

Measuring the Age-friendliness of Cities: A Guide to Using Core Indicators



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Table of Contents

I.	Introduction	5
A.	Age-friendly City initiatives: a response to the converging trends of ageing and urbanization.....	5
B.	The role of a common framework and indicators in promoting age-friendliness of cities	6
II.	Objectives.....	7
III.	Development process	7
IV.	A framework for defining a local Age-Friendly City indicator set and measurement strategy.....	8
A.	Using the framework	10
1.	Input indicators	10
2.	Output indicators	11
3.	Outcome indicators.....	11
4.	Impact indicators	12
5.	Equity indicators	13
B.	Additional considerations for selecting indicators	13
V.	Core indicators	14
A.	Core Indicators: Operational Definitions	15
VI.	Supplementary indicators	30
VII.	Limitations of the framework and indicators.....	34
VIII.	References.....	35
IX.	Annex 1: Indicator guide development process	37
X.	Annex 2: Examples of locally developed indicator sets	40
A.	Canada Mortgage and Housing Corporation: community indicators for an aging population	40
B.	The AdvantAge Initiative: 33 Indicators to measure age-friendliness in communities	43
C.	Livable community indicators for sustainable ageing in place	45
XI.	Annex 3: Annotated bibliography of selected research publications on the methodological aspects of measuring age-friendliness.....	49

List of Figures

Figure 1. A framework for selecting an Age-friendly City indicator set.....	9
Figure 2. Core indicators of Age-friendly Cities	15
Figure 3. Development process of Age-friendly City indicator framework and core indicators	38

Acknowledgments

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I. Introduction

A. Age-friendly City initiatives: a response to the converging trends of ageing and urbanization

The world's population is currently undergoing two historically significant demographic shifts – rapid ageing and urbanization. As a result, the number of older people living in urban environments is growing dramatically.

In most countries, the fastest growing age group is 60 and older. The number of people in this age group is expected to increase from 841 million in 2013 to more than 2 billion in 2050, representing an almost doubling of the proportion of this population worldwide from 11.7 percent in 2013 to 21.1 percent in 2050 (UNDESA, 2013). Older populations are also growing faster in less developed countries and regions of the world than in more developed regions. Remarkably, by 2047, the number of people aged 60 and over is expected to exceed the number of children under the age of 15, globally, for the first time in history (UNDESA, 2013).

Urban populations are also steadily increasing around the globe, and in much greater number in less developed parts of the world. In 2007, more than half of the world's population lived in urban areas (UNDESA, 2010). This is expected to increase to 70 percent by 2050 (Beard & Petitot, 2010). Every year, the number of urban dwellers is increasing by almost 60 million (WHO & UN-Habitat, 2010). And, by 2050, the urban population will have nearly doubled in size since 2009, from 3.4 billion to 6.3 billion (UNDESA, 2010). The majority of this urban population growth over the next 30 years will occur in the developing world.

As these two major demographic shifts continue to affect many parts of the world, ageing and health in urban settings are increasingly becoming a priority issue in both developed and developing countries. The challenges and opportunities that come with urbanization (WHO & UN-Habitat, 2010) and with population ageing (WHO & U.S. National Institute of Aging, 2011), respectively, have been well recognized; the impacts of their convergence, however, are only beginning to be understood.

In response to population ageing and the rise of noncommunicable diseases, health services are increasingly being reoriented to enhance health promotion, prevention of disease, disability and frailty, management of co-morbidities and provision of long-term care, while reducing unnecessary institutionalization. Going beyond the health sector, aspects of the natural and built environment, social services and programmes, cultural attitudes, social capital, equity and inclusion, all influence the degree to which older people can function and participate in society.

Older residents require a number of supportive living conditions to respond to the physical, mental and social changes they experience as a result of biological ageing. These may be especially lacking in urban environments which, in general, are not designed to be residential centres for a population of primarily older people. While this guide is chiefly oriented towards urban environments, it is also important to highlight the importance of age-friendly rural environments (Public Health Agency of Canada, 2009). In either setting, addressing both the social and physical aspects of the community

environment is essential in order to respond well to the needs and preferences of older adults to promote their health and wellbeing.

An “age-friendly city” is an inclusive and accessible community environment that optimizes opportunities for health, participation and security, in order that quality of life and dignity are ensured as people age. More specifically, in an age-friendly city, policies, services, settings and structures support and enable people to age well by:

- recognizing the wide range of capacities and resources among older people;
- anticipating and responding flexibly to ageing-related needs and preferences;
- respecting older people’s decisions and lifestyle choices;
- protecting those who are most vulnerable; and
- promoting older people’s inclusion in, and contribution to, all areas of community life (WHO, 2007a).

Readers are strongly encouraged to read the Global Age-friendly City Guide (WHO, 2007a) developed by the World Health Organization (WHO) in order to fully understand the age-friendly concept. A checklist of essential features of age-friendly cities (WHO, 2007b) is also available to support the development of health and social policies, services and interventions to create age-friendly environments. The guide was based on the perspectives and inputs of older people, care givers and service providers collected in 33 cities across all six WHO regions: Africa, Americas, Eastern Mediterranean, Europe, South East Asia and Western Pacific. The guide focuses on eight key domains of urban life that encompass determinants of health and wellbeing: outdoor spaces and buildings, transportation, housing, respect and social inclusion, civic participation and employment, social participation, community and health services, and communication and information.

In order to assist cities to become more age-friendly and to facilitate mutual learning and support, the WHO established the Global Network of Age-friendly Cities and Communities (GNAFCC) in 2010. The GNAFCC connects cities and communities which share a commitment to become more age-friendly. The network’s objective is to facilitate the exchange of information and best practices, provide technical support and training, and help cities ensure that interventions are appropriate, sustainable and cost effective. The cities and communities participating in the network are committed to continuously assess and improve their age-friendliness, and to adapt their structures, policies, settings and services to be accessible to, and inclusive of, older people with different needs and capacities.

B. The role of a common framework and indicators in promoting age-friendliness of cities

Frameworks and indicators can be instrumental in establishing a common understanding among stakeholders about the key dimensions of age-friendliness that are valued in their city, and set goals and objectives in relation to them. The indicators can be used to measure the baseline level of age-friendliness of the city and monitor how it changes over time as relevant interventions are implemented. Monitoring and evaluation are hallmarks of sound public health practice. As such, indicators should be an integral part of an outcomes-oriented accountability system for age-friendly city initiatives. The indicators can also be leveraged to foster political and social commitment, which,

in turn, can lead to further actions to promote and sustain age-friendly cities (Davis & Kingsbury, 2011).

II. Objectives

This guide sets forth a **framework** and a set of **core and supplementary indicators** to inform the selection of a local indicator set to monitor and evaluate progress in improving the age-friendliness of urban environments. The guide also includes references and additional resources, such as examples of local initiatives to develop indicators for measuring the age-friendliness of communities.

The objectives of this Guide are:

- **To provide structured guidance on selecting indicators of the age-friendliness of a city.**
- **To present a set of indicators which are suggested for use in measuring the age-friendliness of a city.**
- **To support local efforts to develop relevant and appropriate indicators of the age-friendliness of a city.**

Using the same structured approach to selecting indicators, including the adoption of a core set of indicators, will facilitate comparisons across time and place. At the same time, the flexibility of this guide allows the selection of indicators to be adapted to the local context (e.g. sociocultural context, level of resources, needs and priorities, specific goals and interventions adopted by the city) in order to enhance the utility of this guide and to encourage local innovation.

This guide and the indicators presented within are **not** meant to supersede other similar guidance and indicators that have been developed locally or nationally by government or non-government bodies. This is a form of technical guidance offered by WHO as a service to local and municipal governments and community groups who are seeking direction on this topic and who may be interested in improving the global comparability of their indicators.

The guide is intended for any interested city or community, including members of the WHO Global Network of Age-friendly Cities and Communities; participants of Healthy Cities initiatives; and others engaged in developing programmes for healthy ageing or otherwise using age-friendliness indicators for planning, monitoring and evaluation.

III. Development process

The indicator framework and indicators presented in this guide are the product of a structured approach carried out between 2012 and 2014. This involved literature reviews, two expert consultation meetings, several rounds of peer review, and a pilot study which generated inputs from over 40 cities across 15 countries. The detailed description of the development process is in Annex 1.

IV. A framework for defining a local Age-Friendly City indicator set and measurement strategy

Figure 1 presents a general framework which shows how certain resources and structures (the *inputs*) enable interventions in the form of policies, services and programmes (the *outputs*) that help improve the age-friendliness of the physical and social environment (the *outcomes*), which, in turn, contribute to improving the health and wellbeing of older residents and of the population as a whole (the *impact*). It also places equity at the core, as a cross-cutting principle, to highlight the importance of ensuring equity in the distribution of inputs, outputs, outcomes and impact.

It is important to remind readers that the short- to medium-term focus of age-friendly city interventions and, thus, of measurement is on changing features of the social and physical environment as important determinants of health. In the longer term, impact on health and wellbeing is intended and expected through multiple, indirect pathways. There are, of course, many additional opportunities for influencing specific health outcomes in a more direct and immediate way through individual interventions for health promotion, disease prevention, early detection and treatment, rehabilitation, palliative care, etc. However, an age-friendly city is a community-wide, rather than individually-based, effort which takes a broader perspective of older persons' wellbeing.

The framework is grounded in the scientific literature and also reflects inputs received through expert consultations. While it does not posit specific causal associations, the model considers the logical interrelations among the key domains of urban life, the human ageing process, and the physical and social environment as determinants of health and wellbeing. It also recognizes that these are systemic, not isolated, issues which require a multisectoral response, or the cooperation of government, private and civil society organizations from all fields, as well as individual community members, to solve problems that affect the whole community. This model provides the general framework for identifying the different types of indicators that should be considered when developing a strategy for the overall assessment and monitoring of the age-friendliness of a city.

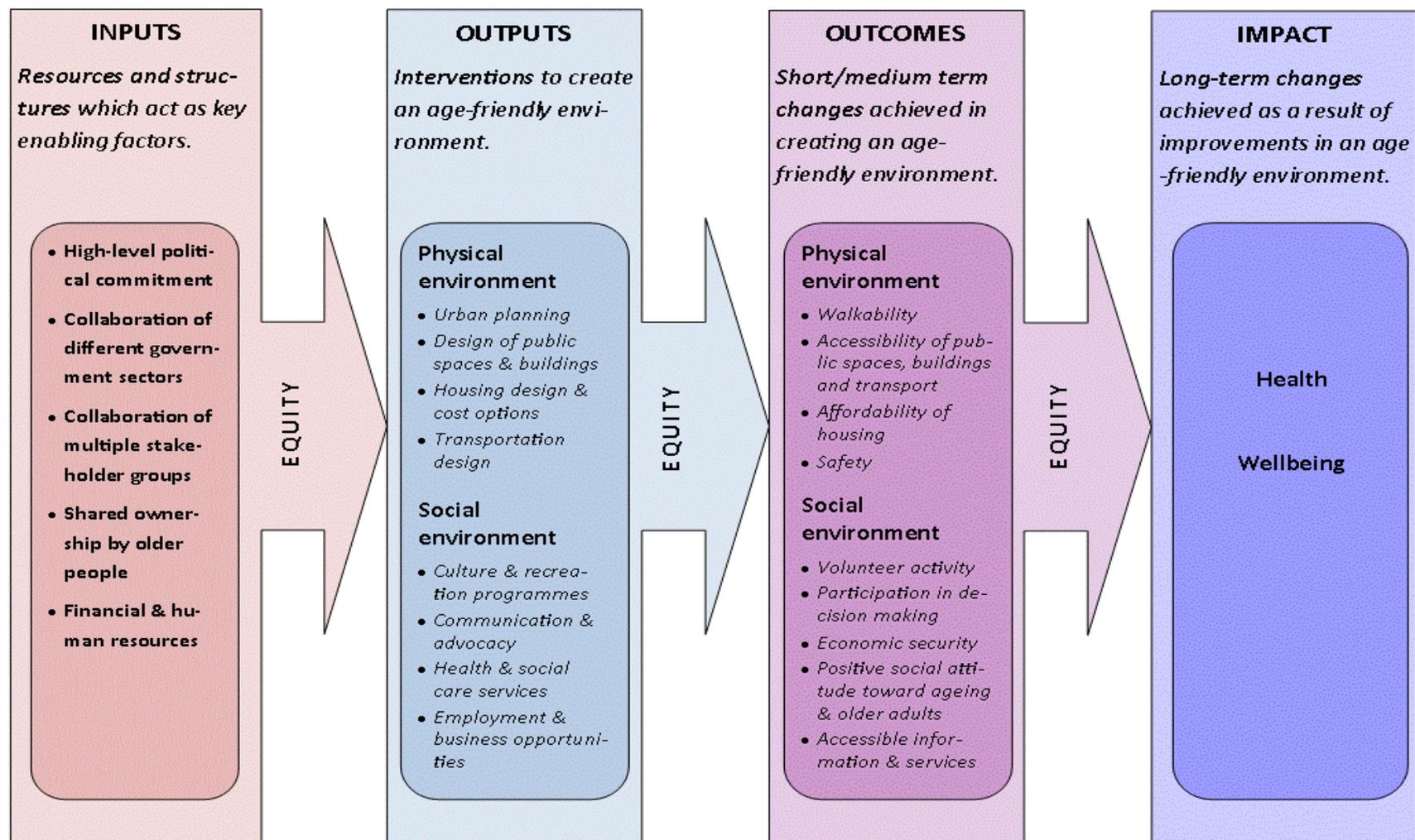


Figure 1. A framework for selecting an Age-friendly City indicator set

A. Using the framework

The framework gives an overview of the different phases and dimensions of a coordinated effort to improve the age-friendliness of a city, and eventually to improve the health and wellbeing of an ageing urban population. Many strategic approaches are possible for selecting an indicator set. If the aim is to understand the intricate dynamics of this complex phenomenon in detail, all of the aspects depicted in the framework could potentially be measured using a large compendium of indicators. If, on the other hand, the aim is to focus on certain dimensions of the framework (e.g. the use of a specific resource, the implementation and outcome of a specific intervention, etc.), multiple indicators focusing on that particular aspect may be selected to the exclusion of those relevant to other dimensions. Yet another approach would be to select a few indicators that cut across the whole framework vertically, horizontally, or both, to obtain a comprehensive yet succinct set of measures. Other variations of these approaches are possible, as well.

Indicators are, by definition, succinct measures which describe a complex phenomenon, typically produced by processing and simplifying a large amount of raw data. A few good indicators should be able to provide a fairly comprehensive picture without unnecessary detail. In general, a well-crafted, parsimonious indicator set is often preferred in practice because it has the advantage of efficiency and of focusing attention. This is especially the case when the purpose of the indicators is to obtain an overview of a situation and to set strategic directions by key decision-makers or by multistakeholder, multisectoral groups.

This guide is thus geared toward developing such a **core indicator** set, a relatively small indicator set which responds well to the main objectives of a local age-friendly city initiative. This limited indicator set can provide a snapshot of the age-friendliness of a city and inform broad strategic directions for the city. The framework can help guide the selection of indicators to be included in the core set. While the focus of this guide is on developing a core set of indicators for a summative assessment of the age-friendliness of a city, it can also inform the construction of additional supplementary indicator sets to monitor activities at lower levels of decision-making or implementation.

The following sections describe each dimension of the framework, examples of relevant indicators, and important considerations for including those indicators in a local indicator set. While the categories of indicators are presented in the order of moving from left to right in the framework, as depicted in Figure 1, following the logical flow of the diagram, it is often helpful to select indicators in reverse order – to start by identifying indicators that correspond to the key expected impacts and outcomes of the initiative, then working backward to identify output and input indicators that are most relevant.

1. Input indicators

Inputs are the **resources and structures which are essential to the successful initiation, development and sustainability of age-friendly city initiatives**. Indicators of inputs could be useful, for example, in tracking the availability, allocation and use of resources over time. Input indicators can generate data that could be used for cost-effectiveness analysis. They could also be used to advocate for greater engagement and contributions from stakeholders.

Input indicators may be measured in terms of availability (a binary, yes-no indicator) or the *level of* availability (on an appropriate scale). For example, the presence of a letter of commitment signed by the city's mayor can be used as a binary, qualitative indicator of high-level political commitment; in another case, the amount of financial commitment (in absolute or relative terms) by the mayor's office can be used as a quantitative indicator of both the level of political commitment and the level of financial resources. When considering the inclusion of input indicators in a limited set of age-friendly city indicators, preference should be given to those that are related to inputs which would have a broad influence on a range of outputs (such as political commitment) over those that represent inputs which, by design, are meant to have only limited influence (such as financial resources for one intervention out of many).

2. Output indicators

Outputs primarily refer to the interventions that are implemented in order to achieve the desired outcomes and impacts. In the present context, **the focus of interventions is on creating age-friendly environments**, and these interventions can take the form of policies, services or programmes designed to change the physical and social environment. These are not restricted to newly implemented interventions but can also involve modifications to existing interventions. While the lead agency or coordinating body of an age-friendly city initiative may be the local government, it is important to recognize that non-government sectors, including civil society and the private sector, play a key role, often to fill in gaps in government interventions or to bolster those interventions.

Output indicators should capture the range of activities across the various sectors with particular attention to their scope and magnitude. An example of this would be the number (or proportion) of public transportation facilities (e.g. bus stops/stations, rail stations) in new construction or alterations that comply with relevant accessibility (e.g. inclusive design) standards. The agency or sector that is directly responsible for the implementation of the intervention might measure a wide range of indicators to closely monitor and evaluate both the process and outcome of their intervention. However, for the purposes of developing a concise indicator set for the overall assessment of a multi-faceted, city-wide age-friendly initiative, it is advisable to restrict the output indicators to those related to key interventions of high priority, or of collective interest, to the city and its stakeholders.

3. Outcome indicators

The core objectives of age-friendly city initiatives are typically related to this level of outcomes, which are the **short- to medium-term changes realized in the social and physical domains of the community environment** that are attributable (by logical or statistical association) to preceding interventions. In the context of age-friendliness of cities, the outcome indicators will mainly be related to issues of accessibility and inclusiveness of the key facets of urban life, such as physical accessibility of public facilities (e.g. health and social services, transportation, recreation facilities), affordability of decent housing, opportunities for social engagement, and accessibility of information. To use a previous example, increasing the number of public transportation facilities that comply with accessibility standards (the intervention, or output) is expected to improve "accessibility of public transportation" (an outcome).

Outcomes for the community as a whole, and not just for the older adults, are also important to consider, especially to highlight the positive contributions of older persons and the benefits of an

age-friendly city to the wider community. Examples include donations, volunteering, and mentoring by older persons, as well as general connectivity of transport systems, and perceived accessibility of public facilities among people with disabilities, pregnant women, and families with small children.

The outcome indicators to be included in an indicator set should take into consideration the basic tenet that an age-friendly city encompasses a wide range of physical and social environmental factors that cut across the sectors of government and society. Thus, an indicator set should include a range of outcome indicators which embrace aspects of both the social and physical environment, as well as the effects of government and non-government sector interventions.

The selection of outcome indicators should be directly linked to the objectives and desired outcomes of the age-friendly initiative, and closely related to actual interventions and their expected impact. Importantly, **consideration should be given to the fact that interventions often generate both intended and unintended outcomes beyond their primary expected outcome.** For example, an intervention by the transportation sector to improve accessibility of public transportation may also indirectly improve the level of social engagement of older adults.

Alternatively, an intervention may direct resources away from interventions to enhance recreational programmes for older adults and, as a result, reduce their level of social engagement. Thus, it is important to consider direct and indirect, as well as intended and unintended outcomes when selecting outcome indicators. This means that the number and type of output indicators will not necessarily have a one-to-one correspondence with the number and type of outcome indicators. Ideally, an efficient programme will produce several outcomes through the implementation of fewer outputs.

4. Impact indicators

Impacts are the **long-term changes in people's health – their physical, cognitive and emotional function - and wellbeing**, which are expected to be brought about (at least in part) by improvements in the age-friendliness of the physical and social environment. Thus, impact indicators should correspond well to the outcome indicators.

In some cases, the emphasis of an age-friendly city initiative may be to improve the age-friendliness of the environment as a matter of human rights and for the intrinsic value of creating an age-friendly environment without explicit aspirations to improve population health or wellbeing. However, it is reasonable to expect population health gains, as well as other benefits to the wider community, if the environment is better adapted to the needs of the growing proportion of older adults, enabling them to remain highly functional, socially engaged and emotionally content over the long run. If such gains can be demonstrated, and at least partly attributed to the realized changes in the social and physical environment, it would significantly add value to the age-friendly city initiative.

While impact indicators are influenced by a wide range of factors, and would be difficult to make clear attributions to age-friendly city efforts, their inclusion in an age-friendly city indicator set is important in order to capture long-term impacts of modifying the environment. It can also provide common goals and targets for the different sectors to strive for through their coordinated efforts.

5. Equity indicators

Cross-cutting the framework is the notion of equity as a guiding principle, whereby a strong emphasis is placed on ensuring **“the absence of systematic disparities in health (or in the major social determinants of health) between social groups who have different levels of underlying social advantage or disadvantage”** (Bravema & Gruskin, 2003, p.254). Thus, it is critical to include measures of equity in age-friendliness assessments, monitoring and evaluation.

Equity indicators require disaggregation of data by social stratifiers such as gender, age, wealth and neighbourhood. Then, one of several available measures of inequality can be applied to compute an equity indicator, including simple measures that make pairwise comparisons of two population subgroups (e.g. the best- and the worst-off groups) and complex measures that use data from all subgroups (e.g. across wealth quintiles or all sub-divisions of a city) to assess inequality (WHO, 2013). It is recommendable for a measure of equity to be calculated for all indicators in an indicator set in order to examine equity in terms of inputs, outputs, outcomes and impact. Alternatively, it can be applied to one of the priority indicators as the summary equity indicator.

An approach to assessing and responding to health equity in urban environments, focusing on the social determinants of health, is described in the Urban Health Equity Assessment and Response Tool (Urban HEART) published by the WHO Kobe Centre in 2010 (WHO, 2010). Some of the methods explained in detail in Urban HEART for creating an indicator set that builds upon core indicators, displaying the equity assessment results in a visually effective way, and selecting a strategic response are applicable to addressing the equity dimension of age-friendliness.

B. Additional considerations for selecting indicators

There are some general guidelines and documents available from other sources that are useful references for selecting indicators (Brown, 2009; Davis & Kingsbury, 2011; NHS/APO, 2008). They all point to the fact that indicators must be selected through a thoughtful, systematic approach that considers not only the relevance of the indicators to the main objectives of the system or effort being measured (in this case, age-friendly city initiatives), but also whether they are measurable, technically sound and meaningful to the target audience. Careful consideration must be given to the selection of indicators as they have great potential to influence, for better or for worse, how a problem is framed as well as what actions are triggered as a result.

An important practical consideration is to **utilize routine data mechanisms and existing data bases** for selecting, collecting and analysing the indicators. This will help reduce burden and increase sustainability of data management. The scope of indicators required for measuring age-friendliness is broad, but it is likely that many of the indicators are routinely collected by different city departments, research institutions, community organizations and other stakeholders, or they could be derived or adapted from existing indicators. Caution is necessary, however, to avoid over-reliance on routinely used indicators, as this could hamper the development of creative, aspirational indicators.

During the development process of the core indicators presented in this guide, experts were consulted about key criteria for selecting the indicators for age-friendly cities, and the following criteria were established:

- **Measurable:** Is the indicator actually measurable or observable?
- **Valid:** Is the indicator measuring what it is supposed to measure? For example, does the indicator “proportion of roads suitable for walking” provide a suitable measure for determining “walkability”?
- **Replicable:** Can the indicator be collected in a standard way across time (for local benchmarking) or across different contexts (for inter-city comparison)?
- **Sensitive to change:** Will variations in the indicator be observable over time on account of specific actions?
- **Disaggregation possible:** Can the indicator be disaggregated by gender, age group, or across neighbourhoods? There are other stratifiers, too, that could be important in the local context, including ethnicity, socioeconomic status, etc.
- **Aligns with local goals and targets:** Does the indicator link to a broader local agenda?
- **Can be linked to action:** Does the indicator provide an understanding of the various actions that might need to be undertaken?
- **Within local influence:** Does the local government or community have the mandate or authority to act on this indicator? For example, a federal insurance scheme is mostly beyond the influence of the municipal government.
- **Easy to collect:** Are the data required to produce the indicator easy to collect in a timely manner?
- **Socially acceptable:** Is the collection of this information acceptable to the communities and individuals concerned?

V. Core indicators

This section presents a set of core indicators for age-friendly cities which were developed based on the best available evidence obtained through the process described in Annex 1 of this guide. The core indicators consist of the most critical and minimal set of indicators that could be used in monitoring and evaluating age-friendly urban environments. The core indicator set would best be used to point to results that need further exploration, rather than as definitive assessments of success or failure. In addition to the core indicators, a set of supplementary indicators is also presented. These supplementary indicators can allow for a broader assessment of age-friendliness. Together, these indicators provide a starting point for developing a locally relevant but also externally comparable age-friendly city indicator set.

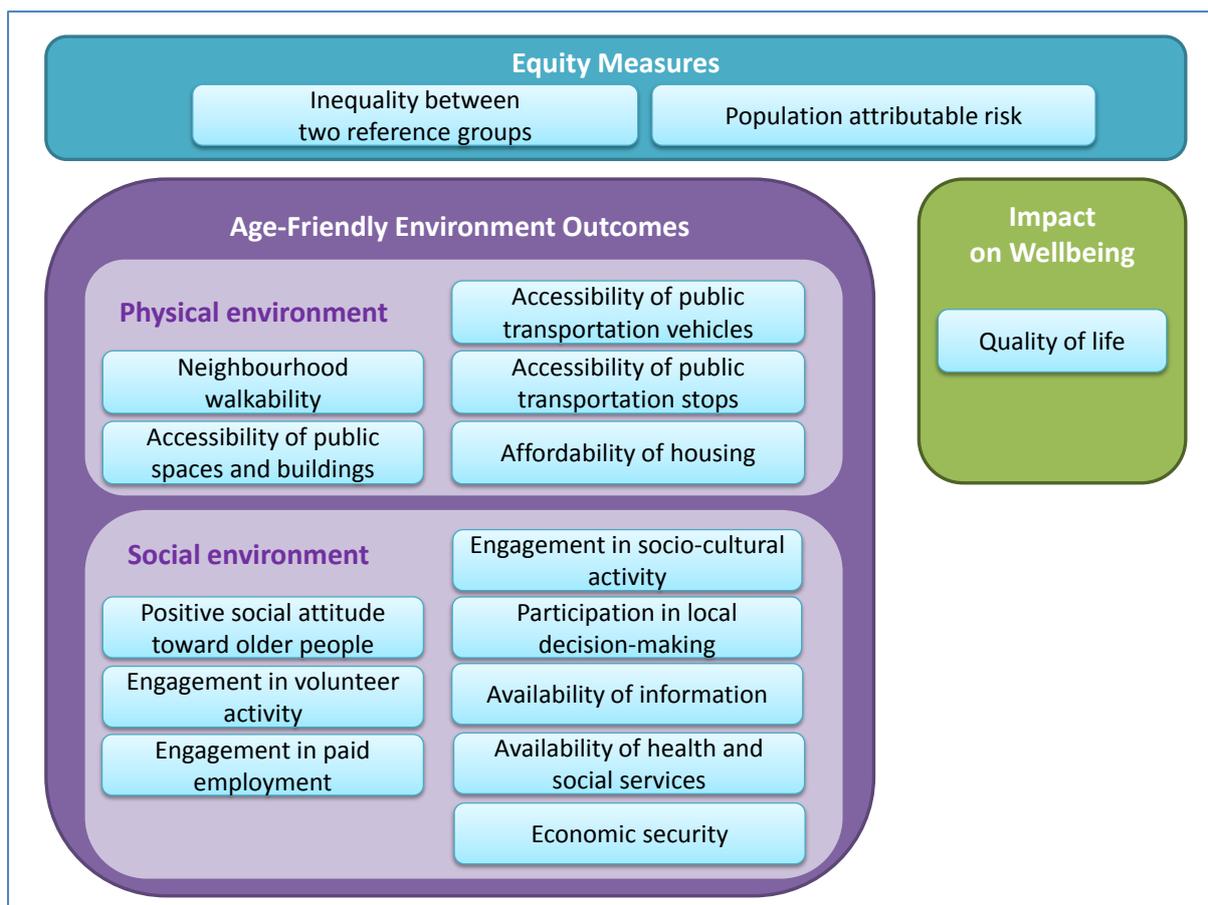


Figure 2. Core indicators of Age-friendly Cities

The core indicators mainly focus on outcome and impact indicators rather than on input and output indicators (Figure 2). This is because age-friendly city initiatives, regardless of context, share similar goals and objectives for improving the age-friendliness of the domains of the urban environment (i.e. outcomes) in order to ensure quality of life as people age (i.e. impact), whereas the resources they use (i.e. inputs) and the interventions they implement (i.e. outputs) can vary substantially depending on the local context. The literature review findings and expert opinions that emerged during the core indicator development process also converged on the outcome and impact indicators. In addition, measures of equity, as a key principle, are included in the core indicator set. Detailed descriptions of each indicator are provided in the next section.

A. Core Indicators: Operational Definitions

The core indicators are presented in the tables below. For each indicator, two types of operational definitions are provided: one is a definition that is suitable when using data collected by local government agencies, service providers, and community organizations about their community; the other is a definition that places emphasis on the perspective of the older person and is more appropriate when using self-report surveys as the data source. The two definitions can also be used in a pair to complement and validate the information that they provide.

Each indicator also has information on suggested data sources, comments, key references, and additional resources on how to measure the indicators in practice. In some cases, the finer details of the operational definition will have to be determined locally, due to the lack of a globally accepted

or standardized definition at this time, or due to the highly contextual nature of the indicator. Furthermore, the suggested operational definitions for the core indicators err on the side of being realistic than aspirational, and simple than complex, in order to facilitate uptake of the indicators.

With regard to how the “older population” is defined (for example, in survey data), in general, WHO approaches ageing from a life-course perspective rather than artificially categorizing life into stages such as “middle age” or “old age”. Nevertheless, for statistical purposes, WHO generally applies 60 years and over as a cutoff, while for various reasons, in some analyses it will use other cutoffs, such as 50, 65 or 80. For the purpose of comparability, 60 is suggested for the statistical cutoff. However, the most appropriate cutoff for statistical purposes should be determined locally, considering the demographic profile of the local population and accepted statistical practices. Whenever possible, data collection and analysis should be based on narrow age bands in order to better understand the finer nuances of chronological ageing.

As a general rule, when developing survey questions to measure an indicator, it may be more desirable to use a scaled response option (e.g. 5-point scale ranging from ‘1 = strongly disagree’ to ‘5 = strongly agree’ to measure the level of agreement with a statement, or from ‘1 = never’ to ‘5 = always’ to measure the level of frequency), rather than a binary one (e.g. ‘1 = yes’ or ‘0 = no’), to enable measurement of incremental changes. Disaggregation of the indicator data by population subgroup (e.g. gender, age groups, income level) or administrative area is strongly encouraged in order to obtain a more detailed assessment that would be sensitive to inequalities (see earlier section on Equity Indicators).

1. Neighbourhood walkability

Suggested definition Proportion of streets in the neighbourhood that have pedestrian paths which meet locally accepted standards.

Suggested data sources:
- Field survey of city streets
- Administrative data on city planning, roads and infrastructure

Suggested definition using self-report data Proportion of older people who report that their neighbourhood is suitable for walking, including for those who use wheelchairs and other mobility aids.

Suggested data sources:
- Survey of older residents

Comments Neighbourhood walkability refers to the extent that a neighbourhood design supports walking. Walkability is characterized by a range of features including mixed land use, accessibility of destinations, safety, and the availability, quality and connectivity of pedestrian facilities.

Several methods are currently available for assessing neighbourhood walkability using both quantitative and qualitative data (see 'Additional resources' below). The suggested definition focuses on one key aspect of walkability – i.e. availability of accessible pedestrian paths. Locally accepted standards (path wide enough, no step to road, obstacle free, etc.) should be applied. This indicator can be supplemented with additional indicators for a more comprehensive assessment of neighbourhood walkability.

Key references Canada Mortgage and Housing Corporation (2008). Community indicators for an aging population. Canada: Canada mortgage and Housing Corporation. (<http://www.cmhc-schl.gc.ca/odpub/pdf/66099.pdf>, accessed 2 May 2014).

Additional resources

International resources
Global Walkability Index. Clean Air Asia [website]. (<http://cleanairinitiative.org/portal/node/4238>, accessed 5 May 2014)

Leather J, Fabian H, Gota S, Mejia A (2011). Walkability and pedestrian facilities in Asian cities: state and issues. ADB Sustainable Development Working Paper. (<http://esci-ksp.org/wp/wp-content/uploads/2012/04/Walkability-and-Pedestrian-Facilities-in-Asian-Cities.pdf>, accessed 5 May 2014).

National resources
Bicycling and Walking in the United States: 2014 Benchmarking Report. Washington, D.C.: Alliance for Biking and Walking. (<http://www.bikewalkalliance.org/resources/benchmarking>, accessed 25 July 2014)

Standardized Survey of Walking & Bicycling Database [database]. U.S. National Cancer Institute. (<http://appliedresearch.cancer.gov/paq/>, accessed 17 April 2014)

Kihl M, Brennan D, Gabhawala N, List J, Mittal P (2005). Livable communities: An evaluation guide. Washington, D.C.: American Association of Retired Persons. (http://assets.aarp.org/rgcenter/il/d18311_communities.pdf, accessed 8 May 2014).

2. Accessibility of public spaces and buildings

Suggested definition	<p>Proportion of new and existing public spaces and buildings that are fully accessible by wheelchair.</p> <p>Suggested data sources:</p> <ul style="list-style-type: none">- Field survey of new and existing public spaces and buildings- Administrative data on city planning, building safety/permits, and parks
Suggested definition using self-report data	<p>Proportion of older people who report that public spaces and buildings in their community are accessible for all people, including those who have limitations in mobility, vision or hearing.</p> <p>Suggested data sources:</p> <ul style="list-style-type: none">- Survey of older residents
Comments	<p>The suggested indicator (i.e. accessibility by wheelchair) can be supplemented with additional indicators for a more comprehensive assessment of compliance with universal design (or inclusive design) standards. Universally designed buildings and spaces enable access for everyone, including children, older people and people with functional limitations. The buildings and spaces are easily understood regardless of experience or knowledge, minimize hazards and accidental or unintended actions, and can be used efficiently and comfortably with a minimum of physical effort. Several guidelines on universal design are currently available (see 'Additional resources' below); locally accepted standards should be applied.</p>
Key references	
Additional resources	<p><u>International resources</u></p> <p>Canadian Human Rights Commission (2006). International Best Practices in Universal Design. (http://www.gaates.org/documents/BP_en.pdf accessed 17 April 2014)</p> <p>SOLIDERE & ESCWA: Accessibility: Accessibility for the Disabled. A Design Manual for a Barrier Free Environment [website] (http://www.un.org/esa/socdev/enable/designm/index.html accessed 17 April 2014)</p> <p><u>National resources</u></p> <p>Australian Government. Accessibility Design Guide: Universal design principles for Australia's aid program. A companion volume to Development for All: Towards a disability-inclusive Australian aid program 2009-2014. (www.g3ict.org/download/p/fileId_961/productId_271 accessed 17 April 2014)</p> <p>United States Access Board: Advancing Full Access and Inclusion for All. (http://www.vtppi.org/tm/tm69.htm accessed 17 April 2014)</p> <p><u>Local resource</u></p> <p>The City of New York: Universal Design New York. (http://idea.ap.buffalo.edu//Publications/pdfs/udny1.pdf accessed 17 April 2014)</p>

3. Accessibility of public transportation vehicles

Suggested definition Proportion of public transport vehicles with designated places for older people or people who have disabilities.

Suggested data sources:
- Administrative data from local transit authority

Suggested definition using self-report data Proportion of older people who report that public transport vehicles (e.g. train cars, buses) are physically accessible for all people, including those who have limitations in mobility, vision or hearing.

Suggested data sources:
- Survey of older residents

Comments Physical accessibility of public transport refers to the ability of people with disabilities and older people to safely ride in a public transport vehicle in order to reach their destination. Several guidelines on accessible public transport are currently available (see 'Additional resources' below); locally accepted standards should be applied. The suggested indicator on availability of designated seating areas can be supplemented with additional indicators for a more comprehensive assessment of public transport vehicle accessibility.

Key references European Commission; Intelligent Energy Europe. Eltis; Urban mobility portal of EU [website] (<http://www.eltis.org/index.php?ID1=4&id=31>, accessed 2 May 2014)

Additional resources

International resources

Access Exchange International: Paratransit for mobility-impaired persons in developing countries: Starting up and scaling up. (http://www.gaates.org/documents/Paratransit_Guide.pdf accessed 17 April 2014)

International Association of Public Transport: Improving Access to public transport. (<http://www.internationaltransportforum.org/IntOrg/ecmt/pubpdf/04Access.pdf> accessed 17 April 2014)

Methodology for describing the accessibility of transport in Europe. (Mediate). [website] (<http://www.mediate-project.eu/> accessed 17 April 2014)

United Nations Development Program. A Review of International Best Practices in Accessible Public Transportation for Persons with Disabilities. (http://www.undp.org.my/files/editor_files/files/reports%20and%20publications/PWD%20transport%20publication.pdf accessed 17 April 2014)

World Bank. Transport Strategy to Improve Accessibility in Developing Countries. (<http://siteresources.worldbank.org/INTTSR/Resources/accessibility-strategy.pdf> accessed 17 April 2014)

Local resource

Victoria Transportation Policy Institute: Transportation Systems that Accommodate All Users, Including People With Disabilities and Other Special Needs (<http://www.vtpi.org/tdm/tdm69.htm> accessed 17 April 2014)

4. Accessibility of public transportation stops

Suggested definition Proportion of housing within walking distance (500 m) to a public transportation stop.

Suggested data sources:

- Administrative data from local transit authority or city planning department

Suggested definition using self-report data Proportion of older people who report that public transportation stops are too far from home.

Suggested data sources:

- Survey of older residents

Comments Accessibility of transportation stops in this context refers to the distance from the homes of older people to public transportation stops. If door-to-door services of public transportation are available, the proportion of housing within the coverage area of door-to-door services could be an alternative indicator. Additional indicators would be needed to take into consideration the safety and quality of the route to the transportation stop, and the accessibility of transportation stops to/from important destinations (e.g. community centres, healthcare service, grocery stores, banks, etc.).

Key references Canada Mortgage and Housing Corporation (2008). Community indicators for an aging population. Canada: Canada mortgage and Housing Corporation. (<http://www.cmhc-schl.gc.ca/odpub/pdf/66099.pdf>, accessed 2 May 2014).

Additional resources

International resources

Access Exchange International: Paratransit for mobility-impaired persons in developing countries: Starting up and scaling up.

(http://www.gaates.org/documents/Paratransit_Guide.pdf accessed 17 April 2014)

International Association of Public Transport: Improving Access to public transport.

(<http://www.internationaltransportforum.org/IntOrg/ecmt/pubpdf/04Access.pdf> accessed 17 April 2014)

Methodology for describing the accessibility of transport in Europe. (Mediate). [website] (<http://www.mediate-project.eu/> accessed 17 April 2014)

United Nations Development Program. A Review of International Best Practices in Accessible Public Transportation for Persons with Disabilities.

(http://www.undp.org.my/files/editor_files/files/reports%20and%20publications/PWD%20transport%20publication.pdf accessed 17 April 2014)

World Bank. Transport Strategy to Improve Accessibility in Developing Countries.

(<http://siteresources.worldbank.org/INTTSR/Resources/accessibility-strategy.pdf> accessed 17 April 2014)

Local resource

Victoria Transportation Policy Institute: Transportation Systems that Accommodate All Users, Including People With Disabilities and Other Special Needs (<http://www.vtpi.org/tm/tm69.htm> accessed 17 April 2014)

5. Affordability of housing

Suggested definition	Proportion of older people who live in a household that spends less than 30 per cent of their equalized disposable income on housing. Suggested data sources: - Household census - Administrative data from department of economic affairs or housing - Public expenditure report
Suggested definition using self-report data	Proportion of older people who report that housing in their neighbourhood is affordable. Suggested data sources: - Survey of older residents
Comments	Housing costs include renting costs, mortgage payment, and repair and maintenance costs. The threshold of 30 per cent of disposable household income is based on existing practice (see references and resources below). Locally accepted thresholds for defining affordability can be applied.
Key references	Canada Mortgage and Housing Corporation (CMHC) (2008). Community Indicators for an Aging Population (www.cmhc-schl.gc.ca/odpub/pdf/66099.pdf , accessed 1 May 2014) Minister of social development (2007). Positive aging indicators. Wellington: Minister of social development (https://www.msd.govt.nz/documents/about-msd-and-our-work/publications-resources/monitoring/postive-age-indicators/positive-ageing-indicators-2007.pdf , accessed 1 May 2014)
Additional resources	<u>National resource</u> Australian Bureau of Statistics (2013). Household incomes - equivalised [webpage] (http://www.abs.gov.au/AUSSTATS/abs@.nsf/Latestproducts/A390E2529EC00DFECA25720A0076F6C6?opendocument accessed 5 May 2014).

6. Positive social attitude toward older people

Suggested definition	Number of reported cases of maltreatment of older persons (as a proportion of the total number of older people). <i>(*A <u>lower</u> number can be indicative of a society in which the dignity and respect of older persons are protected.)</i> Suggested data sources: - Data collected by local law enforcement authorities, health/social service providers, or community groups addressing (elderly) abuse prevention
Suggested definition using self-report data	Proportion of older people who report feeling respected and socially included in their community. Suggested data sources: - Survey of older residents
Comments	Maltreatment of older persons is a single or repeated act, or lack of appropriate action, occurring within any relationship where there is an expectation of trust which causes harm or distress to an older person. This type of violence constitutes a violation of human rights and includes physical, sexual, psychological, emotional; financial and material abuse; abandonment; neglect; and serious loss of dignity and respect. Maltreatment of elderly people is an important public health problem. Older people are often afraid to report cases of maltreatment to family, friends, or to

	<p>the authorities. Therefore, caution is required in interpreting low numbers of reported cases of maltreatment of older people, as it may reflect undesirable conditions.</p> <p>Ageism is discrimination or unfair treatment based on a person's age, specifically discrimination against older people; absence of ageism is another indicator of a society's inclusiveness and respect for older people.</p>
Key references	<p>Cherry KE, Palmore E (2008). Relating to older people evaluation (ROPE): A measure of self-reported ageism. <i>Educ Gerontol.</i> 34(10): 849-86. doi:10.1080/03601270802042099.</p> <p>De Donder L, Lang G, Penhale B, Ferreira-Alves J, Tamutiene I, Verté D, Luoma ML. (2013). Item non-response when measuring elder abuse: influence of methodological choices. <i>Eur J Public Health.</i> 23 (6): 1021-1026.</p> <p>WHO (2011). European report on preventing elder maltreatment. Copenhagen: WHO Regional Office for Europe. (http://www.euro.who.int/data/assets/pdf_file/0010/144676/e95110.pdf, accessed 5 August 2014)</p>
Additional resources	<p><u>International resource</u> WHO Violence and Injury Prevention – Prevention of Elder Maltreatment (http://www.who.int/violence_injury_prevention/violence/elder_abuse/en/, accessed 5 August 2014)</p> <p>European Social Survey: Experiences and Expressions of Ageism (http://www.europeansocialsurvey.org/docs/findings/ESS4_gb_toplines_experiences_and_expressions_of_ageism.pdf accessed 5 May 2014)</p> <p><u>Local resource</u> Centers for Disease Control and Prevention. Injury Prevention and Control – Elder Abuse. (http://www.cdc.gov/violenceprevention/elderabuse/index.html, accessed 5 August 2014)</p>

7. Engagement in volunteer activity

Suggested definition	<p>Proportion of older people in local volunteer registries.</p> <p>Suggested data sources:</p> <ul style="list-style-type: none"> - Administrative data from local government - Reports from local organizations with volunteer registries
Suggested definition using self-report data	<p>Proportion of older people who report engaging in volunteer activity in the last month on at least one occasion.</p> <p>Suggested data sources:</p> <ul style="list-style-type: none"> - Survey of older residents
Comments	<p>While volunteer activity is generally considered to be a positive indication of older people's social participation and contribution, it is not a desirable situation if they would rather be engaging in <i>paid</i> work but that option is not available to them because of their age. Therefore, an additional indicator worth considering is the level of satisfaction with, or desirability of, the volunteer activity from the older person's perspective. The types of volunteer activity, setting (e.g. schools, neighbourhood) and frequency of participation to be measured can be determined locally, as appropriate.</p>
Key references	<p>Minister of social development (2007). Positive aging indicators. Wellington: Minister of social development (https://www.msd.govt.nz/documents/about-</p>

msd-and-our-work/publications-resources/monitoring/postive-age-indicators/positive-ageing-indicators-2007.pdf, accessed 1 May 2014)

Office National Statistics of UK government (2013). Measuring national well-being: older people's leisure time and volunteering [website]. (<http://www.ons.gov.uk/ons/rel/wellbeing/measuring-national-well-being/older-people-and-leisure-time---2013/art-measuring-national-well-being-amount-of-leisure-time-and-volunteering.html> accessed 5 May 2014)

Additional resources

8. Paid employment

Suggested definition	Proportion of older people who are currently unemployed. (*A <i>lower unemployment rate is indicative of greater availability of paid employment opportunities for older people.</i>) Suggested data sources: - Labour statistics
Suggested definition using self-report data	Proportion of older people who report to have opportunities for paid employment. Suggested data sources: - Survey of older residents
Comments	When the more direct measures of paid employment opportunities are not available, measures of <i>unemployment</i> may be used instead, as this takes into account whether the individual considers him/herself to be in the labour market (i.e. looking for work but not currently employed). This may be a more sensitive indicator of employment opportunities as it captures lack of positions instead of successful employment. While engagement in paid labour is generally considered to be a positive indication of older people's access to employment, social participation, inclusion and contribution, it is not a desirable situation if they would rather be retired but that option is not available to them because of their lack of economic security. Therefore, an additional indicator worth considering is the level of satisfaction with, or desirability of, the opportunities for paid work from the older person's perspective. The frequency of engagement in paid employment can be determined locally, as necessary.
Key references	Minister of social development (2007). Positive aging indicators. Wellington: Minister of social development (https://www.msd.govt.nz/documents/about-msd-and-our-work/publications-resources/monitoring/postive-age-indicators/positive-ageing-indicators-2007.pdf , accessed 1 May 2014)
Additional resources	

9. Engagement in socio-cultural activity

Suggested definition	Proportion of older adults among all reported visitors to local cultural facilities and events. Suggested data sources: - Administrative data from city department of cultural affairs - Demographic data of visitors reported by cultural facilities and events
Suggested definition using self-report data	Proportion of older people who report participating in socio-cultural activities at their own discretion at least once in the last week.

	Suggested data sources: - Survey of older residents
Comments	Participation in socio-cultural activities is a positive indication of older people's social participation and inclusion, and generally includes leisurely participation in formal or informal religious, cultural or other social activities with friends, relatives or neighbours. The focus is on face-to-face encounters, although online encounters and activities may become increasingly important with successive generations of older adults. The specific types of activities to be included in this indicator and the frequency of participation can be determined locally, as necessary.
Key references	Canada Mortgage and Housing Corporation (2008). Community indicators for an aging population. Canada: Canada mortgage and Housing Corporation. (http://www.cmhc-schl.gc.ca/odpub/pdf/66099.pdf , accessed 2 May 2014). Vision 2020 (2008). Sustainability Indicators Report. Hamilton: Vision 2020 (http://sustainablecities.net/our-resources/document-library/doc_download/216-icsp-s-monitoring-and-evaluating-success , accessed 2 May 2014).
Additional resources	

10. Participation in local decision-making

Suggested definition	Proportion of eligible older voters who voted in the most recent local election or legislative initiative. Suggested data sources: -Administrative data from local government
Suggested definition using self-report data	Proportion of older people who report being involved in decision-making about important political, economic and social issues in the community. Suggested data sources: - Survey of older residents
Comments	Other indicators of older people's participation in local decision-making can include, for example, the representation of older people (either direct or indirect) in the local government council and other local decision-making bodies and fora (e.g. town hall meetings).
Key references	World Health Organization (2010). Urban Heart. Kobe: World Health Organization (http://www.who.int/kobe_centre/publications/urban_heart_manual.pdf , accessed 2 May 2014).
Additional resources	

11. Availability of information

Suggested definition	Availability of local sources providing information about health concerns and service referrals, including by phone. Suggested data sources: - Administrative data from city health department
Suggested definition using self-report data	Proportion of older people who report that local sources of information about their health concerns and service needs are available. Suggested data sources: - Survey of older residents

Comments	
Key references	Vladeck F, Segel R, Oberlink M, Gursen MD, Rudin D (2010). Health indicators: a proactive and systematic approach to healthy aging. <i>A Journal of Policy Development and Research</i> . 12(2): 67-81
Additional resources	

12. Availability of social and health services

Suggested definition	Number of older persons with personal care or assistance needs receiving formal (public or private) home-based services. Suggested data sources: - Administrative data from city government on health and social services - Official reports from local home-based health and social service providers
Suggested definition using self-report data	The proportion of older people who report having their personal care or assistance needs met in their home setting through the use of formal (public or private) services. Suggested data sources: - Survey of older residents
Comments	Home-based social and health services cover a wide range of services. They are essential for older people with health conditions or functional limitations which inhibit their ability to live independently and maintain a high quality of life. The core indicator focuses on the availability of <i>formal</i> home-based services; in contexts where informal care plays a major role, the indicator should be adapted to account for this. The need for services can be determined based on self-report, diagnosed health conditions and/or functional limitations. More detailed indicators would be necessary to determine the unmet need for specific types of services in the community (e.g. home health, personal care).
Key references	
Additional resources	

13. Economic security

Suggested definition	Proportion of older people living in a household with a disposable income above the risk-of-poverty threshold. Suggested data sources: - Labour statistics - Administrative data from economic affairs department
Suggested definition using self-report data	Proportion of older people who report having had enough income to meet their basic needs over the previous 12 months without public or private assistance. Suggested data sources: - Survey of older residents
Comments	Economic security is an individual's economic situation that allows the individual to maintain their standard of living and meet their basic needs now and in the near future without public or private assistance. The European Union sets the risk-of-poverty threshold at 60 % of the national median equivalised disposable income (after social transfers). The equivalised income is calculated by dividing the total household income by its size determined after applying the following weights: 1.0 to the first adult, 0.5 to

	<p>each other household members aged 14 or over, and 0.3 to each household member aged less than 14 years old (see references below).</p> <p>The time reference (e.g. 12 months) for the measure of perceived economic security, as well as the risk-of-poverty threshold, can be adapted locally, as appropriate.</p>
Key references	<p>International Labour Organization. Economic security index [website]. (ILO: http://www.ilo.org/dyn/sesame/SESHELP.NoteESI accessed 5 May 2014)</p>
Additional resources	<p><u>International resources</u></p> <p>Australian Bureau of Statistics (2013). Household incomes - equivalised [webpage] (http://www.abs.gov.au/AUSSTATS/abs@.nsf/Latestproducts/A390E2529ECO0DFECA25720A0076F6C6?opendocument accessed 5 May 2014).</p> <p>European Commission - Eurostat (2014). People at risk of poverty or social exclusion [website] (http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/People_at_risk_of_poverty_or_social_exclusion , accessed 5 August 2014)</p> <p>European Commission (2003). 'Laeken' indicators – Detailed calculation methodology. (http://www.cso.ie/en/media/csoie/eusilc/documents/Laeken,Indicators,-,calculation,algorithm.pdf, accessed 5 May 2014).</p>

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14. Quality of Life

Suggested definition	Healthy Life Expectancy at birth Suggested data sources: - Administrative data and reports from city health department
Suggested definition using self-report data	Proportion of older people who rate their overall Quality of Life as 'very good (5)' or 'good (4)' on a scale ranging from 'very poor (1)' to 'very good (5)'. Suggested data sources: - Survey of older residents
Comments	<p>The indicator of healthy life expectancy at birth focuses on the average number of years that a person can expect to live in "full health" by taking into account years lived in less than full health due to disease and/or injury.</p> <p>The indicator of quality of life focuses on "an individual's perception of their position in life in the context of the culture and value system in which they live and in relation to their goals, expectation, standards and concerns" (WHO, 1997 p.1).</p> <p>Other possible measures of Quality of Life include Subjective Well-being (See additional resources below.)</p>
Key references	Forsyth A, Schmitz K, Oakes M (2003). Twin cities walking survey. Minneapolis: University of Minnesota. (http://activelivingresearch.org/node/10619 , accessed 2 May 2014).
Additional resources	<p><u>International resources</u> OECD (2013), OECD Guidelines on Measuring Subjective Well-being, OECD Publishing. (http://dx.doi.org/10.1787/9789264191655-en, accessed 5 August 2014).</p> <p>World Health Organization (2014). WHO methods for life expectancy and healthy life expectancy. Global Health Estimates Technical Paper WHO/HIS/HSI/GHE/2014.5. (http://www.who.int/healthinfo/statistics/LT_method.pdf?ua=1 accessed 5 May 2014).</p> <p>World Health Organization. Healthy life expectancy (HALE) [website] (http://www.who.int/healthinfo/statistics/indhale/en/ accessed 5 May 2014).</p> <p>World Health Organization. WHO Quality of Life-BREF (WHOQOL-BREF) [website] (http://www.who.int/mental_health/media/68.pdf accessed 17 April 2014)</p>

The final two core indicators are equity indicators. **These are not indicators for which additional data need to be collected**; rather, they require disaggregation (breaking down) of any, or all, of the other indicators by social stratifiers such as gender, age, wealth or geographic units, like neighbourhoods, to assess any unfair inequalities between them in regards to a specific indicator of interest (e.g. participation in local decision-making).

Both equity indicators included in the core indicator set are simple measures based on a comparison between one subgroup in the population (e.g. the best-off group) and the total population, or between two subgroups in the population (e.g. the best- and the worst-off groups). There are also more complex measures of inequality that use data from all subgroups (e.g. across wealth quintiles or all sub-divisions of a city) which are described in another WHO handbook (WHO, 2013).

The two measures presented here should be calculated for all indicators in an indicator set in order to examine equity and monitor their change over time. Alternatively, it can be applied to a selected priority indicator, as the summary equity indicator. While they are termed equity indicators, they do not necessarily reveal inequities in and of themselves. Whether or not an *inequality*, a difference, is an *inequity*, a systematic, unfair difference, demands a qualitative evaluation of the pattern of inequality, taking into consideration universal values such as human rights and justice, as well as local values and perspectives.

15. Equity indicator - Population attributable risk	
What is this measure?	A measure of inequality which shows the extent of improvement possible if all subgroups had the same rate as a reference subgroup.
Calculation	<p><i>Population attributable risk</i> = subtract the rate of the outcome of interest (e.g. coverage gap) in the reference subgroup from that of the total population for a measure of absolute inequality and improvement possible.</p> <p><i>Population attributable risk percentage</i> = divide the population attributable risk by the overall rate in the total population for a measure of relative inequality and proportional improvement possible.</p>
Suggested data source	Data on the age-friendly city core indicators listed above (1-14) disaggregated by geographic or socioeconomic subgroups (e.g. gender, age, income level).
Comments	<p>When the reference subgroup is that which has the best outcome or the highest socioeconomic position in the population of interest, this indicator shows the difference between the population average and the highest attainable levels of the outcome of interest in a population. Other reference groups could be selected based on any geographic or socioeconomic subgroups of interest from an equity perspective.</p> <p>This measurement can be used for ordered or nonordered groups, and can take into account subgroups of different sizes. Other more complex measures are also available for producing a single number that is an expression of the amount of inequality existing across all subgroups of a population. See reference below for more guidance on measuring and reporting health inequalities.</p>
Key references	WHO. <i>Handbook on health inequality monitoring: with a special focus on low- and middle-income countries</i> . Geneva, World Health Organization, 2013 (http://apps.who.int/iris/bitstream/10665/85345/1/9789241548632_eng.pdf , accessed 9 April 2014).
Additional resources	WHO (2010). Urban Health Equity Assessment and Response Tool. Kobe:

WHO (http://www.who.int/kobe_centre/publications/urban_heart/en/, accessed 3 June 2014).

16. Equity indicator - Inequality between two reference groups

What is this measure?	The magnitude of difference in a specific outcome between two reference subgroups in the population.
Calculation	<p><i>Difference</i> = subtract the mean value of the outcome of interest in one reference subgroup from the mean value of that indicator in the other reference subgroup for a measure of absolute inequality.</p> <p><i>Ratio</i> = divide the mean value of the outcome of interest in one reference subgroup by the mean value of that indicator in the other reference subgroup for a measure of relative inequality.</p>
Suggested data source	Data on the age-friendly city core indicators listed above (1-14) disaggregated by geographic or socioeconomic subgroups (e.g. gender, age, income level).
Comments	<p>When the two reference groups are the subgroup with the best outcome or the highest socioeconomic position (i.e. the best-off) and the subgroup with the worst outcome or the lowest socioeconomic position (i.e. the worst-off) in the population of interest, this indicator shows the difference between the lowest and the highest attainable levels of outcome in the population of interest. It can also be used to assess gender equity by comparing women and men.</p> <p>Simple measures that make pairwise comparisons of two population subgroups are straightforward in nature and easy to both produce and understand. For a description of inequality that exists across the entire population, other more complex measures should be used, although complex measures do not necessarily present a substantially better assessment of inequality than the simpler measures. See reference below for more guidance on measuring and reporting health inequalities.</p>
Key references	WHO. <i>Handbook on health inequality monitoring: with a special focus on low- and middle-income countries</i> . Geneva, World Health Organization, 2013 (http://apps.who.int/iris/bitstream/10665/85345/1/9789241548632_eng.pdf , accessed 9 April 2014).
Additional resources	WHO (2010). Urban Health Equity Assessment and Response Tool. Kobe: WHO (http://www.who.int/kobe_centre/publications/urban_heart/en/ , accessed 3 June 2014).

VI. Supplementary indicators

The indicators listed below were strong candidates for inclusion in the core indicator set but ultimately were not included for various reasons (see indicator selection criteria described in section IV.B. of this guide). These indicators should be considered for inclusion in a local indicator set, along with the core indicators, as appropriate.

1. Accessibility of priority vehicle parking	
Suggested definition	<p>Proportion of priority parking spaces at new and existing public facilities that are designated for older people or people with disabilities.</p> <p>Suggested data sources: - Administrative data on city planning, building safety/permits and parks</p>
Suggested definition using self-report data	<p>Proportion of older people with a special parking permit for older or disabled drivers who report that designated priority parking spaces are adequately designed and available.</p> <p>Suggested data sources: - Survey of older residents</p>
Comments	<p>In societies where private car use is the main means of transportation, accessibility of priority parking can be important for older people's mobility. Priority parking refers to accessible parking spaces designed for people meeting certain criteria, such as having a disability. Several guidelines on priority parking are currently available (see 'Additional resources' below); locally accepted priority parking standards (e.g. width of parking space, signs etc.) should be applied. The suggested definition captures only the availability of priority car parking spaces; additional indicators would be required for a more comprehensive assessment of the accessibility of priority parking.</p>
Key references	
Additional resources	<p><u>International resource</u> SOLIDERE & ESCWA. Accessibility for the disabled: a design manual for a barrier free environment [website] (http://www.un.org/esa/socdev/enable/designm/index.html accessed 6 May 2014)</p> <p><u>National resource</u> U.S. Department of Justice. Civil Rights Division. Disability Rights Section [website] (http://www.ada.gov/restripe.pdf, accessed 6 May 2014)</p> <p><u>Local resource</u> Committee on Architectural Barrier-Free Design. Governor's Commission on Disability [website] (http://www.nh.gov/disability/information/architectural/documents/design_standards_parking.pdf, accessed 6 May 2014)</p>

2. Accessibility of housing

Suggested definition	<p>Proportion of new and existing houses that have wheelchair-accessible entrances (i.e. sufficient width, ramp).</p> <p>Suggested data sources: - Administrative data from department of housing</p>
Suggested definition using self-report data	<p>Proportion of older people who report that their house is adapted, or can be adapted, to their needs to facilitate ageing at home.</p> <p>Suggested data sources: - Survey of older residents</p>
Comments	<p>The suggested indicator can be supplemented with additional indicators for a more comprehensive assessment of compliance with universal design (or inclusive design) standards. Universally designed housing enables access for everyone, including children, older people and people with functional limitations. The features of universally designed housing are adapted, and adaptable, in order to respond to the individual needs and circumstances of people as they age. Several guidelines on universal housing design are currently available (see 'Additional resources' below); locally relevant, appropriate and acceptable standards should be applied.</p>
Key references	<p>Canada Mortgage and Housing Corporation (2008). Community Indicators for an Aging Population. (www.cmhc-schl.gc.ca/odpub/pdf/66099.pdf accessed 7 May, 2014).</p> <p>National Affordable Homes Agency (2008). 721 Housing Quality Indicators Form. (http://www.homesandcommunities.co.uk/sites/default/files/our-work/721_hqi_form_4_apr_08_update_20080820153028.pdf, accessed 6 May 2014).</p>
Additional resources	<p><u>International resource</u> SOLIDERE & ESCWA. Accessibility for the disabled: a design manual for a barrier free environment [website] (http://www.un.org/esa/socdev/enable/designm/index.html accessed 6 May 2014).</p> <p><u>National resources</u> Kihl M, Brennan D, Gabhawala N, List J, Mittal P (2005). Livable communities: An evaluation guide. Washington: American Association of Retired Persons. (http://assets.aarp.org/rgcenter/il/d18311_communities.pdf, accessed 8 May 2014).</p> <p>National Affordable Homes Agency (2008). 721 Housing Quality Indicators Form. (http://www.homesandcommunities.co.uk/sites/default/files/our-work/721_hqi_form_4_apr_08_update_20080820153028.pdf, accessed 6 May 2014).</p> <p>UK government (2012) Non-Mainstream Housing Design Guidance: Literature Review. (https://www.homesandcommunities.co.uk/non-mainstream-housing-design-guidance, accessed 6 May 2014).</p> <p><u>Local resource</u> Hartje SC (2010). Recommendations for essential and advanced universal design features and product characteristics in new, single-family housing in Washington. Housing task force: Northwest Universal Design Council. (http://www.environmentsforall.org/docs/UD_Guidelines_Compiled.pdf, accessed 6 May 2014).</p>

3. Participation in leisure-time physical activity in a group

Suggested definition	<p>Proportion of older people who are a member of a self-organized or institutional leisure-time physical activity group.</p> <p>Suggested data sources: - Demographic data of members reported by local clubs, associations or facilities for group sports and other physical activities</p>
Suggested definition using self-report data	<p>Proportion of older people who report participating in group physical activities in their leisure time.</p> <p>Suggested data sources: - Survey of older residents</p>
Comments	<p>The focus of this indicator is on leisure-time group physical activity, including play, sports and planned exercise. The aim is to capture the positive aspects of both physical activity and social participation. Other forms of physical activity, such as commute/transport, occupational activity and household chores, are more likely to be done out of need rather than desire, and not as likely to involve social participation.</p> <p>The specific types of activities and groups or facilities to be included in this indicator can be determined locally, as appropriate. More specific measures of physical activity are possible, with specifications of the type, duration, frequency and intensity of exercise. However, assessing optimal levels of physical activity for older persons on a population basis can be complicated, as many older adults may not be able to do the recommended amounts of physical activity due to health conditions or functional limitations. Indicators for such kinds of assessments would need to capture the extent to which older adults are as physically active as their abilities and conditions allow.</p>
Key references	<p>Ferreira M, Kowal P. Minimum data set on ageing in sub-Saharan Africa: Report on a WHO Workshop. Pretoria: World Health Organization; 12 - 14 February 2003 (http://whqlibdoc.who.int/publications/2003/9241591110.pdf, accessed 6 May 2014)</p>
Additional resources	<p><u>International resource</u> WHO (2010). Global recommendations on physical activity for health. Geneva: World Health Organization (http://whqlibdoc.who.int/publications/2010/9789241599979_eng.pdf?ua=1, accessed 6 May 2014)</p>

4. Engagement in life-long learning

Suggested definition	<p>Proportion of older people who were enrolled in education or training, either formal or non-formal, in the past year.</p> <p>Suggested data sources: - Administrative data from city department of education - Enrolment data of private and public education and training institutes</p>
Suggested definition using self-report data	<p>Proportion of older people who report being enrolled in education or training, either formal or non-formal, in the past year.</p> <p>Suggested data sources: - Survey of older residents</p>
Comments	<p>Formal, non-formal and informal education are three different types of education. Formal education refers to education and training courses,</p>

	<p>including workplace training, offered by universities, colleges, schools and other organizations with accreditation. Non-formal education refers to organized and structured education within or outside of education institutes. The difference with formal education activities is that non-formal education does not lead to a qualification. Examples are courses audited, not for credit, at a college or university, library courses or religious learning activities. Informal education activities refer to learning situations at home, at work or during leisure activities, and are neither organized nor structured. The specific types of education activities and time period to be included in this indicator can be determined locally, as appropriate.</p>
Key references	<p>OECD. Recognition of non-formal and informal learning – home [website] (http://www.oecd.org/education/skills-beyond-school/recognitionofnon-formalandinformallearning-home.htm, accessed 7 May 2014).</p> <p>OECD (2007). Terms, concepts and models for analysing the value of recognition programmes. RNFIL- Third Meeting of National Representatives and International Organisations, 2 - 3 October 2007, Vienna, Austria (http://www.oecd.org/education/skills-beyond-school/41834711.pdf, accessed 7 May 2014).</p>
Additional resources	

5. Internet access	
Suggested definition	<p>Proportion of older people living in a household with internet access at home.</p> <p>Suggested data sources: - Demographic data of internet users reported by public and/or private internet providers</p>
Suggested definition using self-report data	<p>Proportion of older people who report having access to internet at home.</p> <p>Suggested data sources: - Survey of older residents</p>
Comments	<p>The use of the Internet as a means of obtaining information and communicating with other users whether for social interaction, to receive services and care (e.g. e-/m-Health), or to perform work and other daily tasks (e.g. shopping) from home, has grown dramatically over the years. While there still may be substantial variability in the degree of reliance on the Internet as an essential information and communication technology among older adults, thus creating a digital divide between generations/age cohorts or geographic areas, it is already an important tool for older adults in many developed countries, and is expected to increasingly become important for successive generations of older adults in other contexts.</p>
Key references	<p>Minister of social development (2007). Positive aging indicators. Wellington: Minister of social development (https://www.msd.govt.nz/documents/about-msd-and-our-work/publications-resources/monitoring/postive-age-indicators/positive-ageing-indicators-2007.pdf, accessed 1 May 2014)</p>
Additional resources	

VII. Limitations of the framework and indicators

Age-friendliness of an urban environment is a complex, dynamic and multi-dimensional concept which is also highly context-dependent. Furthermore, the knowledge and science about it is still in a developing stage – age-friendliness is a moving target. Thus, it does not easily lend itself to standardization of measurement. Given this reality, there are some inevitable limitations to the indicators presented in this document.

First, while the core indicators have been selected to cover key outputs and outcomes of age-friendly city initiatives, reliance on the core set of indicators presented in this document alone will provide a simplistic and potentially inappropriate overview of the complex reality of the determinants of ageing and health in a given city. Careful consideration should be given to adopting and adapting the core indicators, and also supplementing them with additional indicators, in order to obtain an assessment that is most appropriate for the locality of interest.

Secondly, in line with the WHO's original concept of Age-friendly Cities, the core indicators were developed with a focus on the urban context at the local government level, and this may have limited their utility for investigating related issues in suburban and rural contexts, at higher levels of government, or at broader geographic scales (e.g. regional, national).

Thirdly, while efforts were made in the process of developing the core indicators to gather inputs from low- and middle-income regions, much of the currently available information, experiences and expertise (e.g. literature, existing guidelines, good practices, experts) were from high-income countries. This may have resulted in the core indicators being less relevant and appropriate for less resourced settings.

Fourth, the core indicators presented in this guide do not perfectly match or correspond to the eight domains of an Age-Friendly City previously described by WHO (WHO, 2007). However, the original key concepts and principles are still reflected in the core indicators. This was a result of the extensive consultations that were carried out in developing the core indicators, and the priority that was given to developing the indicators in line with current thinking, evidence and practices, while respecting the original concept, rather than strictly adhering to previously established guidance.

Fifth, the operational definitions of several of the core indicators are not strictly standardized and this can lead to variations in measurement and reduced accuracy and comparability. This is largely due to the highly complex and context-dependent nature of the phenomenon being measured, the immature state of the science, and the practical need to allow adaptability of the indicators.

Several of the limitations noted above stem from the fact that this is an evolving field of science and practice. Some of the limitations point to specific topics in need of further research. As such, the contents of this guide, including the indicator framework, the indicators and their definitions, require periodic review and revisions through an iterative process in order to keep the guidance up-to-date and in line with the state of the art, as well as to continuously improve its utility.

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IX. Annex 1: Indicator guide development process

The indicator framework and core indicators presented in this guide are the product of a systematic approach carried out between 2012 and 2014. This involved literature reviews, two expert consultations, several rounds of peer review, and a pilot study (Figure 3).

An extensive literature review was conducted on existing frameworks and research findings about the determinants and processes of health and active ageing within the urban environment. This, as well as an understanding of the WHO Age-friendly Cities and Communities concept, provided the basis for developing the indicator framework presented in this document. The framework also reflects the inputs received from a wide range of experts through individual and group consultations.

The development of the indicators was based on several inputs. First, a comprehensive literature review was conducted on international and national initiatives related to ageing, health and the urban environment to pool relevant indicators. A total of 195 indicators from sixteen initiatives were selected across the original eight domains of the WHO Global Age-friendly City Guide. This master list of indicators provided a starting point for experts to deliberate on what could be proposed as the core indicators for assessing the age-friendliness of cities.

During the first expert consultation in 2012, the expert group short-listed 61 indicators as candidates for the core indicators, suggested modifications to the indicator domains, and also established the criteria for further reducing the list of indicators. The preliminary indicator set was evaluated in a pilot study conducted in 2013 with local government and community representatives from over 40 cities across 15 countries (Table 1). The pilot study generated a ranking of indicators as well as substantial qualitative feedback on the indicators and their definitions. Preliminary results from the pilot study were reviewed during the second expert consultation in 2013, which generated recommendations on refining the indicator framework and core indicator set.

The present document was drafted taking into consideration the cumulative results of the literature reviews, pilot survey, expert consultations and peer review conducted to date. This document also reflects additional inputs obtained through further literature reviews and individual expert consultations that took place after the second consultation meeting. The development of indicators is an iterative process, and the core indicators may be refined in the future, as necessary and appropriate, in light of new scientific evidence or practice guidelines, as well as feedback from the users.

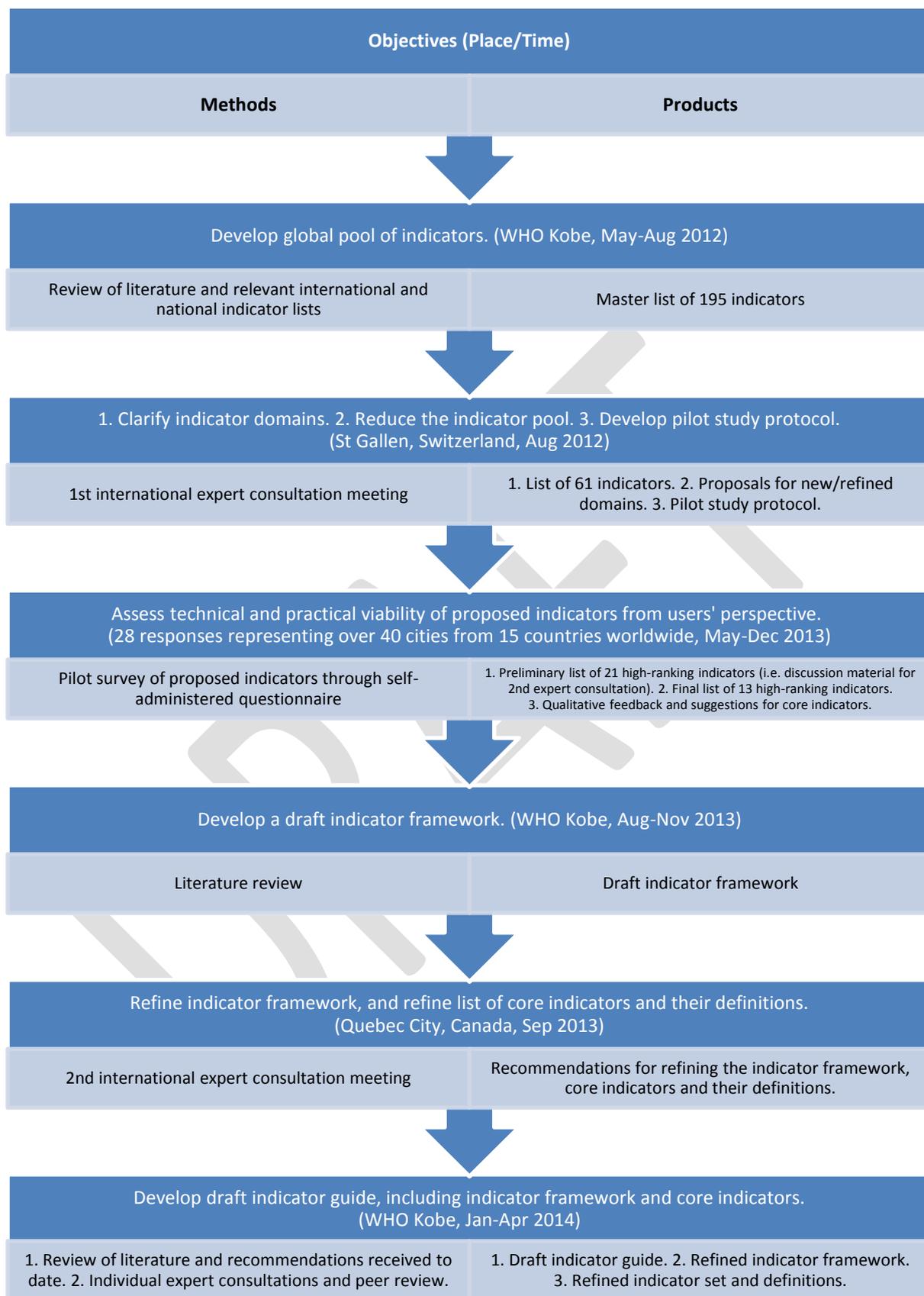


Figure 3. Development process of Age-friendly City indicator framework and core indicators

Table 1. Age-friendly City indicator pilot study participants

Country	City	Institution	Key Partnering Institutions*
Argentina	La Plata	Isalud	
Australia	Melbourne	City of Melbourne	
Canada	Ottawa	City of Ottawa	The Council on Aging of Ottawa
		The Council on Aging of Ottawa	<ul style="list-style-type: none"> • The City of Ottawa • Public Health Agency of Canada
		The International Longevity Centre (Rio de Janeiro, Brazil)	<ul style="list-style-type: none"> • City of Ottawa • The Council on Aging of Ottawa • The International Longevity Centre
	N/A	Public Health Agency of Canada	Canadian Mortgage and Housing Corporation
China	Shanghai	Jing'an District Health Bureau Shanghai	
Costa Rica	San Jose	Hospital Nacional de Geriatria y Gerontología	Consejo Nacional de la Persona Adulta Mayor
France	Besancon	Ville et CCAS de Besancon	
Ireland	Dublin	Dublin Age Friendly City Programme City Council	Dublin City Council
		Ageing Well Network (representing Eastern Dublin)	
		Individual researcher** (representing North Eastern Dublin)	<ul style="list-style-type: none"> • Dundalk Institute of Technology • NUI Maynooth • DCU
		Fingal Local Authority (representing Northern Dublin)	
	Kilkenny	Ageing Well Network	<ul style="list-style-type: none"> • Local Government • Health Service Executive • Law Enforcement
Japan	Akita	City of Akita, Welfare and Health Department, Elderly Welfare Unit	
	N/A	Japan Gerontological Evaluation Study (JAGES)***	Centre for Wellbeing and Society, Nihon Fukushi University (JAGES Secretariat)
Kenya	Nairobi (Korogocho Slum)	African Population and Health Research Center	
Korea	Jeju	Jeju Development Institute	
	Seoul	Seoul Welfare Foundation	
Russia	Tuymazy	Organization of Retired Persons	
Spain	N/A	National Age-friendly City Programme	
Sri Lanka	Wellawaya	Uva Provincial Council	<ul style="list-style-type: none"> • Ministry of Social Services • Ministry of Health
	N/A	World Health Organization, Sri Lanka Country Office	<ul style="list-style-type: none"> • Uva Provincial Council • Ministry of Health • Ministry of Social Services
United Kingdom	Sheffield	Sheffield City Council	
	Manchester	Age-Friendly Manchester, Public Health Manchester, Manchester City Council	<ul style="list-style-type: none"> • University of Manchester • UK Urban Ageing Consortium
United States of America	Bowling Green, Kentucky	City of Bowling Green	<ul style="list-style-type: none"> • Western Kentucky University • City of Bowling Green Neighborhood • AARP Kentucky
	Portland, Oregon	Portland State University - Institute on Aging	<ul style="list-style-type: none"> • City of Portland Bureau of Planning and Sustainability • Multnomah County Aging and Disability Services and Health Divisions • Metro (Portland's regional government) •
	N/A	AARP	

*Key partnering institutions as mentioned by the survey respondent.

**Individual respondents' names are not revealed in order to protect their privacy.

***JAGES provided the collective response of a total of 38 local health officials representing 23 local city/prefectural governments from across Japan.

X. Annex 2: Examples of locally developed indicator sets

The examples that follow are some initiatives that have already taken place in different contexts to develop a set of community indicators for ageing societies. A number of such examples were identified from around the world, but the ones shown here were chosen because they provided clear information about the actual indicators and the method they used for developing them. The examples are presented as an additional resource for crafting a local indicator set, developing operational definitions, and identifying possible data sources.

A. Canada Mortgage and Housing Corporation: community indicators for an aging population

Source: Canada Mortgage and Housing Corporation (2008). Community indicators for an aging population. (www.cmhc-schl.gc.ca/odpub/pdf/66099.pdf, accessed 23 April, 2014).

The Canada Mortgage and Housing Corporation, a crown corporation of the government of Canada, has developed a set of indicators and a checklist in order to help communities to monitor and evaluate the needs and capabilities of older people by identifying characteristics in the social and physical environment that support ageing in place. Ageing in place is the capability of older people to stay in their own home or community as they age, despite changes in health and functional status. The indicators and checklist aid communities in measuring the current situation, identifying targets and goals in order to implement age-friendly interventions, monitoring and evaluating progress, and gauging the extent to which a community's built environment benefits seniors' independence, health, quality of life and well-being. The set of indicators has been based on an extensive literature view, focus groups with seniors, interviews with 30 experts, and a pilot test in two communities. The indicators are categorized according to the following domains: neighbourhood walkability, transportation options, safety, housing choice, access to services and community engagement.

Neighbourhood Walkability	
Indicator	Possible data source
Proportion of housing within walking distance (500 m) of public transportation (could be further categorized by new versus existing housing stock by local government).	- Local planning data
Average distance between pedestrian resting places (for example, benches) along sidewalks.	- Local planning data
Proportion of streets (by kilometre) in the community with sidewalks <ul style="list-style-type: none"> - On both sides - A side on one side - No sidewalks. 	- Local planning data
Sidewalks (by kilometre) that could be defined as in good repair (that is, no badly cracked or broken pavement).	- Local planning data
Average number of walks per day-week-month by residents age 65 + (65 years old or older), categorized by destination, season-length-time of walk)	- Special purpose surveys - Canadian Community Health Survey (2005)
Annual number of pedestrian: 1) injuries and 2) fatalities from accidents with automobiles,	- Canadian Motor Vehicle Traffic Collision Statistics (Transport Canada)

categorized by:	
- Victim's age	
- Season	
- Reason for accident	
Proportion of sidewalks cleared during or after snowfall or freezing rain	- Municipal public works department

Transportation Options	
Indicator	Possible data source
Proportion of residents age 65+ who travel every day, once a week, once a month, or never, categorized by:	- Special purpose survey - 2007 General Social Survey (Statistics Canada) - Local transit authority
- Mode of transportation	
- Destination	
- Season	
Average number of trips taken on public transportation every day, once a week, once a month by residents 65 years old or older	- Focus group with seniors - Special purpose surveys - General Social Survey (Statistics Canada) - Local transit authority
Average number of times per week that residents 65 years old and older report staying at home because of lack of transportation	- Focus group with seniors - Special purpose surveys - General Social Survey (Statistics Canada)

Safety	
Indicator	Possible data source
Proportion of residents age 65+ who report feeling safe/unsafe in their neighbourhood, categorized by:	- Focus group with seniors - Special purpose surveys
- Time of day	
- Location	
- Reason (s) for feeling unsafe.	
Proportion of streets, pedestrian routes (by linear km), bus stops, public places, and retail areas that lack adequate lighting for walking at night	- Local planning data - Special purpose surveys
Annual number of slip and fall injuries on sidewalks and in public spaces, categorized by:	- Canadian Hospital Injury Reporting and Prevention Program (CIRPP) (Public Health Agency of Canada) - Canadian Community Health Survey (2005)
- Season	
- Type of injury	
- Place of fall	
Number of reported street crimes against residents ages 65+, categorized by:	- Crime statistics (Statistics Canada) - Canadian Centre for Justice Statistics - 2008 General Social Survey - Local police
- Type of crime,	
- Location of crime,	
- Time of day.	
Availability of wayfinding systems/safety features at crosswalks (for example, crossing times that allow seniors to cross, clear signage, visible sight lines, audible crossing signals for the visually impaired, safe design)	- Local planning data - Municipal audit sight lines

Housing Choice	
Indicator	Possible data source
Proportion and number of residences in the community categorized by housing type: multi-family home, single-family home, duplex, townhouse, rowhouse, mobile home, FlexHousingTM, garden (granny) flats, accessory dwelling units, and other (could be further categorized by new versus existing housing stock).	<ul style="list-style-type: none"> - Local planning data - CMHC - Census
Occupancy rates at existing lifestyle/retirement/seniors' residences, and supportive housing in the community.	<ul style="list-style-type: none"> - Local planning data - CMHC - Census - Special purpose surveys
Types of tenure available in the community (freehold homeownership, rental, condominium, co-operative housing, co-housing, leaseholds, shared equity ownership, life leases, life tenancies, flexible tenure).	<ul style="list-style-type: none"> - Local planning data - 2008 General Social Survey (Statistics Canada) - Census - Special purpose surveys
Proportion of residents 65 years old or older who spend 30 per cent or more of their before-tax household income on housing.	<ul style="list-style-type: none"> - CMHC - Census
Proportion of residents 65 years old or older living in housing with unmet home modification needs (for example, narrow hallways, unsafe stairs, lack of bathroom grab bars, inadequate lighting).	<ul style="list-style-type: none"> - CMHC data - Special purpose surveys - Advancing the inclusion of people with disabilities (Government of Canada)
Proportion of households living in "acceptable" housing (meeting adequacy, suitability, and affordability standards) in the community, categorized by age cohort.	<ul style="list-style-type: none"> - CMHC data - Special purpose surveys

Access to Services	
Indicator	Possible data source
Proportion of housing within walking distance (500 m) of the following basic services, pharmacy, grocery store, bank, hospital, senior centre and shopping.	<ul style="list-style-type: none"> - General Social Survey (Statistics Canada) - Local planning data
Proportion of housing within walking distance (500 m) or within 10-minute drive by car or public transit trip to the following services: pharmacy, grocery store, bank, hospital, senior centre, retail shopping.	<ul style="list-style-type: none"> - General Social Survey (Statistics Canada) - Local planning data
Proportion of residents 65 years old or older who require assistance from family members or other individuals to access the following services: pharmacy, grocery store, bank, hospital, senior centre, retail shopping, libraries and community halls.	<ul style="list-style-type: none"> - Local planning data - Special purpose surveys - Advancing the inclusion of people with disabilities (Government of Canada)
Proportion of residents 65 years old or older who have access to home delivery of groceries and other retail goods.	

Community engagement	
Indicator	Possible data source
Proportion of residents 65 years old or older who engage in social activities at least once per week. Activities may include: meeting with friends/neighbours, civic, religious or cultural activities, volunteer or part-time work	<ul style="list-style-type: none"> - Focus group with seniors - Special purpose surveys - 2008 General Social Survey (Statistics Canada)
Proportion of residents 65 years old or older who have access from their homes to a dedicated senior centre or other place of interest, such as a library or community centre	<ul style="list-style-type: none"> - Focus group with seniors - Special purpose surveys
The extent to which local government has land use policy and planning programs that specifically engage seniors	<ul style="list-style-type: none"> - Local government - Research on municipal policies

B. The AdvantAge Initiative: 33 Indicators to measure age-friendliness in communities

Source: The Robert Wood Johnson Foundation (2009). Project identifies 33 Indicators that a community is “elderly-friendly”. (<http://www.rwjf.org/en/research-publications/find-rwjf-research/2009/09/project-identifies-33-indicators-that-a-community-is--elder-frie.html>, accessed 23 April 2014)

AdvantAge is an initiative of the independent research organization ‘Center for Home Care Policy and Research’, sponsored by the Visiting Nurse Service of New York. The initiative aims to help local governments in New York prepare for the growing number of older people who are ‘ageing in place’ by providing them with technical support and training in creating liveable communities for all ages. The AdvantAge Initiative has established a list of indicators to measure age-friendliness in communities in order to effectively support independence and well-being as people age. The development of the set of indicators started with an extensive review of literature and existing indicators developed or used by organizations, communities and government to measure the well-being of older people; 14 focus group discussions with older people and community leaders in four cities in order to identify characteristics of age-friendly communities; and eight in-depth interviews with experts to understand features of successful age-friendly community initiatives. This has led to the establishment of four age-friendly community domains that are necessary to support age-friendliness in communities: addressing residents’ basic needs; optimizing physical and mental health and well-being; promoting social and civic engagement; and maximizing independence for the frail and disabled. Based on the four domains, consultants, in cooperation with participating communities, developed a list of indicators. The set of indicators was used in a pilot study involving 10 communities. Phone interviews were conducted with a sample of approximately 500-600 participants in each community. The data obtained from the phone interviews informed the final selection of indicators. The final list of 33 indicators is below:

Basic Needs	
Indicator	Definition
Affordable housing is available to community residents	Percentage of older people who spend more than 30 percent, 30 percent, or less than 30 percent of their income on housing
	Percentage of people age 65+ who want to remain in their current residence and are confident they will be able to afford to do so
Housing is modified to accommodate mobility and safety	Percentage of householders age 65+ in housing units with home modification needs
The neighbourhood is livable and safe	Percentage of people age 65+ who feel safe/unsafe in their neighbourhood
	Percentage of people age 65+ who report few/multiple problems in the neighbourhood
	Percentage of people age 65+ who are satisfied with the neighbourhood as a place to live
People have enough to eat	Percentage of people age 65+ who report cutting the size of or skipping meals due to lack of money
Assistance services are available and residents know how to access them	Percentage of people age 65+ who do not know whom to call if they need information about services in their community
	Percentage of people age 65+ who are aware/unaware of selected services in their community
	Percentage of people age 65+ with adequate assistance in activities of daily living (ADL) and/or instrumental activities of daily living (IADL)

Physical and Mental Health and Well-being	
Indicator	Definition
Community promotes and provides access to necessary and preventive health services	Rates of screening and vaccination for various conditions among people age 65+
	Percentage of people age 65+ who thought they needed the help of a health care professional because they felt depressed or anxious and have not seen one (for those symptoms)
	Percentage of people age 65+ whose physical or mental health interfered with their activities in the past month
	Percentage of people age 65+ who report being in good to excellent health
Opportunities for physical activity are available and used	Percentage of people age 65+ who participate in regular physical exercise
Obstacles to use of necessary medical care are minimized	Percentage of people age 65+ with a usual source of care
	Percentage of people age 65+ who had problems paying for medical care
	Percentage of people age 65+ who had problems paying for prescription drugs

	Percentage of people age 65+ who had problems paying for dental care or eyeglasses
Palliative care services are available and advertised	Percentage of people age 65+ who know whether palliative care services are available

Independence for the Frail and Disabled	
Indicator	Definition
Transportation is accessible and affordable	Percentage of people age 65+ who have access to public transportation
The community service system enables people to live comfortably and safely at home	Percentage of people age 65+ with adequate assistance in activities of daily living (ADL)
	Percentage of people age 65+ with adequate assistance in instrumental activities of daily living (IADL)
Caregivers are mobilized to complement the formal service system	Percentage of people age 65+ who provide help to the frail or disabled
	Percentage of people age 65+ who get respite/relief from their caregiving activity

Social and Civic Engagement	
Indicator	Definition
Residents maintain connections with friends and neighbours	Percentage of people age 65+ who socialized with friends or neighbours in the past week
Civic, cultural, religious and recreational activities include older residents	Percentage of people age 65+ who attended church, temple or other in the past week
	Percentage of people age 65+ who attended movies, sports events, clubs or group events in the past week
	Percentage of people age 65+ who engaged in at least one social, religious or cultural activity in the past week
Opportunities for volunteer work are readily available	Percentage of people age 65+ who participate in volunteer work
Community residents help and trust each other	Percentage of people age 65+ who live in "helping communities"
Appropriate work is available to those who want it	Percentage of people age 65+ who would like to be working for pay

C. Livable community indicators for sustainable ageing in place

Source: MetLife Mature Market Institute & Stanford Center on Longevity. (2013). Livable community indicators for sustainable aging in place. (<http://longevity3.stanford.edu/wp-content/uploads/2013/03/mmi-livable-communities-study.pdf>, accessed 23 April 2014).

The MetLife Mature Market Institute, a research centre of the international insurance company MetLife, in partnership with the Stanford University Center on Longevity (USA), has developed an initial list of indicators in order to help local governments and communities to measure and determine the needs of their ageing population by using readily available data. The report presents an indicator set for liveable community characteristics that have the potential to promote sustainable ageing in place. The indicator list focuses on the characteristics of physical and social environments that have the potential to make communities liveable, promote sustainable ageing-in-

place, and improve the quality of life of everyone. These indicators are the first step to understanding how the social and physical environment can meet the needs and capabilities as people age. Understanding of the complex concept of ageing-in-place has the potential to identify areas needing more attention to ensure quality of life and well-being for older residents. The proposed indicator set is based on an extensive literature review, involving more than 100 research papers, and interviews with 19 ageing-in-place experts with a range of backgrounds, including academia and city planners.

The expert meetings identified three key areas of liveable community characteristics: a) variety of housing options that are accessible and affordable, including accessible/visitable housing, housing options and affordable housing; b) promotion of access to the community, including safe and walkable neighbourhoods, transportation options, safe driving conditions, and emergency preparedness; and c) a wide range of support, services and opportunities to participate in community life, including health care, supportive services, general retail and services, healthy food and social integration.

The proposed set of indicators is based on these three key areas of liveable community characteristics. In addition, the proposed indicator set was established according to the following list of criteria identified during the expert consultation meetings:

- Strength of research evidence
- Strength of support by ageing-in-place experts
- Ability to measure the indicator using existing data sources
- Potential for multiple benefits, such as for the economic and environmental health of the community, or for residents of other age groups
- Degree of adaptability to different types of communities

Housing Options		
Community Characteristic	Indicator	Data Source
Accessible/Visitable Housing	Guidelines/policies encouraging development of accessible and/or visitable housing	City/Town Planning Department
	Presence of home modification services	Area Agency on Aging
Housing Options	Zoning code allows flexible housing arrangements (e.g. accessory dwelling units, home sharing)	City/Town Planning Department
Affordable Housing	Proportion of households headed by someone 65+ that pay less than or equal to 30% annual income on housing	U.S. Census Bureau, American Community Survey
	Property tax rates	City/Town and County Government
	Median home and rental prices	U.S. Census Bureau, American Community Survey

Access to the Community

Community Characteristic	Indicator	Data Source
Transportation options	Presence of public transportation (e.g. bus, light rail, subway)	City/County/Regional Transportation Agency
	Presence of senior transportation (e.g. volunteer-based)	Area Agency on Aging
Walkable neighbourhoods	“Complete Streets” policies (e.g. sidewalks in good condition, frequent and safe pedestrian crossings, median islands, bicycle lanes)	City/Town Planning and Public Works Departments
	Existence of parks and recreation areas	City/Town Parks and Recreation Department
Safe Driving Conditions	Protected left-hand turns (e.g. designated lanes, arrows)	City/Town Public Works Department
	Infrastructure to improve visibility (e.g. road signs that are easy to read, adequate lighting)	City/Town Public Works Department
Safety	Crime rate (property and violent)	City/Town Police Department
Emergency Preparedness	Emergency preparedness plans take into account needs of older residents	City/Council/Regional Emergency Planning Agency

Support and Services		
Community Characteristic	Indicator	Data Source
Health Care	Not designated as a Health Professional Shortage Area	U.S. Department of Health and Human Services, Health Resources and Service Administration
	Presence of hospital, primary care physicians, specialists (e.g. physical therapists, geriatricians)	American Medical Association and American Osteopathic Association
	Presence of preventative health programs (e.g. immunizations, fall prevention)	Area Agency on Aging
Supportive Services	Presence of home- and community-based services (e.g. home health care, meals on wheels, adult day care)	Area Agency on Aging
	Presence of caregiver support services (e.g. respite, support groups)	Area Agency on Aging
General Retail and Services	High Walk Score	Walkscore.com
	Percent of land area zoned for mixed use/retail	City/Town Planning Department
Healthy Food	Not designated as a Food	U.S. Department of Agriculture,

	Desert	Economic Research Service
	Policies supporting creation of local farmers' markets (e.g. providing public land for farmers' markets)	City/Town Planning Department
	Existence of home-delivered and congregate meal programs	Area Agency on Aging
Social Integration	Percent of 65+ who live alone	U.S. Census Bureau, American Community Survey
	Existence of activities and events that promote intergenerational contact	City/Town Parks and Recreation Department, Local Community Center, Area Agency on Aging
Participation in Community Life	Presence of places of worship, community centers, social organizations, libraries, museums, colleges/universities	City/Town Planning Department
	Volunteer opportunities	Corporation for National & Community Services, City/Town Community Services Department

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XI. Annex 3: Annotated bibliography of selected research publications on the methodological aspects of measuring age-friendliness

Below is a small selection of research publications within the last five years which provide technical information on some methodological approaches to measuring the various dimensions of ageing, health and age-friendly environments, from sample selection and study design to data collection tools and statistical analysis techniques.

Chaves, ML, Camozzato, AL , Eizirik, CL, Kaye, J (2009). Predictors of normal and successful aging among urban-dwelling elderly Brazilians. *Journal of Gerontology: Psychological Sciences*. 64B(5): 597–602.

This study examined the correlations between successful ageing and demographic, socio-economic and medical status of healthy older Brazilians living in cities. It provides information concerning data collection, the tools used for data collection, selection and recruitment of participants, and analysis of data.

Flood, MT, Nies, M, Seo, D (2010). Successful aging: selected indicators in a Southern sample. *Home Health Care Management & Practice*. 22(2): 111-115

This study analyzed indicators of “successful ageing” in older people in North and South Carolina, USA. Successful ageing is defined as positively experiencing the physiologic and functional changes when ageing, while having a meaning and purpose in life and being spiritually connected. The paper describes the study design, sample selection, data collection, and instruments to measure successful ageing, creativity and functional performance of older people.

Hilgenkamp, TIM, Bastiaanse, LP, Hermans, H, Penning, C, Van Wijck, R, Evenhuis, HM (2011). Study healthy ageing and intellectual disabilities: Recruitment and design. *Research in Developmental Disabilities*. 32(3): 1097-1106.

This paper provides information concerning the recruitment and organization of a study of adults with intellectual disability about their health status. Recruitment of adults with intellectual disabilities is challenging, since most of them are dependent on the care system, involving informal care givers, such as relatives, and professional care givers. The paper outlines how recruitment can be optimized and provides information on inclusion and exclusion criteria when recruiting a large-scale sample group. A number of tools are presented that can be used in measuring health variables in adults with intellectual disabilities. Aspects of representation and the importance of an adequate informed consent procedure are also discussed. The information may be helpful to local governments and communities in recruiting a sample group for a special purpose survey to capture the needs and perspectives of older adults with intellectual disability living in the community and their care givers.

Paillard-Borg, S, Wang, H, Winblad, B, Fratiglioni, L (2009). Pattern of participation in leisure activities among older people in relation to their health conditions and contextual factors: a survey in a Swedish urban area. *Ageing and Society*. 29(5): 803-821.

This paper describes the pattern of participation in leisure activities in relation to contextual factors and mental and physical health in Swedish older people aged 75 and over. The study shows that

certain contextual and health factors are associated with engagement in leisure activities in older people living in an urban area. The measures of participation in leisure activities, health conditions and relevant contextual factors used in the study are described.

Rantakokko, M, Iwarsson, S, Kauppinen, M, Leinonen, R, Heikkinen, E, Rantanen, T (2010). Quality of life and barriers in the urban outdoor environment in old age. *Journal of the American Geriatrics Society*. 58:2154-2159.

This study examined correlations between perceived barriers in the urban outdoor environment and quality of life in older people who are capable of moving around without assistance, and the effects of fear of moving outdoors and unmet physical activity on this correlation. This study adds to the evidence that the urban outdoor environment is associated with quality of life in older people. The key variables of quality of life, perceived environmental barriers, fear of moving outdoors, and unmet physical activity were based on self-reports of the older people.

Schöllgen, I, Huxhold, O, Tesch-Römer, C (2010). Socioeconomic status and health in the second half of life: findings from the German Ageing Survey. *European Journal of Ageing*. 7(1): 17–28.

This study describes the social inequalities in health in the second half of life using data obtained from the German Aging Survey administered by the government of Germany. Social inequalities were measured based on three indicators: education, income and financial assets. Health was measured in terms of physical, functional and subjective health. This study illustrates one approach for examining social inequalities in the different dimensions of older adult health using survey data.

Shankar, A, McMunn, A, Banks, J, Steptoe, A (2011). Loneliness, social isolation, and behavioral and biological health indicators in older adults. *Health Psychology*. 30(4): 377-385.

This study provides evidence that social isolation and loneliness are associated with certain health behaviors, potentially affecting health in older people. The study used data from the English Longitudinal Study of Ageing, which measured loneliness with the Revised UCLA (University of California, Los Angeles) Loneliness Scale, and assessed social isolation using an index of social isolation. This study provides information on some existing survey instruments that could be useful in measuring important social health indicators, such as loneliness and social isolation.