categorized into two groups: (I) societal and (II) individual (Tables 1 and 2). Societal factors refer to the structural, systemic, or contextual influences that are shaped by policies, institutions, environments, and collective practices. These include healthcare and educational systems, social inequality, environmental conditions, and global or cultural norms. Individual factors refer to those that directly affect personal behaviours, physiological health, cognitive-emotional traits, and one’s immediate social or built environment, including how an individual experiences and navigates it. Barriers and facilitators often overlap, depending on the context.

Education is categorized under societal factors because it reflects systemic societal inputs, such as formal instruction, cultural messaging, and public awareness efforts that shape perceptions of ageing. The social and urban environment is classified under individual factors because it encompasses the immediate physical and social settings that an individual directly interacts with on a daily basis, such as housing design, access to transportation, and the neighbourhood’s infrastructure.

Addressing individual barriers can mitigate societal ones – and vice versa (Table 1) (Riadi et al., 2022; Schroeder et al., 2023; Shevelkova et al., 2023; Thomas et al., 2023; World Health Organization, 2017;

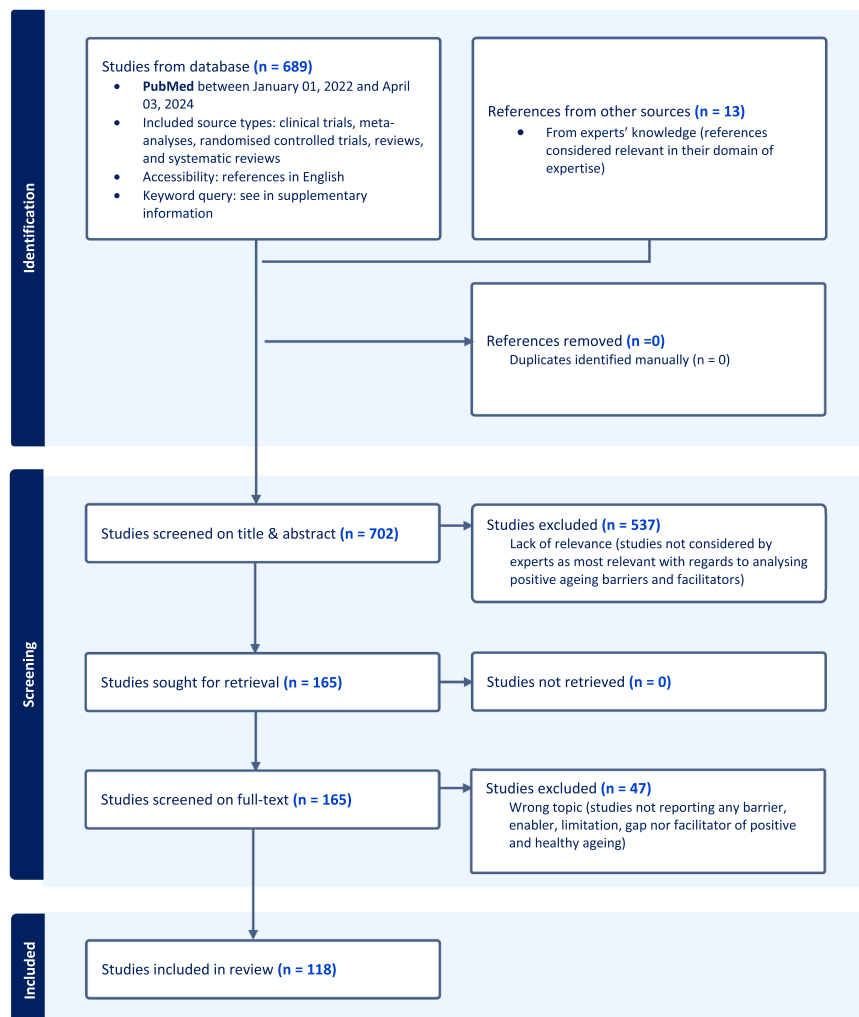


Fig. 2. Flow-chart of papers selection on Pubmed database following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)-NR standard.

Table 1
Barriers to healthy and positive ageing.

BARRIERS TO HEALTHY AND POSITIVE AGEING		
I. Societal barriers	Global society	<ul style="list-style-type: none"> - Sex and gender differences - Geopolitical context (e.g. wars, economic and social crises) - Lifestyle and cultural context - Climate change (e.g. temperature changes) - Ecological disasters (e.g. earthquakes, floods) - Discrimination - Unclear life expectations and goals
	Healthcare system (Falk Erhag et al., 2022; Guo et al., 2024; Lester et al., 2022)	<ul style="list-style-type: none"> - Lack of HCPs focused on ageing management (geriatricians) - Lack of training and skills in positive ageing - Lack of multidisciplinary teams - Lack of cultural sensitivity and training to work in multi- and interdisciplinary teams - Lack of communication, common objectives and shared decision-making among HCPs from different fields - Lack of research on patient's needs, beliefs, goals and preferences - Poor involvement of policymakers and funding agencies impacting research prioritisation - Misuse of GDPR (e.g. obtaining insurance, bank loan)
	HCPs practice (Cesari et al., 2022; Reynolds et al., 2022)	<ul style="list-style-type: none"> - Lack of investment in professional development and educational activities - Poor support or counselling on the use of specific devices (e.g. assistance during the adaptation period for hearing devices) - Insufficient monitoring of non-pharmacological and pharmacological treatment adherence - Inaccurate or inefficient methods and resources of healthy ageing assessment - Poor HCP knowledge of nutrition, physical activity, mental health, and sleep disorders and lack of training in providing recommendations
	Social inequality (Cuadra et al., 2023; Dominguez et al., 2024; Goins et al., 2022; Syuhada et al., 2022)	<ul style="list-style-type: none"> - Unequal access to resources and health support - Availability of resources in high- versus low- and middle-income countries - Social, economic, and educational inequality - Economic burden of healthy and high-quality dietary and physical activity habits - Limited access to healthy food, physical activity, walking and hearing aids, medical care, vaccination, and mental health support

Table 1 (continued)

BARRIERS TO HEALTHY AND POSITIVE AGEING		
II. Individual barriers	Ageism (Ishikawa, 2023; Reynolds et al., 2022; Rudnicka et al., 2020)	<ul style="list-style-type: none"> - Healthcare-related ageism - Institutional ageism - Social ageism - Socially stigmatising walking aids and hearing aid use - Social stigma and associated embarrassment lead to social segregation
	Education (Banerjee Kolkata et al., 2022; Dominguez et al., 2024; Govindaraju et al., 2022; Hu, 2024; Ishikawa, 2023)	<ul style="list-style-type: none"> - Negative and prejudiced societal perceptions and perspectives on ageing - Lack of knowledge and awareness about healthy nutrition and healthy habits - Lack of ageing education and awareness throughout life - Lack of empathy towards older persons - Lack of knowledge and education on ageing of other stakeholders like architects, policymakers or street educators
	Digital environment (Chen et al., 2023; De Santis et al., 2022; Riadi et al., 2022; Schroeder et al., 2023; Theodore Armand et al., 2024; Thomas et al., 2023)	<ul style="list-style-type: none"> - Limited access to new technologies - Limited support in the use of digital tools - Lack of engagement with e-health tools - Digital exclusion and lack of assistance adapted to older people - Few e-tools to support the daily life activities of older individuals, including their travels - Free e-tools focused on the prevention
	Social and urban environments (Abud et al., 2022; Deng et al., 2023; Pellegrini-Laplagne et al., 2023; Wood et al., 2022; Zhou et al., 2022)	<ul style="list-style-type: none"> - Architectural barriers (housing infrastructure, available elevators, access to commerce and services) - Limited access to transportation and vehicles not adapted to persons with disability - Environment not adapted to persons with disability, sensory and cognitive impairment
Cultural environment (Clark et al., 2023; Dominguez et al., 2024; Neumann et al., 2022)	<ul style="list-style-type: none"> - Poor promotion and accessibility of cultural activities and sports as opportunities for social inclusion, rehabilitation, and fulfilment - Lack of cultural activities adapted to ageing-related sensory and cognitive impairment 	
Health problems (Koivunen et al., 2022; Ticinesi et al., 2024)	<ul style="list-style-type: none"> - Food habits (e.g., food culture, ultra-processed food consumption) - Decline of sensory functions (e.g. hearing, vision, taste) - Falls and fear of falls - Loss of appetite (anorexia of ageing) - Decline of proprioception/balance - Poor oral health (e.g. edentulism, xerostomia) - Loss of appetite - Speech or swallowing disorders 	

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Table 1 (continued)

BARRIERS TO HEALTHY AND POSITIVE AGEING	
	<ul style="list-style-type: none"> - Involuntary movements (due to drugs or disease) - Continence dysfunctions - Lack of adherence to medical recommendations - Poor health literacy - Sleep disorders and diurnal hypersomnia - Comorbidities and injuries (e.g. chronic pain, multisite musculoskeletal pain, sarcopenia) - Associated difficulties (e.g. poor sleep quality, phobias, and stress) and reduced ability to cope and adapt to these difficulties - Poor self-esteem due to functional, sensory, and cognitive decline - Dysbiosis and intestinal barrier dysfunction - Overburdened with medical treatment and procedures - Loneliness, social isolation - Ageism - Extreme sedentary behaviours - Barriers to community participation - Impaired spatial navigation skills
<p>Isolation (De Maio et al., 2022; Hussain et al., 2023; Pellegrini-Laplagne et al., 2023; Wood et al., 2022)</p>	

HCP = Healthcare Professionals; GDPR = General Data Protection Regulation

Zhou et al., 2022). Social age stereotypes, for example, shape self-perceptions of ageing, reinforcing ageism at institutional, interpersonal, and personal levels, impacting overall health (Ishikawa, 2023). Awareness campaigns can shift these perceptions, promoting inclusivity and sustaining social engagement (World Health Organization, 2015).

While digital technology may support self-care, encourage healthy behaviours, enable remote healthcare, and maintain IC, it requires training, support, and device access (Bachofner et al., 2024; Chen et al., 2023; De Santis et al., 2022; Sween et al., 2014; Theodore Armand et al., 2024). Cultural factors similarly influence healthcare engagement, needing tailored interventions to improve adherence to healthier lifestyles. In some communities, for example, traditional dietary habits may conflict with nutritional recommendations. Therefore, these recommendations should be adapted to incorporate local foods and customs, achieving a practical balance between cultural practices and dietary guidelines. Chronic conditions like pain or diabetes, often seen as barriers, can encourage healthier habits when effectively managed and communicated by healthcare professionals (Choudry and Ganti, 2024).

Physical activity recommendations must fit individual lifestyles and physical conditions, ensuring sustainability and participation (Liao et al., 2023). Structured exercise programs must reflect personal needs, with multi-component interventions—combining aerobic, endurance, strength, and balance training—enhancing physical, cognitive, and emotional function while reducing disability risk (Bernabei et al., 2022). Dance, yoga, Pilates, and non-competitive sports further support general well-being (Pinheiro et al., 2022). Chinese practices such as Tai Chi and Qi Gong can prevent muscle atrophy and strengthen sarcopenic older adults (Guo et al., 2022).

Exercise should be combined with nutritional and cognitive interventions for synergistic benefits (Ngandu et al., 2015). Mediterranean diets can help prevent inflammation, dysbiosis, and cellular senescence, promoting overall health and reducing chronic disease risk (Dominguez et al., 2021). They may be recommended when accessible (Table 2).

Virtual reality (VR) is another example of a facilitators and barrier to

Table 2

Facilitators to healthy and positive ageing.

FACILITATORS TO HEALTHY AND POSITIVE AGEING		
<p>I. Societal facilitators</p>	<p>Global society (Abud et al., 2022; Bautmans et al., 2022; Krings et al., 2022; Thomas et al., 2023)</p> <p>Healthcare system (Boffetta and Collatuzzo, 2022; Falk Erhag et al., 2022; Koivunen et al., 2022)</p> <p>HCP practice (Falk Erhag et al., 2022; Guo et al., 2024)</p> <p>Digital environment (Chen et al., 2023; Coley et al., 2022; De Santis et al., 2022; Theodore Armand et al., 2024; Thomas et al., 2023; Wang et al., 2024)</p> <p>Access to health (Clark et al., 2023; Dominguez et al., 2024; Govindaraju et al., 2022; Hahm et al., 2023; Hu, 2024; Lorenzo et al., 2022)</p> <p>Diet (Clark et al., 2023; Dominguez et al., 2024; Govindaraju et al., 2022; Hahm et al., 2023; Hu, 2024; Lorenzo et al., 2022)</p>	<ul style="list-style-type: none"> - Trans-sectorial policies, global recommendations, funding for optimising devices - Organisation of public awareness campaigns - Reimbursement for ONS, rehabilitation, dentures, hearing devices and others. - Provide education and raise awareness about the needs of older individuals starting in childhood education. - Interventions focused on health span rather than life span (e.g. health interventions throughout life focused on healthy behaviours and prevention of diseases) - 4 P medicine implementation (preventive, participatory, personalised, predictive) - Early detection of the decline of intrinsic capacity and predictive signs of illness - Objective assessments and follow-ups - Progress in genetics studies - Progress in environmental studies - Progress in information and diffusion of appropriate non-pharmacological interventions - Working as multidisciplinary, interdisciplinary, and synergic teams - Interventions promoting <i>salutogenesis</i> versus pathogenesis - Improvement of HCPs' communication skills (e.g. more training in how to motivate patients) - Improvement of cultural understanding among HCPs - Access to digital tools (assistive care technologies) - Development, implementation, and promotion of e-health interventions - Improvement of homecare with AI (e.g. fall detection) - Personal support on the use of digital applications - Easy access to healthcare and medical support - Access to cost-effective non-pharmacological and pharmacological interventions, including vaccination - Diet restoring and maintaining homeostasis (e.g. anti-inflammatory, antioxidant, prebiotic, probiotic, postbiotic) - Recognition of the strong correlation between healthy dietary habits and physical activity to healthy ageing

(continued on next page)

Table 2 (continued)

FACILITATORS TO HEALTHY AND POSITIVE AGEING	
	<ul style="list-style-type: none"> - Understanding the strong correlation between diet and chronic diseases - Diet-related guidelines - Diet education to promote long-term healthy eating behaviours - Policies on nutrition, including education and awareness campaigns - Rapid assessment of individual's nutritional needs by qualified professionals - Focus on food quality versus quantity - Improving the taste of healthy foods - Personalised advice on the intake of high-quality protein - Considering the gut-brain axis on diet advice (correlates with general health and cognitive agility) - High-quality food supplements - Food and drug interactions-education and awareness - Safe, inclusive, and disability-friendly environmental infrastructure (e.g. quiet, shared garden, seats, ramps, elevators, well-maintained infrastructures) - Individual living space adaptation to the changing needs (e.g. fall prevention) - Age-friendly sustainable cities and communities - Urban facilitators (transportation, housing, access to commerce and public places) - Financial security and care support (individual and caregiver costs) - Financial literacy - Availability of community support (e.g. network associations, senior-specific programs, available caregivers) - Promote social links, community participation, and engagement - Promote the adoption of hobbies - Offer labour access to older people - Developing and maintaining high intrinsic capacity - Maintain good personal hygiene (e.g. oral hygiene) - Rational drug management and counselling - Preventive and curative interventions against chronic diseases (e.g. integrating genetics, behaviour change, digital health) - Patient organisations and therapeutic groups - Implementation of protective factors and determinants of healthy ageing (e.g. education, engagement with cultural and religious
II. Individual facilitators	<p>Social and urban environment (Krings et al., 2022; Shevelkova et al., 2023; Wood et al., 2022; World Health Organization, 2017; Zhou et al., 2022)</p> <p>Individual's socio-cultural environment (Gough et al., 2022; Provencher et al., 2022; Wood et al., 2022)</p> <p>General Health (Koivunen et al., 2022)</p>

Table 2 (continued)

FACILITATORS TO HEALTHY AND POSITIVE AGEING	
	<ul style="list-style-type: none"> practices, stress reduction, sleep quality, sexuality, meditation, sophrology, and physical activity) - Preparation for ageing at different stages of life (from primary school to professional environment) - Promoting resilience and adaptation to change with a positive attitude - Promoting meaningful life and life goals - Maintaining optimism - Motivating to adopt healthy ageing principles (e.g. continuous monitoring through apps, HCPs, or self-assessments) - Preparation for retirement - Regular physical activity (decrease immobility, increase proprioception, resilience, fall prevention) - Exercise programs and group activities adapted to individual's needs, capacities, and preferences. - Spatial navigation training interventions - Motivational devices/systems to promote physical and cognitive exercise (e.g. exergaming, virtual reality) - Regular cognitive stimulation - Emotional support - Education on emotional intelligence - Socialisation - Sleep hygiene
	<p>Mindset (Farina et al., 2023; Goins et al., 2022; Popescu et al., 2023; Ubaida-Mohien et al., 2023)</p> <p>Physical agility (Cuadra et al., 2023; De Maio et al., 2022; Mattle et al., 2022; Sevcenko and Lindgren, 2022; Sween et al., 2014; Zheng et al., 2023; Zhou et al., 2022)</p> <p>Cognitive agility and emotions (Bonnehère and Klass, 2023; Gajdosova et al., 2023; Pellegrini-Laplagne et al., 2023; Rocha et al., 2023)</p>

HCP = Healthcare Professionals; AI = Artificial Intelligence; ONS = oral nutrition supplements.

exercise (Tables 1 and 2). VR enhances adherence by making exercise more engaging while improving balance and mobility (Chirico et al., 2023). Exergaming (exercise + gaming) integrates physical activity with entertainment, promoting sports participation and resilience (Sween et al., 2014). VR also supports motor imagery, stimulating motor learning without physical execution and counteracting cognitive and motor decline. Their interactive nature provides valuable feedback, enhances motor learning, and may aid recovery from illness (Passarello et al., 2022). In this context, screen time can facilitate rather than hinder exercise.

Music-based interventions can enhance exercise programs, improve adherence, and support motor and cognitive function. Learning an instrument fosters neural plasticity and fine motor skills, making it particularly beneficial for older adults (Rogers and Metzler-Baddeley, 2024).

Caregivers with coaching training can better motivate individuals to adopt healthier habits and a positive outlook on ageing (Lester et al., 2022). Prevention approaches, such as salutogenesis and P4 medicine (predictive, preventive, personalized, participatory medicine), offer lifelong health strategies that improve care and follow-up (Boffetta and Collatuzzo, 2022; Guo et al., 2024; Mittelmark et al., 2017). Trans-sectorial policies, public awareness campaigns, and global initiatives—such as the Global Network for Age-friendly Cities and Communities, the UN Decade of Healthy Ageing (2021–2030), and the WHO's healthy ageing framework—promote international collaboration and support healthier ageing (Cesari et al., 2022; Rudnicka et al., 2020; World Health Organization, 2019). Nevertheless, policies and

multidisciplinary health management must align with local cultures, economies, and environmental resources for these efforts to be effective.

Shifting from reactive care to an early preventive health approach is essential to mitigate IC decline in older adults (Abud et al., 2022; Rudnicka et al., 2020; Shevelkova et al., 2023). However, expanding access to such care earlier in life requires investment in socioeconomic, geopolitical, cultural, and local infrastructure (Cesari et al., 2022; Rudnicka et al., 2020; World Health Organization, 2019, 2015).

3.2. The lifelong integrated care for positive ageing

The MIPAG adopted the WHO's ICOPE framework and its key domains—locomotor, psychological, cognitive, hearing, visual, and vitality—to frame the role of different disciplines in PA. The "Lifelong Integrated Care for Positive Ageing" approach (Table 3) consolidates hearing and vision into a single sensory domain for practical discussion.

Interventions were categorised into five domains—locomotion, sensory, psychological, cognition, and vitality—applicable to frail and robust individuals. The vitality domain comprehensively addressed nutrition and disease management, aligning with MIPAG's preventive approach. This approach enabled us to tailor our recommendations to the individual's health status. The key MIPAG's recommendations for better care integrations were: (1) to integrate physical activity into daily life, taking into account individuals' locomotor capacities and their environment (Jyväkorpi et al., 2021; Lee et al., 2022; Milligen et al., 2019; Navarro-Lomas et al., 2024); (2) to detect early sensory function decline, and if a dysfunction is detected, to provide adapted visual and hearing aids (Bucholtz et al., 2021; Lin et al., 2023; Rovner et al., 2009; Shang et al., 2021; Yeo et al., 2023); (3) to identify psychosocial disorders early and, if necessary, implement appropriate treatment, socialisation activities, and cognitive behavioural therapy (Miniawi et al., 2022; Orgeta et al., 2022; Parry et al., 2014; Suárez-González et al., 2021; Vaccaro et al., 2022); (4) to optimize cognitive function and prevent its decline early in life and, if required, treat cognitive impairment; if not possible, propose appropriate support in activities of daily (Banerjee et al., 2022; Dubois et al., 2015; Ngandu et al., 2015; Parry et al., 2016; Profyri et al., 2022; Tsang et al., 2013; Zuin et al., 2022); (5) to promote a healthy lifestyle, including nutrition, chronic conditions management, physical and cognitive exercises, and sleep hygiene (Aryannezhad et al., 2024; Jyväkorpi et al., 2021; Navarro-Lomas et al., 2024; Ngandu et al., 2015; Sánchez-Sánchez et al., 2023).

3.3. A multidisciplinary framework to address positive ageing

MIPAG members emphasised the need for shared healthcare goals, prioritising IC maintenance through prevention and healthy habits rather than treating frailty. Early holistic interventions targeting IC domains are crucial for fostering healthy and PA (Fig. 3).

Shifting from siloed to integrated, multidisciplinary care is essential. Interdisciplinary care management effectively addresses chronic conditions like musculoskeletal pain and diabetes (Bujak et al., 2019; Yogasingam et al., 2023). Effective care requires a team spanning primary and specialised professionals—including general practitioners, nurses, physiotherapists, orthotists, neuropsychologists, and pharmacists—tailored to country-specific healthcare systems and individual needs.

A streamlined information flow supports personalised care, proper follow-up, and a comprehensive understanding of social conditions, history, and priorities. Collecting clinical and social data helps identify evolving health needs and evaluate public health interventions (Cesari et al., 2022).

Preparation for ageing is essential for healthy ageing and is increasingly recognised in research. Adequate preparation for older age can reduce anxiety and depression, while promoting healthier lifestyles (Kornadt and Rothermund, 2013). Challenges of older age include health, psychological, financial, housing, and social issues (Solhi et al.,

Table 3

The five domains of intrinsic capacity for integrated care approach discussed by the MIPAG panel and employed to robust and frail individuals.

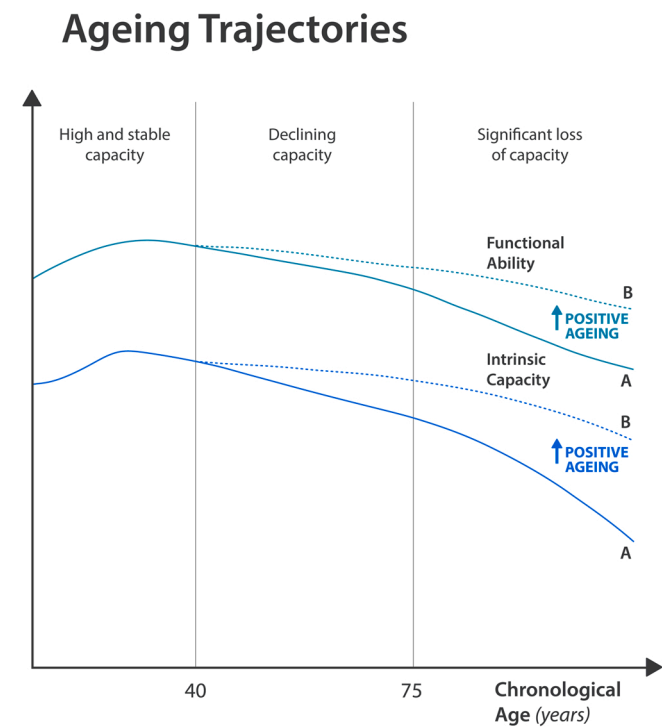
Lifelong integrated care for positive ageing		
	Robust (Highest intrinsic capacity)	Frail (Lowest intrinsic capacity)
Locomotor capacity	<ul style="list-style-type: none"> - Always recommend physical activity - Adapt the type and intensity of exercises according to individual preferences and comorbidities. - Associate physical activity with satisfaction. - Train health coaches about physical activity (disseminate more evidence-based advice) - Encourage physical activity counselling with qualified specialists. 	<ul style="list-style-type: none"> - Detect and manage dizziness and imbalance. - Adapt the type and intensity of exercises - Adapt architectural elements (e.g. stairs, doors, floors) - Identification and modification of risk factors for falls - Identification of causes of walking difficulties and propose rehabilitation to restore robustness
Sensory capacity	<ul style="list-style-type: none"> - Detect early sensory function decline (e.g. hearing, vision, taste) and recommend regular specialist check-up visits. - Promote behaviours that preserve hearing and vision functions (e.g. wearing protective eyewear and hearing protection) 	<ul style="list-style-type: none"> - Promote timely assessment of hearing and vision function - Provide treatment for hearing and visual difficulties. If not feasible or efficient, provide counselling and support on the use of hearing or visual aid medical devices
Psychological capacity	<ul style="list-style-type: none"> - Promote coaching and counselling as primary prevention approach - Recognise and modify risk factors for mental illnesses and professional burnout - Detect early mental illnesses (with a particular focus on anxiety, depression, and sleep disorders) - Detect addiction (drugs, alcohol) - Promote socialisation and psychotherapy - Adopt a positive mindset (e.g. spirituality, mindfulness, focus on good health instead of disease treatment) 	<ul style="list-style-type: none"> - Treat mental disorders in a timely and effective manner - Provide psychological support to caregivers - Promote socialisation - Promote Cognitive behavioural therapy (CBT) (A type of psychotherapy that helps individuals recognize and change negative thought and behaviour patterns. This structured, goal-oriented therapy focuses on the present to enhance thoughts, feelings, and behaviours.)
Cognitive capacity	<ul style="list-style-type: none"> - Prevent cognitive decline through activities and exercises stimulating cognitive function. - Promote intellectual and cultural leisure activities - Promote social inclusion - Reduce exposure to air pollution - Use of helmets to reduce the risk of traumatic brain injury - Recommend vaccination 	<ul style="list-style-type: none"> - Early detection of cognitive decline - Promote formal and informal cognitive stimulation - Provide Treatment (if feasible) and screening for potentially reversible causes of cognitive decline. - Treat cognitive impairment and, if not possible, propose appropriate support in activities of daily living. - Speech therapy
Vitality	<ul style="list-style-type: none"> - Assess the risk of chronic conditions and modify risk factors - Train health coaches on nutrition (disseminate more evidence-based advice) - Promote sleep hygiene 	<ul style="list-style-type: none"> - Treat chronic conditions and prevent exacerbations - Identify and reverse frailty (as it can limit access to specific treatments) - Assess drug prescription (including reconciliation of prescribed drugs,

(continued on next page)

Table 3 (continued)

Lifelong integrated care for positive ageing	
	<ul style="list-style-type: none"> - Screen and treat chronic pain - Refer to health coaches who are adequately educated and trained - Recommend vaccination
	<ul style="list-style-type: none"> prescription of new drugs and deprescription) - Encourage nutritional counselling and nutritional prescriptions with qualified specialists - Recommend vaccination
Common to both robust and frail	<ul style="list-style-type: none"> - Educate individuals about physical activity and nutrition - Involve and encourage relatives and HCPs to become "coaches." - Explore virtual and artificial reality (VR and AR) to boost motivation for physical activity (e.g. exergaming) - Adopting common goals among HCPs framework (e.g. to increase individuals' intrinsic capacity) - Consider associating diet and exercise recommendations with pleasure and fun (to create and sustain motivation) - Advice, treatments, and interventions should be integrated into individuals' daily life routines and habits (to maximise adherence) - Digital tools should be developed to connect patients with HCPs - HCPs should be better trained in nutrition, sleep disorders, sexual disturbances, treatment adherence, and early detection of cognitive and physical decline. - Dieticians and physical activity professionals should work with policymakers to develop nutrition and physical activity policies. - Social inclusion

HCP = Health Care Professionals; VR = Virtual Reality; AR = Advanced Reality.



Trajectories of Functional Ability and Intrinsic Capacity according to normal ageing (A) and to positive ageing (B)

Fig. 3. Trajectories of functional capacity and intrinsic capacities with ageing. The concept of positive ageing recommends starting to manage functional and intrinsic capacities earlier in life, to prevent and slow down their decline.

2022) and involve two key dimensions: (1) early-life planning (leisure, work, appearance, social connections, fitness) and (2) later-life concerns (independence, family support, healthcare, financial stability) (Kornadt

and Rothermund, 2013).

3.4. Research agenda and remaining questions

Following a literature review and expert discussions, the panel agreed on the key research priorities to address data gaps and necessary healthcare changes (Table 4). Priorities were ranked based on voting. The top research priorities include:

- I. AI and Digital Tools – Develop and validate AI and digital solutions to support PA, shift ageing perceptions, and help maintain IC.
- II. Older age Communication Strategies – Create and validate methods for engaging older adults, ensuring they can express their needs and access health education.
- III. Preventive Strategies – Implement multidimensional prevention strategies for early frailty detection (e.g. biomarkers).
- IV. Community-Based Ageing Guides – Develop accessible guidelines for PA tailored to the needs and resources of specific communities.

4. Conclusion and future recommendations

This paper explores barriers and facilitators to healthy ageing, providing a foundation for implementing a PA framework in healthcare and daily life. With ageing, the intrinsic capacity of individuals declines progressively since the age of 40 and ten more rapidly after 75 years old. PA aims to maintain, even increase IC, early in life to slow down their decline (Fig. 3). Addressing societal and individual challenges enables preventive measures to mitigate IC decline.

Table 4

Research agenda for the MIPAG panel, the scientific community, and other subjects to address.

Priority research subjects for the scientific community	
AI and digital tools to support positive ageing	<ul style="list-style-type: none"> • Develop applications to support ageing. • Assess how AI tools support positive ageing. • Develop a preventive care system focused on the early detection of frailty using all available resources (e.g. biomarkers) • Data collection and analysis through, for example, a registry.
Communication strategy with the general population	<ul style="list-style-type: none"> • Communication tools to reach people • Assess the literacy of the people concerned • Develop a guide for positive ageing that is accessible and adapted to local communities.
Other important priority subjects to address	
<ul style="list-style-type: none"> • Climate change adaptation in ageing people • Creating a Positive Ageing Care Pathway • Using AI to analyse big data • Developing a "one health" approach promoting <i>salutogenesis</i> • Developing tools/questionnaires to identify barriers and facilitators • Assessing individuals' self-perception (e.g. the question of aesthetics) • Focusing on interdisciplinarity instead of multidisciplinary • Defining the role of GP (Family and Primary Care specialists) in positive ageing • Informing all medical doctors worldwide about positive ageing approaches • Controlling inflammageing at the individual level • Defining a feasible method to estimate the amount of nutrient intake at an individual level • Incorporating interventions (physical, mental, cognitive, nutrition) in daily life activities • Using biomarkers (meaningful to the persons and valuable to the science and medical practice): <ul style="list-style-type: none"> ◦ Genotyping ◦ Better phenotyping of ageing people ◦ Genetics and epigenetics • Increasing adherence in general <ul style="list-style-type: none"> ◦ compliance to exercise and physical activities ◦ equip HCPs by teaching them motivational coaching skills and approaches • Describing the methods for being active • Creating a bio-feedback method for positive ageing (e.g. self-assessment) 	

MIPAG expanded the concept of healthy ageing, highlighting the need for proactive mental and physical preparation for the ageing process. PA requires reframing ageing as an opportunity for prolonged well-being rather than inevitable decline. To achieve this, we recommend targeted actions across five IC domains:

1. Social integration
2. Psychological well-being
3. Physiological resilience
4. Deficit management
5. Disorder prevention

A holistic, multidisciplinary, and person-centred approach should be initiated early, with an integrated healthcare framework tailored to individuals' robustness, functional abilities, independence, and environment.

Strengthening healthy ageing facilitators enables HCPs to implement effective facilitators, enhance IC, and reduce age-related burden. A multidisciplinary approach integrating prevention, treatment strategies, and improved collaboration and training will optimise health outcomes.

Education, self-management, and lifestyle changes are as crucial as healthcare approaches for achieving and maintaining sustained health. The lack of gerontology and geriatrics training in fields like architecture, psychology, sociology, industrial design, and engineering, combined with ageist cultures, hinders social inclusion and accessibility for older adults. Designing age-friendly environments is crucial for fostering PA.

This paper identifies barriers and facilitators to healthy and PA as a foundation for optimising IC at individual and societal levels, focused on prevention rather than intervention. The MIPAG highlights research gaps and the evolving role of emerging AI technologies, as well as the training of healthcare professionals, and proposes a preparatory phase for ageing, termed Positive Ageing, which integrates a proactive and resilient attitude as essential to long-term well-being and a productive older society. However, this paper has some limitations. One major issue is that the literature search was conducted in only one database, PubMed, and we did not assess the risk of bias in the included papers. While we acknowledge that comprehensive narrative reviews often incorporate multiple databases, this review is designed as a narrative review, rather than a systematic or scoping review. The goal is conceptual synthesis rather than exhaustive coverage, and limiting to PubMed helps maintain focus, feasibility, and manageability of the review process. Another limitation is the low number of experts participating in this consensus and the interpretation of the data. Indeed, only five European countries were represented, limiting the generalizability of our recommendations. Another risk of bias is that an unrestricted grant from industry supported the MIPAG work.

Overall, compared to other international guidelines, the main strength of this working group was that we focused on prevention, early detection and management of intrinsic capacities, while others indicate how to manage decline and ageing disorders. Finally, we paid particular attention to well-being and to the implementation on AI in the maintenance of physical cognitive functions.

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Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the scientific writer used Grammarly® for spell check and to improve language and readability. After using this tool, the scientific writer and author(s) reviewed and edited the content as needed and take full responsibility for the content of the publication.

Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests. Henrotin Yves reports financial support, administrative support, article publishing charges, and writing assistance were provided by Laboratoires Expanscience SA. Henrotin Yves reports a relationship with Laboratoires Expanscience SA that includes: consulting or advisory and speaking and lecture fees. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.arr.2025.102847.

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