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Perspective

Age-Friendly Ecosystems: Expert Voices from the Field

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Abstract: (1) Background: With the growth of the age-friendly movement, age-friendly ecosystems (AFE) garnered more attention. The successful development of an AFE is contingent on unified efforts across different stakeholders; however, limited efforts were made to help create a common understanding of the necessary components of an AFE. (2) Methodology: In response, The John A. Hartford Foundation and The Age-Friendly Institute hosted a series of convenings of international experts to identify a working definition of the characteristics composing an AFE. The goal of these convenings was to provide a foundation on which to unite cross-sector age-friendly work. (3) Results: This paper discussed the findings of the convenings and provided a framework from which future age-friendly work must draw upon. (4) Conclusions: This paper presented a necessary change in how we conceive AFEs.

Keywords: age-friendly; ecosystems; aging; measurement

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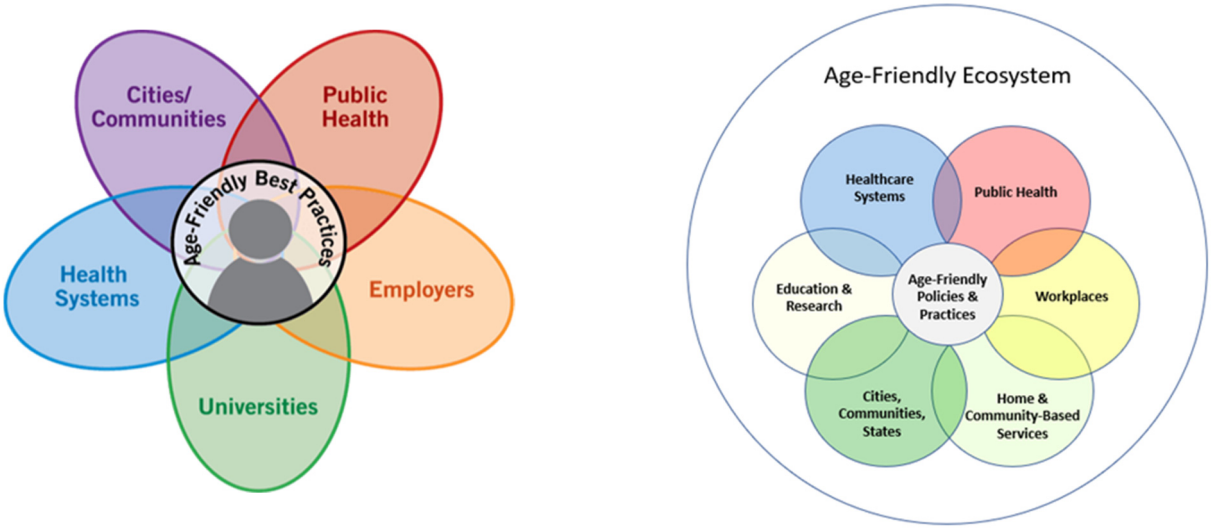
1. Defining an Age-Friendly Ecosystem

The growth in scholarship, civic planning, and programming in age-friendly initiatives led to progress across various sectors, but currently, the efforts were mainly conducted independently of each other. A coordinated effort across age-friendly sectors (health systems, cities/communities, universities, public health, and employers) to operationalize an age-friendly ecosystem (AFE) began to advance the existing work and to work across the various spheres of the AFE. This effort aims to address the comprehensive needs of all older adults and achieve a broader, collective, and long-lasting impact. An age-friendly ecosystem is defined as a comprehensive, collectively built, ever-expanding platform whose goal is to improve quality of life for older adults around the world through enhanced, collaborative impact. The age-friendly ecosystem does not propose a hierarchy of any particular approach to improving quality of life for older adults. Rather, this platform acknowledges the unique strengths and contributions of existing approaches and promotes enhanced continuity and collective impact across settings [1]. The purpose of this paper is to document the voices of 57 international experts who came together to achieve agreement on a series of six characteristics that define an AFE [2]. We previously published a technical report that described the six characteristics. In this paper, we elucidate the voices of the experts in order to characterize the features of importance to the varied stakeholders [1]. All the invited experts agreed that it is valuable to build on the existing work started in multiple sectors and countries worldwide, based on the premise that an AFE is required to achieve well-being for older adults globally (expert participants are listed in Appendix A). By communicating across sites where older adults live, work, and receive health care and caregiving, all of us are strengthened. The collaboration aims to design and implement a shared language and metrics that can help ensure inclusivity and well-being as determined by individual biology, personal choices, relationships with others, home settings, neighborhoods, healthcare settings, and workplaces [3].

2. Understanding of Age-Friendly Ecosystems

The age-friendly ecosystem comprises public health systems, cities and communities, health systems, universities, and employers [1]. Each of these sectors currently follows a guiding "age-friendly" framework. Understanding shared characteristics across these frameworks will help unite work and move towards an AFE. The COVID-19 pandemic spotlighted the pitfalls in our current approach toward older adult well-being and provided an environment to encourage more stakeholders to incorporate age-friendly approaches [4]. The overarching goal of an age-friendly ecosystem is to ensure a collective effort across the various sectors (Figure 1) and engage stakeholders who can shape the ultimate goal of improving the quality of life for older adults. In creating the AFE, a common language, shared metrics can help guide collaboration across sectors [2]. The AFE is crucial because it enhances individual efforts and creates a greater collective impact. Now more than ever, it is clear that the impact of the environment on older adults, specifically on their health and well-being, must be considered. Developing a shared definition and working to create an AFE can ameliorate our current state of discoordination and improve the lives of older adults, their families, and their caretakers.



(**A**) (**B**)

Figure 1. (**A**) Evolving Age-Friendly Ecosystem Sectors [5] IHI 2023. (**B**) Evolving Age-Friendly Ecosystem Sectors.

3. Defining the Age-Friendly Ecosystem

The importance of AFEs is becoming more widely accepted, but there is still great potential for collaboration across sectors. Most age-friendly work was conducted on an organizational level, with individual hospitals, health systems, and communities incorporating age-friendly approaches [4]. Synergies across different institutions are required to continue building momentum; however, this can only be effectively undertaken by first embracing a shared language and understanding the characteristics that compose an AFE [2,6].

4. The Approach

The need described above led to a series of convenings involving 57 international experts to determine a common understanding of the definition and the shared characteristics of an AFE which were described previously [1]. Creating that shared language facilitates partnerships across sectors to bolster the efficacy of different programs, and identifies standardized measures to assess community needs, efficacy, and outcomes [7]. These measures help ensure that programs are evidence-based and linked to positive outcomes and meaningful change. This is a crucial next step as it will help scale up ongoing work.

To begin the collaboration, 44 international experts joined together to use an expert panel approach to address the aim.

5. Methodology

The John A. Hartford Foundation and The Age-Friendly Institute hosted a series of three conventions of national and international experts to discuss AFE definition and characteristics. Experts convened virtually to review characteristics identified via a stakeholder survey, literature review, synthesis, and thematic analysis. Fifty-seven leaders of organizations representing educational, employment, healthcare, and urban and regional planning sectors agreed to participate, including the heads of influential private and corporate foundations, international and national non-governmental organizations, government agencies, academic institutions, and healthcare organizations. A Delphi technique, also known as estimate–talk–estimate approach was used to reach saturation [1].

In anticipation of the first session, participating experts reviewed the characteristics and supporting practices gleaned from the literature that comprise AFEs prior to the convening (please see Appendix B).

Session 1, held in December 2020, was opened by asking participants to share words they most associate with the term "age-friendly" (Figure 2).

Figure 2. Expert Voices Were Asked to Describe Age-Friendly.

Experts were then divided into four groups with representatives of different sectors included in each of the four groups. All breakout sessions were audio-recorded and note takers documented major themes that group facilitators presented back to the larger group for discussion and comment. Summary reports from the session and more detailed information about the characteristics and associated measures can be found on the John A. Hartford Foundation website (https://www.johnahartford.org/grants-strategy/current-strategies/age-friendly/age-friendly-ecosystem, accessed on 24 February 2023). During the first small group breakout, trained facilitators asked group members to address three main questions after having reviewed methods used to derive initial characteristics or ways of describing an AFE: Are these the best characteristics to describe an AFE? Why or why not? Tell us how you think the characteristics work across initiatives (your own work and that of others). Are there characteristics that we are missing? During the second small group breakout, participants indicated which of the following actions would have the greatest impact on development of a working AFE: identifying where we have the most in common to overcome separated approaches to our work; overcoming fears that an AFE will add an additional layer to our work; identifying foundation and government support to address payment barriers to achieving the work; encouraging additional major leadership from groups such as WHO, AARP, and others to tackle policy barriers; and demonstrating value, cost savings, and efficiency to overcome inertia.

Following the first session, a synthesis of learnings was conducted which surfaced updates to the first draft of shared characteristics based on collective thinking across fields. The updated characteristics of an AFE are outlined in Table 1 below. The updated shared

characteristics of an AFE were shared with expert participants in advance of the second session.

Table 1. Six Characteristics Comparing AFEs [2].

Responsive	The AFE is not a rigid framework. It should adapt and be responsive to the values and preferences of older adults identified through data collection and program assessments.
Equitable	AFEs should provide services that reach all older adults to mitigate inequity across all demographic factors.
Engaging	Engaging refers to including older adults in ways to bolster their quality of life and benefit society. This can be carried out in various ways, such as in an age-diversified workplace.
Healthful	AFEs should not solely focus on supporting the older adult but also empowering them to have agency in developing a healthful and high quality of life.
Active	Programs should focus on improving older adults' mobility, which contributes to feelings of freedom and independence. Improvements to our built environments, such as walkability and reliable public transportation, are examples of ways to target this characteristic.
Respectful	Older adults should be respected and valued by society. Ageism led older adults to hide care needs due to fear of being seen as dependent and incapable. Redefining aging in a positive light can help improve older adults' health outcomes.

The goal of the second session, held in March 2021, was to build upon our work in December by exploring areas for collaboration across sectors, beginning to identify measures that can be aligned across age friendly settings, and developing shared understandings of an age-friendly ecosystem in order that it can become an actionable roadmap for practitioners. The second session began with participants responding to the question "What will be the number one benefit that will be achieved by organizations by becoming part of an age-friendly ecosystem?". Responses from attendees can be found in Table 2 below.

Table 2. Various Expert Voices Highlights Number One Benefit that will be Achieved from AFEs.

Jody Shue, Executive Director of The Age Friendly Foundation asked attendees to answer the following question in the chat at the beginning of the meeting: What will be the number one benefit that will be achieved by organizations becoming part of an age-friendly ecosystem? Responses from attendees include:	
Erin Emery-Tiburcio Associate Professor Geriatric and Rehabilitation Psychology, Rush University Medical Center	Bridging traditional silos
Rani Snyder Vice President, Programs, The John A. Hartford Foundation	Greater understanding and connection
Judy Salerno, MD, MS President, NYAM	Improved quality of life for older persons
Nicole Brandt Professor, University of Maryland	Improved care delivery for older adults
Terry Fulmer President, The John A. Hartford Foundation	Better coordination and quality of life for older adults
Mark Kissinger President, K-Forward Consulting	Better care for families
Anne Doyle President, Lasell Village	Living a full, engaged, and purposeful life every day
Susan Reinhard Senior Vice President and Director, AARP Public Policy Institute & Chief Strategist, Center to Champion Nursing in America, AARP	Sharing Innovations

Table 2. *Cont.*

Lindsay Goldman Director, Healthy Aging, New York Academy of Medicine	More efficient use of resources and intellectual capital
Gretchen Alkema VP Policy and Communications, SCAN Foundation	Common Purpose
Anne Pohnert Director of Clinical Quality, CVS Health	Improved/enhanced human experience and equity
Christine O'Kelly Coordinator, Age Friendly University Global Network, Dublin City University	Broaden Participation
Kevin Little, PhD Improvement Advisor, Institute for Healthcare Improvement (IHI)	Greater impact, promote synergies
Melissa Batchelor, Ph.D., RN-BC, FNP-BC, FGSA, FAAN Associate Professor, George Washington University	Multi-sector connections to build the products, support and services need for healthy aging across the lifespan
Leslie Pelton Senior Director, Institute for Healthcare Improvement (IHI)	Older adults who are more engaged and empowered in their communities
Joan Weiss, PhD, RN, CRNP, FAAN Deputy Director, Division of Medicine and Dentistry, Health Resources and Services Administration	Improve healthcare and health outcomes for older adults
Megan Wolfe Senior Policy Development Manager, TFAH	Improved health and well-being for OAs!
Tim Driver President, The Age Friendly Foundation	Improved impact on the quality of experience for older adults
Rachel Roiland, PhD, RN Managing Associate, Duke-Margolis Center for Health Policy	Older adults feel more valued, respected and more connected to society
Terrie (Fox) Wetle Center for Gerontology and Healthcare Research, Brown University School of Public Health	Improved integration of older persons into society and better quality of life for us all
Randel Smith Patient Advocate	Better care for our aging population
Amy Berman Senior Program Officer, The John A. Hartford Foundation	The Age-Friendly Ecosystems initiatives promotes people and organizations working in different Age-Friendly domains to carry messages of the other domains and think how to integrate and accelerate efforts
Rebecca Stoeckle Vice President, Director, Private Sector Partnerships, Education Development Corporation	Systematizing care that is meaningful to older adults. These meetings are the embodiment of continuous communication, ensuring we are aligning goals and methods
Charles (Chuck) Pu Medical Director, Population Health, Mass General Brigham	Meaningful change starts with raising awareness and calling attention to a burning platform in a systematic organized framework

Following this, participants were divided into virtual breakout rooms and worked together to identify the most impactful actions for building an AFE. They were asked to reflect on the following questions: Which goal (in each of the 6 characteristics) do you think is the top priority? Do you agree with the survey results? How can we find the best opportunities to collaborate based upon your priorities? If you had to choose one of the six characteristics of an AFE to explore more deeply through a discussion of goals and measures of impact, which would you choose?

6. Expert Voices Defining an Age-Friendly Ecosystem

The purpose of this endeavor was to seed collective action in the AFE and ask leaders and adherents of each framework to consider a collective approach to improving older adult well-being. Experts conceded that a first, critical step in the process was to identify

commonalities across sectors of work, noting that once they identified commonalities, they would be able to begin to overcome inertia, policy, and payment barriers. However, despite efforts in different sectors and various social-ecological levels, there is a need to expand the analysis across the multiple age-friendly frameworks to determine what they have in common. This group did not try to create a new age-friendly framework. Instead, through a carefully structured process, those representing all age-friendly sectors focused on establishing a set of characteristics that defines the AFE. This was considered a first step in working toward collective impact, followed by goal setting, measurement, and action planning.

Drawing from the social-ecological model [8], experts described how age-friendly characteristics apply to their work and across age-friendly frameworks. This model acknowledged the interplay between older adults' biology and behaviors, their social ties, and their environments. Social-ecological models recognize that individuals are influenced by the people and environments around them, such as social norms, and the environment can be used to target health behaviors (Figure 3) [8,9]. Moreover, social-ecological models also tend to be developmental, asserting that relationships and contexts affect how individuals age.

Figure 3. Social Ecological Model [9].

7. Expert Viewpoints

The sessions resulted in a rich discussion regarding both the value and the challenges of achieving the aim of a shared language and framework. One participant described the work of her institution's integrated community and mobile health service team. Part of their function was to monitor health indicators and social determinants likely to affect health, such as environmental factors that contribute to fall risk and food kept in home pantries. She explained, "The feedback that we are gathering from these visits is [that] there's a lot of support services that [older adults] need." Another participant, based at a large urban teaching hospital, described how she worked at the community and individual levels to promote change. Her hospital was an age-friendly health system that engaged communities and community-based organizations through formal discharge planning. Staff worked with patients to design discharge plans so that when patients left the hospital, they had a written plan that can be implemented or supported by some of the hospitals' affiliated community-based organizations. Two graphics (Figures 4 and 5) presented at the March 2021 convention provide a visual example of the stark difference in older adults' experiences within a non-age-friendly ecosystem and within an age-friendly ecosystem. The graphics used the example of vaccinations to exemplify how AFEs in action can substantially improve older adults' experience when seeking care by making it more seamless, caring, and understanding.

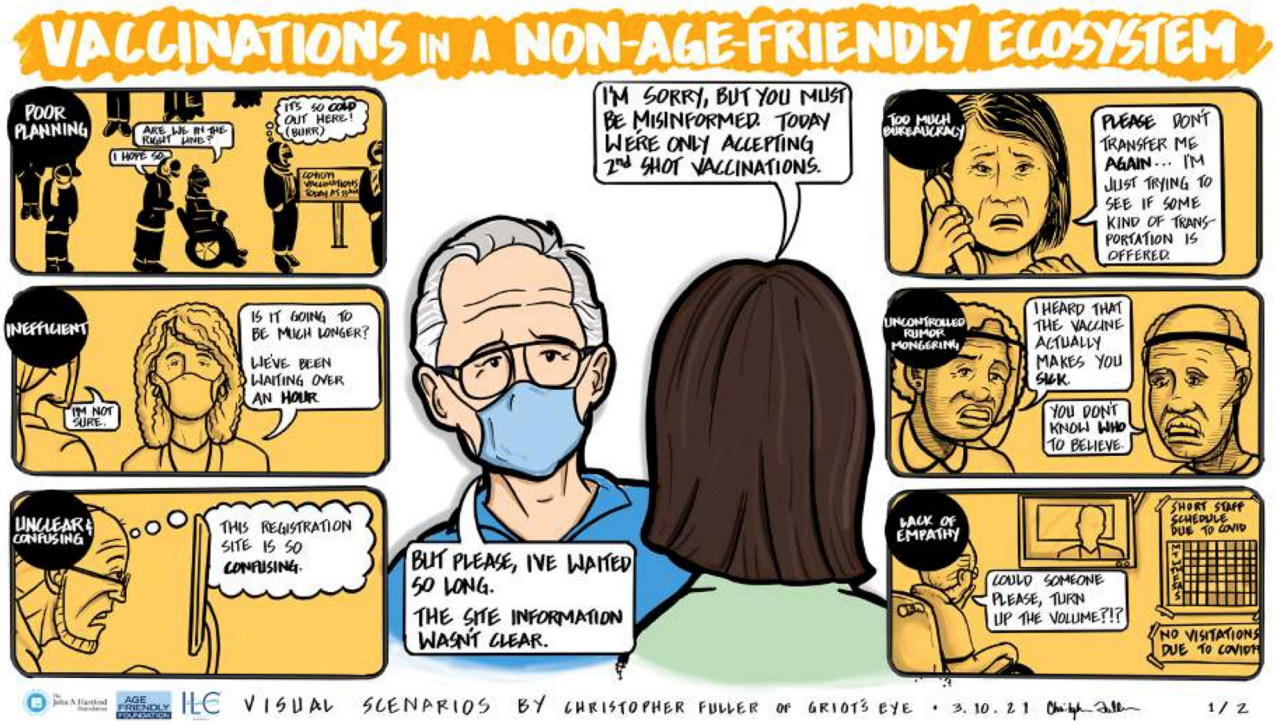


Figure 4. Visual Representation of Vaccine Journey Without a Functioning Age-Friendly Ecosystem.

Figure 5. Visual Representation of Vaccine Journey With a Functioning Age-Friendly Ecosystem.

Experts indicated that it is essential that sectors not only respond to what older adults want and need but also have them plan and develop the services and products they use. One meeting participant described how co-designing programming is responsive to older adults' needs by engaging them in designing materials that promote shared decision-making with

their healthcare providers. This participant indicated that her team co-designed educational materials with focus groups of older adults who provided ample feedback around language and formatting. Her team was discovering that upfront engagement and education were more effective in promoting behavior change among older adults than trying to influence providers to initiate and encourage older adult behavior change. She notes, "If we're engaging older adults [through information sharing and education] . . . we've got an older adult coming in and saying: Hey, doc, I want you to listen to what matters to me, [then] that conversation is much more likely to happen than if we try to tell the docs: Hey, ask your patients what matters to them".

Others emphasize the importance of reaching people at different points in their lives, promoting intergenerational arrangements, and directly addressing ageism. One participant noted that the various age-friendly frameworks inform and enhance each other. She explained, "So what's happening on college campuses is [that we are] teaching college kids how to think and act and basically to be age-less in their mind. Similarly, health care is coming at it from a different direction and employment [from another]. [We're] reaching people at different points in their lives where [we are] calling attention to a bias that shouldn't exist or should be better understood." She went on to say, "In the university sector, one of the reasons [her] university developed this [age-friendly programming] was because we knew we had a perfect opportunity to talk to students about how they are going to age and involve them in aging [research]".

So that age-friendly systems can be better realized, training in essential competencies was also viewed as critical. "If we don't have adequate and accurate knowledge about how best to interact with older patients, older clients, older residents, we can do a lot of damage." Another noted, "we're talking about lifelong learning, helping people to age, but also to have people that will assist them in the health sector." One expert representing an Age-Friendly University (AFU) indicated that training is interdisciplinary and well-integrated into the academic experience with opportunities for real-world practice: "as an academic and a practitioner, we've been aligning our age-friendly university, which is an inter-professional campus, and realizing that we need to have sites for our workforce to develop." At this AFU, gerontology principles are integrated into multiple undergraduate programs and curricula, interdisciplinary graduate-level coursework, and community-based practicums.

8. Summary

Through these conventions, age-friendly leaders were reminded of the importance of a collective impact. According to Kania and Kramer, a collective impact can be described as the commitment of practitioners and stakeholders from different sectors to a common agenda for solving a complex social challenge [10]. As we continue to make progress with our roadmap to an AFE, it is important to maintain the underlying values identified through these discussions. These include bringing in older adults when creating initiatives, empowering them as local champions, considering the diverse needs across groups of older adults, and, most importantly, maintaining respect for all individuals.

In this paper, we provided a narrative from the experts as they considered the opportunities, values, and challenges of implementing a structure that can lead to policies and practice change in how we think about age-friendly ecosystems globally. With the aging of the population and the improved health and well-being for many as they reach their older age, everything we can do to improve our clarity of purpose and continuity of language across the multiple sectors that impact the well-being of older adults will do much to enhance the experience of older age. In the future, as teams collaborate, we will have the experience and data to guide us further into the ecosystem that will inform policy changes and accelerate the coordination that can best serve society. In order to create lasting solutions at scale, they argue, practitioners and stakeholders of all types need to coordinate their efforts and work together around clearly defined goals and a shared vocabulary to describe what it means to be age-friendly, regardless of setting. The involvement of expert

voices in the development of shared language to describe the AFE meaningfully addressed this challenge.

To continue to move this work forward, a coordinating backbone agency with a national footprint would be in a position to foster and manage cross-sector initiatives with the skills and resources to convene, build trust, provide tools, and shepherd meaningful solutions.

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Conflicts of Interest: The authors declare no conflict of interest.

Appendix A. Expert Participants

Zia Agha Chief Medical Officer and Executive Vice President, West Health	Lindsay Goldman Director, Healthy Aging, New York Academy of Medicine	Kari Sederburg Senior Program Officer, Michigan Health Endowment Fund
Gretchen Alkema VP Policy and Communications, SCAN Foundation	Zeea Han Technical Officer, WHO	Caroline Servat Associate Director, Center for the Future of Aging, Milken Institute
John Auerbach President and CEO, Trust for America's Health	Alexandre Kalache President, International Longevity Centre-Brazil	Jody Shue Director of Special Projects, The Age Friendly Foundation
Jane Barratt Secretary General, International Federation on Aging	Mark Kissinger President, K-Forward Consulting	Randel Smith Patient Advocate
Melissa Batchelor, Ph.D., RN-BC, FNP-BC, FGSA, FAAN Associate Professor, George Washington University	Kevin Little, PhD Improvement Advisor, Institute for Healthcare Improvement (IHI)	Rani Snyder Vice President, Programs, The John A. Hartford Foundation
John Beard Professor, The University of New South Wales (UNSW)	Kedar Mate, MD President and CEO, Institute for Healthcare Improvement (IHI)	Rebecca Stoeckle Vice President, Director, Private Sector Partnerships, Education Development Corporation
Amy Berman Senior Program Officer, The John A. Hartford Foundation	Joseph C. McCarron, Jr., CPA Principal & Founder, Capital Care Associates, LLC	Nora Super Senior Director, Center for the Future of Aging, Milken Institute
Alice Bonner Senior Advisor for Aging, Institute for Healthcare Improvement and Adjunct Faculty, Johns Hopkins University School of Nursing Institute for Healthcare Improvement (IHI)	Stefanie Mozgai State of NJ Department of Health	Dr. Bill Thomas Geriatrician and Founder of The Eden Alternative
Nicole Brandt Professor, University of Maryland	Adriana Nava Chief of Quality and Systems Improvement, Edward Hines Jr., VA Medical Center	Diane Ty Director of the Alliance to Improve Dementia Care, Center for the Future of Aging, Milken Institute
Bill Coleman Executive Vice President, PayFactors	Christine O'Kelly Coordinator, Age Friendly University Global Network, Dublin City University	Donna Walsh Health Officer for the Florida Department of Health in Seminole County, Seminole County
Kim Dash Senior Research Scientist, Education Development Corporation	Kathleen Otte Regional Administrator, Administration for Community Living (ACL)	Joan Weiss, PhD, RN, CRNP, FAAN Deputy Director, Division of Medicine and Dentistry, Health Resources and Services Administration
Michelle Dionne-Vahalik Associate Commissioner, Texas Health and Human Services Commission	Leslie Pelton Senior Director, Institute for Healthcare Improvement (IHI)	Terrie Wetle Center for Gerontology and Healthcare Research, Brown University School of Public Health
Anne Doyle President, Lasell Village	Anne Pohnert Director of Clinical Quality, CVS Health	Debra Whitman EVP and Chief Public Policy Officer, AARP
Tim Driver President, The Age Friendly Foundation	Charles Pu Medical Director, Population Health, Mass General Brigham	Megan Wolfe Senior Policy Development Manager, TFAH
Erin Emery-Tiburcio Associate Professor Geriatric and Rehabilitation Psychology, Rush University Medical Center	Gloria Ramsey Associate Dean, Diversity, Equity and Inclusion at Johns Hopkins School of Nursing	Dr. Rodrigo Bornhausen Demarch Chief Innovation Officer, Sociedade Beneficente Israelita Brasileira Albert Einstein
Shekinah Fashaw PhD Candidate, Department of Health Services Policy & Practice, Brown University School of Public Health	Susan Reinhard Senior Vice President and Director, AARP Public Policy Institute & Chief Strategist, Center to Champion Nursing in America, AARP	Dr. Phyllis D. Meadows Senior Health Fellow, The Kresge Foundation
Terry Fulmer President, The John A. Hartford Foundation	Rachel Roiland, PhD, RN Managing Associate, Duke-Margolis Center for Health Policy	Dr. John W. Rowe Julius B. Richmond Professor of Health Policy and Aging, Columbia University Mailman School of Public Health
Suzanne Garon Director, WHO Collaborating Centre for Age-friendly Cities and Communities, University of Sherbrooke	Judy Salerno, MD, MS President, NYAM	Dr. Naa Adorkor Sodzi-Tettey Immediate Past President of the Medical Women Association of Ghana
Robyn Golden Associate Vice President of Social Work and Community Health, Rush University Medical Center	Ana Scuteri Community and Population Health Director, Florida DOH in Seminole County, Seminole County	Dr. Nancy Whitelaw Expert Advisor to the Hartford Change Agents Initiative, Gerontological Society of America, Consultant and Senior Leader to the Practice Change Leaders for Aging and Health Program

Appendix B. Characteristics and Supporting Practices of Age-Friendly Ecosystems

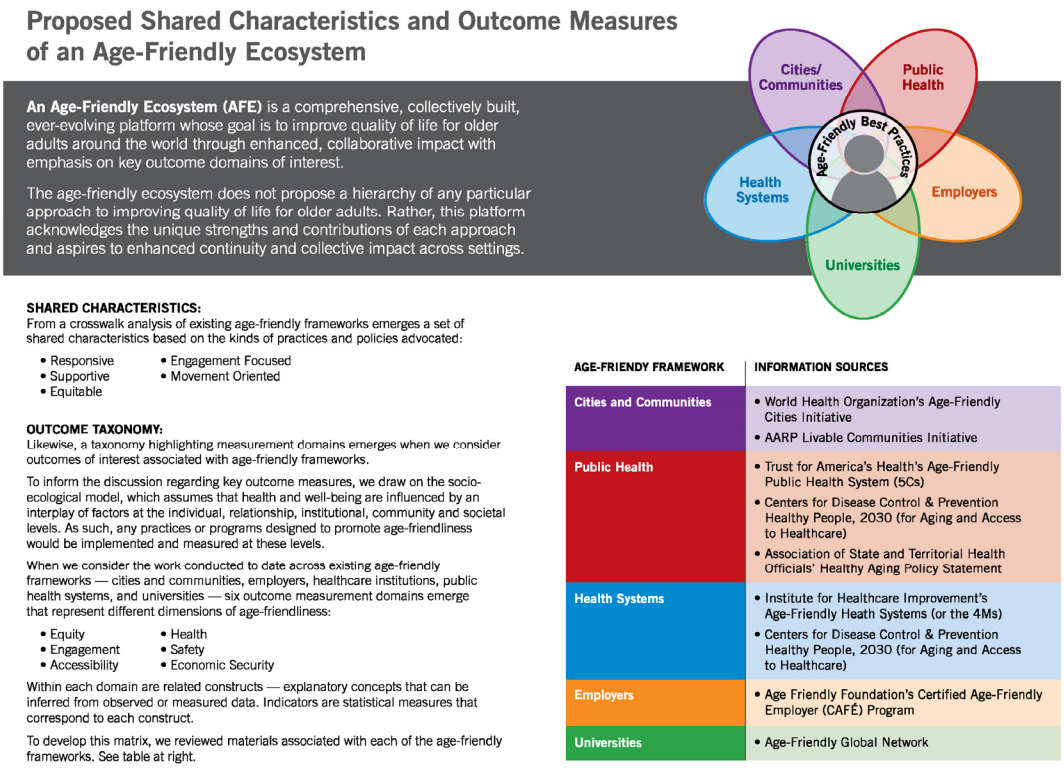

Figure A1. Proposed Shared Characteristics and Outcome Measures of an Age-Friendly Ecosystem.

Shared Characteristics of Age-Friendly Frameworks

	RESPONSIVE	SUPPORTIVE	EQUITABLE	ENGAGEMENT FOCUSED	MOVEMENT ORIENTED
Public Health Systems (5Cs)	Collecting and disseminationg data to identify priorities for and programming needs of older adults	Coordinating existing supports and services (emergency preparedness); Communicating to increase awareness of health-related services and programs	Collecting and disseminating data to identify and address inequities by age and among subgroups of older adults	Connecting and convening multiple sectors/professions, fostering collaboration, coordinating existing supports and services	Complementing and supplementing existing transportation and environmental supports and services
Health Systems (4Ms)	Knowing and aligning care with "what matters" to the older adult	Using medication that does not interfere with what matters, mentation or mobility; Prevent, identify, treat, and manage delirium across settings of care	Ensuring older adults of different incomes, races and ethnicities and sexual orientation have equitable access to care	Engaging older adults (and caregivers) in shared decision making about care	Ensuring that older adults can move safely to maintain function and do what matters
Communities/ Cities/States (8 Domains)	Implementing inititatives that address the concerns of the older adults in community	Focusing policies and practices on health services and community supports tailored for older adults	Enacting policies that promote equal access to housing, outdoor spaces & buildings, communication and information as well as promote social inclusion	Implementing programs that promote social participation, civic participation and employment	Developing and implementing transportation solutions that promote mobility and access to critical services and cultural activities
Employers (Best Practices)	Developing responsive work schedules and flexible arrangements with input from older employees	Showcasing general commitment and workforce policies to support older adults	Providing job content and process accomodations; Offering training and professional development opportunities	Demonstrating a commitment to workforce planning and composition, employee retention, and candidate recruiting	Providing accomodations that promote workforce participation and mobility in the work environment
Universities/ Education Systems (Principles)	Ensuring that research agenda is informed by the needs of an aging society and promoting public discourse; Recognizing diverse educational needs of older adults	Enhancing access for older adults to university health and wellness programs	Widening access to online educational opportunities; Increasing student understanding of the longevity dividend and the increasing complexity and richness that aging brings to our society; Promoting personal and career development	Promote intergenerational learning; Engage actively with the university's own retired community; Ensure regular dialogue with organizations representing the interests of the aging population	Enhancing access for older adults to university cultural and arts resources and events

Figure A2. Shared Characteristics of Age-Friendly Frameworks.

Social-Ecological Unit of Influence and Practice							Age-Friendly Frameworks				
Individual	Relationship	Institution	Community	Society	Outcomes	Indicators	Public Health	Health Systems	Cities/ Communities	Employers	Universities
					DOMAIN: EQUITY						
		✓	✓	✓	**Equal opportunity**	Income inequality index score	●		●	●	
		✓			**Workplace equity**	Age bias claim history				●	
		✓				Worker views on issues of age bias and 50+ worker inclusion (self-report)				●	
		✓	✓	✓	**Multi-generational workforce**	Proportion of workforce aged 50+ (compared to other age groups)			●	●	●
		✓	✓	✓		Age diversity index score			●	●	●
		✓	✓		**Multi-generational learning**	Proportion of college/university enrolled students who are age 50+ years				●	●
✓	✓	✓			**Professional development for older workers**	Number of trainings/professional development activities provided per total number of employees				●	
		✓	✓	✓		Proportion of age 50+ workforce participating in educational, training, or professional development activities				●	●
		✓			**Economic opportunity**	Workplace pay rates by position/grade and age group				●	
			✓	✓		Jobs per worker/person			●	●	
	✓	✓			**Retention & recruitment of older workers**	Rate and timing of retirements				●	
	✓	✓				Retention rates of older workers compared to younger colleagues				●	
✓	✓	✓				Proportion of older adults interviewing for jobs advertised				●	
	✓	✓				Proportion of new hires who are 50+				●	
	✓	✓				Prospective employee rating of interview process				●	
	✓	✓				Retention rates of older workers compared to younger colleagues				●	
	✓	✓				Job satisfaction (self report)				●	
			✓		**Affordable housing**	Proportion of older people who live in a household that spends less than 30 per cent of their equalized disposable income on housing.	●		●		
			✓			Average housing costs per month	●		●		
			✓			Number of subsidized housing units per 10,000 people	●		●		
			✓		**Housing options**	Proportion of housing that is multi-family	●		●		
			✓			Proportion of older adults who are community-dwelling (i.e., living independently)	●		●		
			✓		**Neighborhood quality**	Vacancy rate	●		●		
		✓	✓	✓	**Data equity** (5C-Improved surveillance of older adult health issues; Universities-improved assessment of older adult learning issues)	Older adult items added to BRFSS (as well as to other major national and local surveys and needs assessments)	●				●
		✓				University research agendas focuses on aging issues					●
✓	✓	✓	✓	✓	**Positive social attitude toward aging & older adults**	Rates of psychological, physical, financial, and neglectful elder mistreatment (there are other positive indicators)	●	●	●	●	●
					DOMAIN: ENGAGEMENT						
✓	✓	✓	✓		**Social engagement - volunteering**	Proportion of older people in local volunteer registries.	●		●		
✓	✓	✓	✓	✓	**Social Engagement - working**	Labor force participation rates for individuals aged 60+			●	●	
✓	✓	✓	✓		**Social engagement - socio-cultural activity**	Proportion of older adults among all reported visitors to local cultural facilities and events.	●		●		●
✓	✓	✓	✓		**Social engagement - leisure-time physical group activities**	Proportion of older people who are a member of a self-organized or institutionalized leisure-time physical activity group	●		●		
✓	✓	✓			**Social engagement - university activities**	Proportion of older adults participating in all core activities of the university			●		●
✓	✓	✓	✓		**Social engagement - general**	Social involvement index score	●		●		
✓	✓	✓	✓			Number of cultural, arts, and entertainment institutions per 10,000 people	●		●		●
✓	✓		✓	✓	**Civic engagement**	Proportion of eligible older voters who actually voted in the most recent local election or legislative initiative.	●		●		
		✓	✓			Number of civic organizations per 10,000 people	●		●		
✓	✓		✓	✓		Voting rate/proportion of people who voted	●		●		
		✓	✓		**Availability of information** (5C-Conducting, communicating, and disseminating research findings and best practices to support healthy aging)	Availability of local sources providing information about health concerns and service referrals, including by phone.	●	●	●		
✓			✓			Proportion of older people living in a household with internet access at home.	●		●		●
		✓	✓			Proportion of residents that have high-speed, low-cost service	●		●		●
✓	✓	✓			**Lifelong learning engagement**	Proportion of older people who were enrolled in education or training, either formal or non-formal, in the past year.	●		●	●	●
		✓				Proportion of college/university courses that are offered online				●	●
✓	✓	✓				Proportion of university students aged 50+ participating in online learning				●	●
✓	✓	✓				Proportion of university's retired alumni participating in university-related activities					●
✓	✓	✓			**Healthcare decision-making**	Proportion of patients satisfied with care	●	●	●		
✓	✓	✓				Survey of care concordance with patient goals/care decisions		●			
✓	✓	✓				Consumer Assessment of Healthcare Providers and Systems (CAHPS)		●			
✓	✓	✓				Proportion of older adults whose health care provider checked their understanding	●	●			
✓	✓	✓				Proportion of older adults who report poor communication with their health care provider	●	●			
✓	✓	✓				Proportion of older adults who have been involved in healthcare decisions as much as they wanted to be	●	●			
✓		✓	✓	✓	**Labor force engagement**	Proportion of older adults in the labor force	●		●	●	●
	✓	✓	✓		**Cross-sector engagement**	Network size, composition, cohesion, strength, centrality, activities, and structural holes based on reports of sector representatives	●		●		●
					DOMAIN: ACCESSIBILITY						
		✓	✓		**Mobility**	Proportion of new and existing public spaces and buildings that are fully accessible by wheelchair.	●		●		●
			✓		**Walkability**	Proportion of streets in the neighborhood that have pedestrian paths which meet locally accepted standards	●		●		
			✓		**Accessible housing**	Proportion of new and existing houses that have wheelchair-accessible entrances (i.e. sufficient width, ramp).	●		●		
			✓			Proportion of housing with zero-step entrances.	●		●		
			✓		**Accessible transportation**	Proportion of priority parking spaces at new and existing public facilities that are designated for older people or people with disabilities.	●		●		

Figure A3. *Cont.*

			✓			Proportion of public transport vehicles with designated places for older people or people who have disabilities	●		●		
			✓			Proportion of stations that are ADA accessible	●		●		
			✓			Proportion of housing within walking distance (500 m) to a public transportation stop.	●		●		
			✓			Number of buses and trains per hour	●		●		
✓			✓			Average number of trips per household per day	●		●		
✓			✓			Average number of hours per person per year spent on transportation	●		●		
✓			✓			Average transportation costs per household per year	●		●		
✓	✓	✓			**Health and social services availability** (SC-Coordinating existing supports and services to increase access to services and supports)	Proportion of older persons who have personal care or assistance needs that are receiving formal (public or private) home- or community-based services.	●	●	●		
			✓	✓		Healthcare professional shortage index score	●		●		
✓	✓	✓				Proportion of older adults using university health and wellness services	●				●
		✓	✓		**Health care access**	Proportion of ED visits with longer wait time than recommended	●	●			
		✓	✓			Proportion of older adults who can't get care when they need it	●				
✓	✓	✓	✓			Proportion of older adults with a primary care provider	●	●			
		✓	✓			Number of geriatricians per older adult population	●				
		✓				Proportion of older adults offered online access to their medical records	●	●			
		✓	✓	✓		Proportion of health care providers who do not see Medicare-insured patients	●				
		✓	✓	✓		Proportion of health care providers who do not see Medicaid-insured patients	●				
✓	✓	✓	✓			Preventable hospitalizations per 1000	●	●	●		
✓	✓	✓	✓			Rate of ED visits among older adults	●	●			
			✓		**Diversity of destinations**	Diversity of destinations index from 0 – 1	●		●		
			✓	✓	**Access to jobs**	Number of jobs per capita by geographic area	●		●	●	
			✓			Proportion of jobs located near transit stops	●		●	●	
			✓	✓	**Compact neighborhoods**	Number of jobs and people per square mile	●		●	●	
			✓		**Access to libraries**	Number of libraries per capita by geographic area	●		●		
			✓		**Access to parks**	Number of parks per capita by geographic area	●		●		
			✓		**Access to groceries**	Number of stores per capita by geographic area	●		●		
					Informal Caregiving	Proportion of adult family members or other informal caregivers age 18 and older providing care to individuals aged 65+					
						Proportion of older adults living with their children					
						Proportion of informal caregivers of older adults provided respite care services					
✓	✓	✓	✓		**Mobility (4M)**	Proportion of older adults with physical or cognitive health problems who get physical activity	●	●			
					DOMAIN: SAFETY						
	✓	✓	✓		**Home safety**	Number of reported cases of mistreatment of older persons (as a proportion of the total number of older people).	●	●	●		
			✓		**Neighborhood safety**	Reported rate of crimes (per year) committed against older people	●		●		
		✓	✓		**Emergency preparedness and response that addresses needs of older adults** (SC - Cross-sector coordination to strengthen emergency preparedness to address the needs of vulnerable older adults)	Proportion of employees of local government agencies, community organizations, and service providers who participated in an emergency response training or drill in the past year which addressed the needs of older residents.	●		●		●
			✓	✓	**Transportation safety**	Average speed limit	●		●		
			✓			Fatal crashes per year per 100,000 people	●		●		
			✓	✓	**Environmental protections**	Proportion of people exposed to water quality violations	●		●		
			✓	✓		Number of unhealthy air quality days per year	●		●		
			✓			Number of people exposed to near-roadway pollution	●		●		
		✓	✓	✓		Local industrial pollution index	●		●		
					DOMAIN: HEALTH (& WELL BEING??)						
✓	✓	✓	✓	✓	**Healthy behaviors**	Proportion of people who smoke regularly	●	●	●		
✓	✓	✓	✓	✓		Proportion of people who are obese	●	●	●		
✓	✓	✓			**Neglect**	Rate of pressure ulcer-related hospital admissions among older adults	●	●			
✓		✓			**Healthcare utilization**	30-day all cause readmission rate for older adults		●			
✓		✓				Average length of stay		●			
✓	✓	✓	✓		**Mentation (4M) or brain health**	Proportion of older adults with physical or cognitive health problems who get physical activity	●	●			
✓	✓	✓				Rate of hospital admissions for diabetes among older adults	●	●			
✓	✓	✓				Proportion of older adults or their caregivers who know that they have dementia	●	●			
✓	✓	✓				Proportion of adults with subjective cognitive decline who have discussed their symptoms with a provider	●	●			
✓	✓	✓				Proportion of preventable hospitalizations in older adults with dementia	●	●			
✓	✓	✓			**Social & behavioral health**	Substance misuse rates among older adults	●				
✓	✓	✓				Depression rates among older adults	●				
✓	✓	✓			**Infectious disease prevention**	Rate of hospitalization due to urinary tract infections among older adults	●	●			
✓	✓	✓			**Injury prevention (mobility)**	Rate of fall-related deaths among older adults	●	●			
✓	✓	✓				Rate of ED visits due to falls among older adults	●	●			
✓		✓				Rate of hip fractures among older adults	●	●			
✓	✓	✓			**Medication management (4M)**	Proportion of older adults who use inappropriate medications	●	●			
✓		✓			**Food borne illness**	Incidence of laboratory-diagnosed, domestically-acquired *Listeria monocytogenes* infections	●				
✓		✓			**Oral health**	Proportion of older adults with untreated root surface decay	●				
✓		✓				Proportion of older adults who have lost all their teeth	●				
✓		✓				Proportion of older adults with moderate to severe periodontitis	●				

Figure A3. *Cont.*

✓		✓	✓	✓	**Respiratory disease prevention**	Rate of hospital admissions for pneumonia among older adults	●	●			
✓		✓	✓			Rate of hospital admissions for asthma among older adults	●	●			
✓		✓			**Sensory disorder prevention**	Rate of vision loss from age-related macular degeneration	●	●			
					DOMAIN: ECONOMIC SECURITY						
✓	✓			✓	**Disposable income**	Proportion of older people living in a household with a disposable income above the risk-of-poverty threshold.	●		●	●	
✓		✓			**Savings**	Average amount of savings at age of retirement or for individuals aged 65 years	●		●	●	

Figure A3. Social-Ecological Unit of Influence and Practice of Age-Friendly Frameworks.

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