



# AGING IN PLACE IN THE CAROLINAS

DEMOGRAPHIC HIGHLIGHTS,  
PROGRAMMATIC CHALLENGES  
& OPPORTUNITIES

**JAMES H. JOHNSON JR., PH.D. AND ALLAN PARNELL, PH.D.**  
FRANK HAWKINS KENAN INSTITUTE OF PRIVATE ENTERPRISE

*James B. Duke*

THE DUKE ENDOWMENT



THE UNIVERSITY  
of NORTH CAROLINA  
at CHAPEL HILL

KENAN-FLAGLER  
BUSINESS SCHOOL

# PREFACE

*In February 2012, the Committee on Health Care of the Trustees of The Duke Endowment participated in an annual planning meeting to review topics related to grantmaking. Dr. Jim Johnson, William R. Kenan Jr. Distinguished Professor of Strategy and Entrepreneurship at the University of North Carolina Kenan-Flagler Business School, presented data on demographic trends of the first decade of the new millennium. Population aging was identified as one of the trends that will have an impact on the health, social, economic and political institutions of the Carolinas.*

*In response to the presentation, the Trustees asked staff to explore and develop the topic of aging further. An internal planning committee was convened with representatives from the Endowment's Health Care, Rural Church, and Higher Education program areas, as well as representatives from evaluation and administration. The purpose of the committee was to develop potential opportunities specific to The Duke Endowment's funding programs for the aging population of the Carolinas.*

*During the initial meeting, staff established preliminary guiding principles and examined a ten-year history of Endowment funding specific to the aging population. More than \$10.2 million had already been invested in various responsive grants.*

*As the work group continued to study the topic, it was decided that an authoritative report would help staff and the field better understand the issues related to aging. The planning committee sent an RFP to three consultants for consideration. Dr. Johnson was selected to prepare a white paper to provide a more thorough demographic analysis related to aging in the Carolinas and an analysis of evidence-based programs designed to address the needs of this population.*

*The following report was presented to the Trustees of The Duke Endowment and was used to guide staff recommendations for grantmaking. The report underscores the importance of using data and expert information to better understand the issues, gaps, and best-practices of a particular topic, and to help define the role of philanthropy to achieve the greatest impact.*

*By sharing this information, the Trustees of The Duke Endowment hope that others interested in the aging population will use the information to focus resources and grantmaking on programs that will deliver appropriate services to those in need.*

## TABLE OF CONTENTS

<b>Executive Summary</b>	<b>1</b>
Snapshots of Elderly Demographics in the Carolinas	1
Aging in Place Research and Programming	3
Discussion and Recommendations	4
<b>1.0 A Profile of the Elderly Population in the TDE Footprint</b>	<b>5</b>
1.1 Introduction and Purpose	5
1.2 Definition of TDE Footprint	5
1.3 Findings	6
1.3.1 The TDE footprint was on the leading edge of elderly population change in the U.S. during the first decade of the new millennium.	6
1.3.2 Within the TDE footprint, elderly population growth was uneven—in both relative and absolute terms—between 2000 and 2010.	6
1.3.3 In 2010, the elderly population distribution within the TDE footprint paralleled the elderly population growth trends of the preceding decade.	8
1.3.4 The elderly population in the TDE footprint was predominantly white in 2010.	9
1.3.5 The nonwhite elderly were highly concentrated or segregated within the TDE footprint.	9
1.3.6 Longevity drives elderly population growth in the TDE footprint.	9
1.3.7 The elderly population in the TDE footprint was disproportionately female in 2010.	10
1.3.8 Substantial differences existed in the marital status of elderly men and elderly women in the TDE footprint in 2010.	10
1.3.9 Elderly living arrangements in the TDE footprint were strongly influenced by the sex ratio imbalance between men and women.	12
1.3.10 Work is still common among the elderly in the TDE footprint.	14
1.3.11 Poverty was highly concentrated in the TDE footprint in 2010.	14
1.3.12 Elderly Food Stamps/SNAP recipients were highly concentrated in the TDE footprint in 2010	14
1.3.13 Disabilities were common among the elderly in the TDE footprint in 2010.	14
1.4 Areas of Greatest Need	16
1.4.1 Overlapping Indicators of Need	16
1.4.2 Old Age Dependency Ratios	16
<b>2.0 Aging in Place Research and Programming: Current Status and Future Needs</b>	<b>17</b>
2.1 Introduction and Critical Background	17
2.2 Results	19
2.2.1 Definitions	19
2.2.2 Organizing Framework	20
2.2.3 Person-Centered Research and Interventions	20
2.2.4 Built Environment Centered Research and Activities	26
2.2.5 Assistive Technologies	27
2.2.6 Falls Prevention	29
<b>3.0 Discussion</b>	<b>30</b>
3.1 Critical Reflections	30
3.2 Moving Forward	31
3.2.1 Mobilize Collective Ambition	31
3.2.2 Leverage Intellectual Capital	31
3.2.3 New Venture Creation Laboratory	32
3.2.4 Social Innovation Fund	32
3.2.5 Aging in Place Clearinghouse	32
3.2.6 Succession Planning	32
<b>4.0 Literature Consulted in this Study</b>	<b>34</b>

## LIST OF TABLES

1.	Total and Elderly Population Change, 2000-2010	6
2.	Elderly Share of Net Population Change, 2000-2010	6
3.	Elderly Population Change by County Type, TDE Footprint, 2000-2010	7
4.	Percent Elderly Population by County Type, TDE Footprint, 2010	8
5.	Racial/Ethnic Composition of the Elderly Population, TDE Footprint, 2010	9
6.	Elderly Population Change by Age, TDE Footprint, 2000-2010	10
7.	Distribution of Elderly by Age, TDE Footprint, 2010	10
8.	Gender Composition of Elderly Population by Age, 2010	10
9.	Marital Status of NC & SC Elderly by Gender, 2010	11
10.	Elderly Population Living Alone BY Gender, TDE Footprint, 2010	11
11.	Elderly Population Living Alone by Gender & Type of County, TDE Footprint, 2010	11
12.	Labor Force Status of Elderly Men by Age, TDE Footprint, 2010	13
13.	Labor Force Status of Elderly Women by Age, TDE Footprint, 2010	13
14.	Elderly Educational Attainment by Gender, TDE Footprint, 2010	13
15.	Elderly Population in Poverty, TDE Footprint, 2010	13
16.	Elderly Population in Poverty by County Type, TDE Footprint, 2010	13
17.	Percent of Elderly Population with Disabilities, NC & SC, 2010	15
18.	Overlapping Indicators of Elderly Need for Marion County and Dillon County, South Carolina	15
19.	Old Age Dependency Ratios by County Type, TDE Footprint, 2010	15
20.	Regions and Countries Represented in Literature Review	18
21.	Profile of Elderly in Literature Review	18
22.	Profile of Other Groups Targeted in Literature Review	19
23.	Built Environment Targets	19
24.	Core Values of a Comprehensive Aging in Place Intervention	32

## LIST OF FIGURES

1.	Typology of Counties in The TDE Footprint	5
2.	Absolute and Relative Elderly Population Change, TDE Footprint, 2000-2010	7
3.	Relative Elderly Population Change by County, TDE Footprint, 2000-2010	7
4.	Absolute Elderly Population Change by County, TDE Footprint, 2000-2010	8
5.	Elderly Population Change by County Type, TDE Footprint, 2000-2010	8
6.	Distribution of Elderly Population (65+) by County, TDE Footprint, 2010	8
7.	Distribution of the Non-White Elderly by County, TDE Footprint, 2010	9
8.	Distribution of the Oldest Old (85+) by County, TDE Footprint, 2010	10
9.	Distribution of Widowed Elderly Women by County, TDE Footprint, 2010	11
10.	Elderly Population by Household Type, TDE Footprint, 2010	11
11.	Distribution of Elderly Women Living Alone in the TDE Footprint, 2010	11
12.	Distribution of Elderly Female Householders, No Husband Present, TDE Footprint, 2010	12
13.	Labor Force Status of the Elderly by Gender, TDE Footprint, 2010	13
14.	Distribution of the Elderly Living in Poverty by County, TDE Footprint, 2010	13
15.	Distribution of Food Stamps/SNAP Recipients, TDE Footprint, 2010	15
16.	Elderly Disability Rates by County, TDE Footprint, 2010	15
17.	Overlapping Indicators of Elderly Need by County, TDE Footprint, 2010	15
18.	Old Age Dependency Ratios by County, TDE Footprint, 2010	15
19.	Aging in Place Research Framework	21

# AGING IN PLACE

## AGING IN PLACE IN THE CAROLINAS: DEMOGRAPHIC HIGHLIGHTS AND PROGRAMMATIC CHALLENGES AND OPPORTUNITIES

### Executive Summary

This white paper develops a demographic profile of the elderly population in the Carolinas<sup>1</sup> and presents the results of a literature search which identified both promising initiatives and programmatic gaps where new and innovative efforts are needed to foster and facilitate successful aging in place for seniors. As a launch pad for future discussion around defining The Duke Endowment's (TDE) role in this space moving forward, a concluding section highlights strategies worthy of consideration for promoting successful aging in the Carolinas.

### Snapshots of Elderly Demographics in the Carolinas

Nowhere in the U.S. has elderly population growth been more apparent and impactful than in the Carolinas. The elderly population increased by 28% between 2000 and 2010, outpacing both total and elderly population growth in the nation (9.5% and 10.7%, respectively) and the South (14.3% and 19.7%, respectively) (Table 1).

In 2010, the elderly population of the Carolinas totaled 1.8 million—1.2 million in NC and 631,874 in SC (see Table 1). Geographically, the elderly were more highly concentrated in non-metropolitan (15.5%) than in metropolitan (12.5%) counties. But the opposite was true in terms of absolute numbers: twice as many elderly lived in metropolitan (1.3 million) than in non-metropolitan (600,228) counties (Table 4).

Six counties—two in SC (Horry and Greenville) and four in NC (Wake, Guilford, Forsyth, and Mecklenburg)—accounted for the largest absolute concentrations of elderly—more than 45,000 each—in 2010. Another 22 counties—12 in NC and 10 in SC—had between 20,000 and 44,999 elderly residents in 2010. And between 10,000 and 19,999 elderly resided in 35 counties in the Carolinas—9 in SC and 26 in NC (Figure 6).

Eighty percent of the elderly population in the Carolinas was non-Hispanic white in 2010. Blacks (17.1%), other non-

white ethnic minority groups (2.4%),<sup>2</sup> and Hispanics (1.2%) made up the remaining twenty percent. Across the two states, the nonwhite share of the elderly population was slightly higher in SC (22.5%) than in NC (19.8%). Eighteen counties—10 in SC (Sumter, Williamsburg, Lee, McCormack, Jasper, Hampton, York, Allendale, Lexington, and Richland) and 8 in NC (Warren, Northampton, Bertie, Hertford, Robeson, Halifax, Edgecombe, and Hoke)—had nonwhite elderly population concentrations of 40% or more in 2010 (Figure 7).

Disaggregating the elderly population into three age groups—the young old (65–74), the middle old (75–84), and the oldest old (85+)—revealed that increasing longevity is a core characteristic of the elderly population in the Carolinas.<sup>3</sup> In both NC and SC, the oldest old grew more rapidly (40.1%) than both the young old (32.7%) and the middle old (14.9%) between 2000 and 2010 (Table 6). Constituting 11.7% of all elderly in 2010, the oldest old were highly concentrated in seven counties—two in SC (Charleston and Greenville) and five in NC (Wake, Guilford, Forsyth, Mecklenburg, and Buncombe). Each of these counties had more than 5,500 people who were 85+ years old in 2010. There were also noteworthy concentrations in another 17 counties—nine in NC (New Hanover, Durham, Alamance, Cumberland, Moore, Rowan, Cabarrus, Catawba, and Henderson) and eight in SC (Horry, Beaufort, Richland, Lexington, Aiken, Spartanburg, Anderson, and York)—which had between 2,500 and 5,499 oldest old residents in 2010 (Figure 8).

In 2010, 57.3% of the 1.86 million senior citizens in the Carolinas—56.5% in NC and 58.4% in SC—were female (Table 8). Fifty four percent of the young-old, 59% of the middle old, and 70% of the oldest old in the Carolinas were women in 2010. Given this sex ratio imbalance, elderly women were far less likely to be currently married (41.5% vs. 73.4%) and more likely to be widowed (44.4% vs. 13.3%) than elderly men. In 2010, there were 24 mostly rural counties within the Carolinas—twelve in NC (Washington, Chowan, Hertford, Northampton, Vance, Granville, Duplin, Hoke, Robeson, Bladen, Montgomery and McDowell) and 12 in SC (Chester, Fairfield, Ches-

<sup>1</sup> For the purpose of this white paper, we use the term Carolinas to refer to the two states—North Carolina (NC) and South Carolina (SC)—that make up the TDE footprint.

<sup>2</sup> Includes American Indians and Alaskan Natives, Asians, Native Hawaiians and Pacific Islanders, and individuals of two or more races.

<sup>3</sup> A recent study found that life expectancy among white women with less than a high school education declined for the first time, raising concerns that our overall well-being may be reversing.

terfield, Marlboro, Dillon, Darlington, Lee, Calhoun, Barnwell, Bamberg, Allendale, and Colleton)—where 51% or more of the elderly women were widows (Figure 9).

As a consequence of this state of affairs, two elderly household types stand out in the Carolinas: female headed households with no husband present (9,610 or 10.9%) and householders living alone (254,328 or 28.7%). In SC the incidence of these household types was much higher than in NC (52% vs. 31%) (Figure 10).

In both states, the percentage of elderly women living alone was roughly double the percentage of elderly men who lived alone. More than a quarter of all elderly women living alone were highly concentrated in 12 counties—three in NC (Gates, Hyde, and Hoke) and 9 in SC (Cherokee, Chester, Fairfield, Chesterfield, Marlboro, Dillon, Marion, Bamberg, and Berkeley)—2010 (Figure 11). In another 27 counties in SC and 21 counties in NC, elderly women living alone made up between 20% and 25% of all households in 2010 (Figure 11).

Approximately 11% of all households in the Carolinas—11.9% in NC and 9.5% in SC—were headed by a female with no husband present in 2010. Such households were mainly concentrated in ten SC counties (York, Chester, Lee, Dillon, Williamsburg, Orangeburg, Allendale, Hampton, and Colleton) (Figure 12). Only one NC county had an elderly female householder with no husband present concentration of 15% or higher (Hertford). But a significant number of counties in the Carolinas had female headed householders with no husband present concentrations in the 10% to 14% range in 2010 (Figure 12).

Fifteen percent of all elderly, close to twenty percent of elderly men, and slightly over ten percent of elderly women were still active participants in the labor force in 2010 (Figure 13). Labor force participation rates were 32%, 20%, and 8%, respectively, for 65–69 year old, 70–74 year old, and 75+ year old elderly men in 2010 (Table 12). For elderly women in the Carolinas, the comparable statistics were 23% (65–69 year olds), 12% (70–74 year olds), and 4% (75+ year olds) (Table 13).

In 2010, 186,000 seniors—approximately 11 percent of the elderly population in the Carolinas—had incomes below the poverty level (Table 15). The poverty rate was slightly higher in SC (11.2%) than in NC (10.7%), but in absolute numbers, roughly twice as many seniors in NC (121,000) as in SC (65,000) were poor. Thirteen counties within the Carolinas—seven in NC (Halifax, Gates, Hyde, Greene, Duplin, Bladen, and Robeson) and six in SC (Dillon, Williamsburg, Allendale, Bam-

berg, Aiken, and Fairfield) had elderly poverty rates of 20% or more in 2010. Another 37 counties—23 in NC and 14 in SC had elderly poverty rates in the 15% to 19% range. And sixty counties—16 in SC and 44 in NC—had elderly poverty rates in the 10% to 14% range in 2010 (Figure 14).

There were 138,023 households in the Carolinas where at least one elderly person was a Food Stamps/SNAP recipient in 2010. These households were disproportionately concentrated in nonmetropolitan counties. Four counties—all in NC (Halifax, Nash, Edgecombe, and Robeson)—had Food Stamps/SNAP recipient rates that exceeded 15% of all households. Another ten counties—seven in NC (Columbus, Franklin, Pitt, Wilson, Duplin, Sampson, and Harnett) and three in SC (Orangeburg, Lauren, and Darlington) had Food Stamps/SNAP recipient rates in the 10% to 14% range (Figure 15).

Close to 40 percent of the elderly in NC and SC suffered from one or more aging-related disabilities in 2010 (Table 17). Ambulatory difficulties were the most common type of disability, followed by independent living, hearing, and cognition difficulties. Smaller percentages of the elderly population had vision and self-care difficulties (Table 17).

Data on the incidence of these disabilities—available for only 65 counties in the Carolinas—revealed a highly concentrated pattern of impairments. Twelve counties—eight in NC (Nash, Wilson, Wayne, Robeson, Gaston, Lincoln, Burke, and Rutherford) and four in SC (Florence, Orangeburg, Greenwood, and Pickens) had disability rates of 45% or more. Another eight counties—five in NC (Onslow, Johnston, Wilkes, Caldwell, and Cleveland) and three in SC (Berkeley, Laurens, and Anderson) had disability rates in the 40% to 44% range. And the remaining counties had disability rates in the 25% to 39% range in 2010 (Figure 16).

That the elderly population in the Carolinas, as the foregoing data show, is diverse demographically, socio-economically, and geographically raises questions about appropriate metrics that should be used to make decisions about philanthropic investments to promote successful aging in place. Here we rely on the old age dependency ratio—a measure of the number of senior non-contributors, or dependents, per 100 employed, taxpaying workers in the Carolinas. The higher the dependency ratio the more difficult it is for a local jurisdiction to sustain its fiscal health and economic viability.

In the Carolinas, there were 30 persons 65 or older for every 100 workers between the ages of 18 and 64 in 2010. The



old age dependency ratio was slightly higher in SC (31.2/100) than in NC (28.9/100) (Table 19). The dependency ratios were highest in 18 predominantly rural and mostly economic distressed counties in NC and SC (Figure 18).<sup>4</sup>

### *Aging in Place Research and Programming*

It is well established that the elderly prefer to age in place rather than spend their final years in institutionalized settings such as nursing homes.<sup>5</sup> And recognizing the relative high costs of institutionalized care federal, state, and local governments are implementing policies and key stakeholders in the nonprofit, for profit, and philanthropic sectors are instituting programs and services that are designed to foster and facilitate successful aging in place among the senior population—domestically and internationally.

Research on the challenges and opportunities to promote successful aging in place has been either *person-centered*, focusing on subgroups of older adults, caregivers, or service providers; or *built environment-centered*, targeting specific social systems or ecological structures in need of change. In both domains assistive technologies have been introduced that are designed to promote successful aging in place (Figure 19).

Expressing an overwhelming desire to “remain self-reliant and functionally independent,” elders in the Carolinas identified a range of assistance required to successfully age in place, including exercise facilities and programs, safe places to walk in their communities, and someone to talk to about chronic disease management, tax preparation, estate planning, and reverse mortgages. They also identified the need for assistance with activities of daily living and instrumental activities of daily living as well having someone “to come have a cup of tea and listen.” Rigorous quantitative studies confirm that the probability of health longevity, including cognitive health, is substantially enhanced when the types of assistance identified by elders in the Carolinas are provided to support successful aging in place.

<sup>4</sup>The two exceptions in NC were Moore County and Brunswick County—two amenity rich areas which attracted a higher income elderly population during the first decade of the new millennium.

<sup>5</sup>In a 1992 research report, *Understanding Senior Housing for the 1990s*, AARP found that 84% of senior respondents to a survey agreed with the statement, “What I’d really like to do is stay in my own home and never move,” which was a strong endorsement of aging in place. A 2010 AARP survey found that “nearly 75% of American Ages 45 and older strongly agree that ‘what I’d really like to do is stay in my current residence for as long as possible.’” Other studies have found similar support among the elderly for aging in place.

Elder depressive disorders are a major barrier to successful aging in place, especially in rural communities and among some race/ethnic groups. Depression has been found to be highest among seniors with visual impairment, lower income, little leisure time/physical activity, low neighborhood satisfaction, trouble hearing, arthritis/rheumatoid arthritis, and who were disabled and prone to frequent falling. Therefore, interventions that focus on diagnoses and treatment of sensory impairments and physical activity interventions designed to address elderly strength, balance, and gait issues—matters that undergird frequent falls—might be an effective way to *indirectly* address the elderly depression problem.

A number of promising interventions have been developed to address sensory impairments and promote physical activity among seniors as well as to connect seniors faced with aging in place issues with needed social support and resources. They include the *Senior Exercise Self Efficacy Project*, a NYC-based intervention designed to engage elderly public housing residents in strength training and 30 minutes of moderate intensity exercise daily; *The Elder Right to Sight Collaborative*, a Boston-based initiative founded by an optometrist and an occupational therapist which is designed to engage elders in public housing in seminars about holistic eye care, a visual function risk assessment, and environmental assessments of individual apartments; *The Community Aging in Place: Advancing Better Living for Elders Intervention*, which draws upon the expertise of nurses, occupational therapists, and handy men to address functional limitation and disability issues among older adults; and *The Community Ambassadors Program*, a CA-based initiative that trains volunteer “ambassadors” to perform information and referral services for elders.

There is growing evidence that the physical environment has a central role in health outcomes. Modifications to the home, neighborhood, and broader community environments are central to efforts to support aging in place and community. Senior centers, adult day care centers, and such alternative living arrangements as assisted living facilities and both naturally occurring and planned retirement communities are all part of efforts to modify the built environment to help seniors deal with the challenges and limitations associated with aging.

Both person-centered and built-environment-centered technological innovations have been introduced to facilitate successful aging in place. At the person-level, telecommunications companies have introduced smart shoes and slippers as well as smart pill boxes and prescription bottles with sensors that enable caregivers, medical professionals, and other service

providers to remotely monitor a range of elderly behaviors, including activities of daily living, medication management, and falls prevention, from cellphones and other smart devices.

At the built environment level, technology developers opine about Smart Homes where activities of daily living can be remotely monitored and chronic diseases like hypertension and diabetes can be managed through telemedicine. Home monitoring systems may be especially important in rural areas where geography affects access and costs. But significant hurdles and challenges must be overcome to effectively integrate these new technologies in health delivery systems.

### *Discussion and Recommendations*

The elderly population in the Carolinas is growing more rapidly than at the national level. In response to this rapid growth, a number of state-level programs exist to support aging populations in the Carolinas. But research suggests that information about these programs is not being effectively disseminated to seniors most in need of assistance and services. Moreover, officials in South Carolina acknowledge that, while their focus is on evidenced based preventions programs, “[u]nfortunately, only a small percentage of these interventions have been translated into evidenced based prevention programs that are packaged for implementation in [South Carolina] community settings.”

At the national level, some potentially promising person-centered initiatives do exist. But most of the research on these activities is exploratory and descriptive, relying on small, convenience samples of seniors who are recruited to participate in focus group, face to face, or telephone interviews about their perceptions of and experiences with various types of aging in place initiatives. The limited evidence that exists raises questions about the potential long-term viability and sustainability of these initiatives. And similar weaknesses exist in the built-environment research and interventions.

To fill existing gaps in both research and program implementation, what is needed in this space is a centralized hub for successful aging in place ideas, innovations, and practices. Such an entity should serve five specific but interrelated functions: mobilize collective ambition, leverage intellectual capital, facilitate new venture creation training, foster social innovation, serve as a clearinghouse for information dissemination, and engage in succession planning.



## 1.0 A PROFILE OF THE ELDERLY POPULATION IN THE TDE FOOTPRINT

### 1.1 Introduction and Purpose

Our goal in this research was to identify the major demographic drivers that shaped the size, composition, and geographic distribution of the elderly population (65 and older) in The Duke Endowment (TDE) footprint at the end of the first decade of the new millennium. Toward this end, we conducted an exhaustive review and analysis of published statistics from Census 2010 and Census 2000 as well as the American Community Survey (ACS). From these sources, we examined significant demographic, economic, and health status indicators for the elderly population in the TDE footprint at three geographical scales: the state, by county-type, and at the individual county level. We assessed elderly population change over the 2000-2010 decade and developed a 2010 geo-socio-demographic profile of the elderly population in the TDE footprint. Before presenting our findings, we define the geographic make-up of the TDE footprint and our various units of demographic analysis.

### 1.2 Definition of TDE Footprint

The TDE footprint is made up of two states—North Carolina and South Carolina—and 149 counties—100 in North Carolina and 49 in South Carolina. To provide detailed insights into the geographical distribution of the elderly in TDE footprint, we developed a fourfold typology of the 149 counties that make up the TDE footprint, using a two-step process.

In the first step, we identified counties that make up metropolitan areas and non-metropolitan areas in the two states. Defined by the U.S. Office of Management and Budget (OMB), metropolitan areas contain a core urban area of 50,000 or more population and the surrounding or adjacent counties “that have a high degree of social and economic integration, as measured by commuting to work, with the urban core.” Metropolitan areas are always drawn around county boundaries. Non-metropolitan areas are made up of counties that do not fall within the boundaries of Census Bureau-defined metropolitan areas.

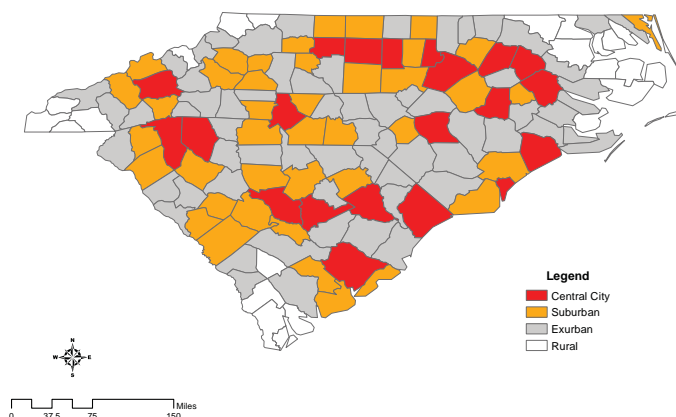
In step two, we subdivided the counties that make up both the metropolitan areas and the non-metropolitan areas in the TDE footprint into two sub-types. The metropolitan areas

were subdivided into central city and suburban counties. Central city counties contain the urban core of the metropolitan area. All of the counties that are socially and economically integrated with the central city or urban core county are defined as suburban counties.

Non-metropolitan areas within the TDE footprint were sub-divided into exurban and rural counties. Located adjacent to one or more metropolitan areas, exurban counties typically are within commuting distance of a major urban core and encompass areas that are most likely to be annexed in the next wave of metropolitan growth and expansion. Rural counties typically are not located within normal commuting distance of a major urban core and therefore are most closely aligned with what the Census Bureau defines as noncore counties.

Based on this typology, the TDE footprint is comprised of 62 metropolitan counties—21 central city and 41 suburban—and 84 non-metropolitan counties—63 exurban and 21 rural. Among North Carolina’s 100 counties, 40 are metropolitan—14 central city and 26 suburban—and 60 are non-metropolitan—43 exurban and 17 rural. Among South Carolina’s 46 counties, 22 are metropolitan—7 central city and 15 suburban—and 24 are non-metropolitan—20 exurban and 4 rural (Figure 1). In Figure 1, central city and suburban counties are color-coded red and orange, respectively. Exurban and rural counties are color-coded yellow and white, respectively.

Figure 1  
 TYPOLOGY OF COUNTIES IN THE TDE FOOTPRINT



Generally speaking, metropolitan and central city counties in particular are far more likely to have world-class health care facilities and other life enhancing resources and innovations than non-metropolitan counties, especially rural or non-core counties. But, as we show below, the size, composition, and geographic distribution, as well as the diverse living arrangements of the elderly in the TDE footprint, create both major challenges and unique opportunities for anyone interested in developing programs to address population aging issues.

### 1.3 Findings

Our mining of census statistics generated a diverse array of tables, graphs, and maps on the elderly population in the TDE footprint. Our main findings are subsumed under thirteen themes, which are discussed below.

#### 1.3.1 The TDE footprint was on the leading edge of elderly population change in the U.S. during the first decade of the new millennium.

Nowhere in the U.S. has elderly population growth been more apparent and impactful than in the TDE geographical footprint—the states of North Carolina and South Carolina. Between 2000 and 2010, the elderly population increased by 28% across these two states, outpacing both total and elderly population growth in the nation (9.5% and 10.7%, respectively) and the South (14.3% and 19.7%, respectively) (Table 1). Moreover, as Table 2 shows, the elderly were far more important

Table 1  
TOTAL AND ELDERLY POPULATION CHANGE,  
2000-2010

Area	2010 Population	Absolute Change	Percent Change
	Total Population		
U.S.	309,050,816	26,884,972	9.5
South	114,555,744	14,318,924	14.3
TDE Footprint	14,160,847	2,099,702	17.4
North Carolina	9,535,483	1,486,170	18.5
South Carolina	4,625,364	613,532	15.3
	Elderly Population		
U.S.	38,749,413	3,737,660	10.7
South	14,893,985	2,455,718	19.7
TDE Footprint	1,865,953	411,572	28.2
North Carolina	1,234,079	265,031	27.3
South Carolina	631,874	146,541	30.2

Table 2  
ELDERLY SHARE OF NET POPULATION CHANGE,  
2000-2010

Area	Total Population Change	Elderly Population Change	Elderly Share of Net Change
United States	26,884,972	3,737,660	13.9%
South Region	14,318,924	2,455,718	17.2%
TDE Footprint	2,099,702	411,572	19.6%
North Carolina	1,486,170	265,031	17.8%
South Carolina	613,532	146,541	23.9%

to total population growth in the TDE footprint (19.6%) than they were to total growth nationally (13.9%) and in the South (17.2%) during the first decade of the new millennium.

#### 1.3.2 Within the TDE footprint, elderly population growth was uneven—in both relative and absolute terms—between 2000 and 2010.

At the most general level, as Figure 2 shows, the rate of elderly population growth between 2000 and 2010 was slightly higher in South Carolina (30.2%) than in North Carolina (27.3%). Among the four types of counties in the TDE footprint, central city (32.4%) and rural counties (31.2%) experienced more rapid elderly population growth than suburban (29.5%) and exurban (20.6%) counties (Table 3). Among the 146 counties that make up the TDE footprint, four—one in South Carolina (Beaufort) and three in North Carolina (Brunswick, Union, and Wake)—experienced elderly growth in the 60-to-90 percent range between 2000 and 2010. Color-coded red on the map in Figure 3, these are for the most part amenity-rich retirement destinations which are near water and/or a wide array of other recreational and cultural resources including golf courses, universities, and world-class health care.

Another 15 counties in the TDE footprint—color-coded orange in Figure 3—experienced elderly population growth rates in the 40%-to-60% range during the first decade of the new millennium. As Figure 3 shows, eight of these counties are in South Carolina (Horry, Macon, Georgetown, Berkeley, Dorchester, Lexington, Lancaster, and York) and seven are in North Carolina (Franklin, Johnston, Chatham, Stokes, Davie, Alexander, and Lincoln).

In contrast to relative growth, absolute elderly population growth within the TDE footprint was significantly greater in North Carolina (265,031) than in South Carolina (145,541) during the first decade of the new millennium (see

Figure 2  
ABSOLUTE AND RELATIVE ELDERLY POPULATION CHANGE, TDE FOOTPRINT, 2000-2010

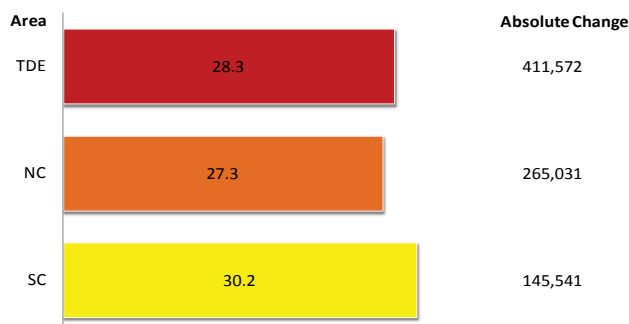


Figure 3  
RELATIVE ELDERLY POPULATION CHANGE BY COUNTY, TDE FOOTPRINT, 2000-2010

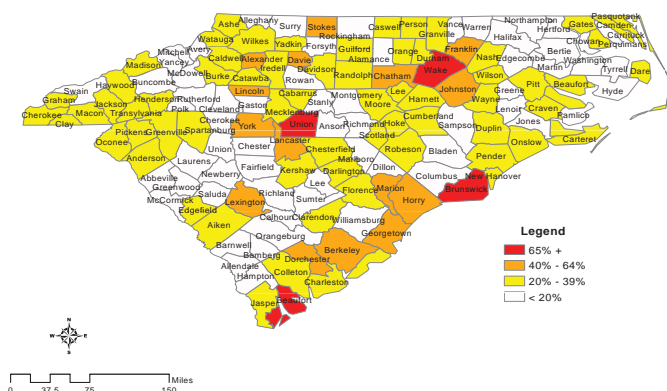


Table 3  
ELDERLY POPULATION CHANGE BY COUNTY TYPE, TDE FOOTPRINT, 2000-2010

County Type	No. of Counties	2010 Population	Absolute Change	Percent Change
All Counties	146	1,865,926	411,572	28.3
Metro Counties	62	1,269,090	301,834	31.2
Central City	21	745,085	182,492	32.4
Suburban	41	524,005	119,342	29.5
Non-metro Counties	84	596,863	109,738	22.5
Exurban	63	480,219	81,992	20.6
Rural	21	116,644	27,746	31.2

Figure 2). Looking across the various county types, metropolitan (301,834)—central city (182,492) and suburban (119,342)—counties experienced significantly greater elderly growth than non-metropolitan (109,738)—exurban (81,992) and rural (27,746)—counties between 2000 and 2010 (see Table 3).

Peering through the lens of individual counties, eight of them—color-coded red and orange on the map in Figure 4—accounted for close to one third (31%) of the net absolute increase in the elderly population in the TDE footprint during this period. Four of these counties are located in North Carolina (Wake, Mecklenburg, Guilford, and Brunswick) and four are located in South Carolina (Horry, Beaufort, Lexington, and Greenville). Another fifteen counties—seven in North Carolina (New Hanover, Johnston, Cumberland, Forsyth, Iredell, Union, and Buncombe) and eight in South Carolina (Anderson, Spartanburg, York, Aiken, Richland, Berkeley, Dorchester, and Charleston)—experienced net absolute elderly growth in the 5,000 to 9,000 range. These fifteen counties—color-coded yellow in Figure 4—accounted for 24% of net elderly population growth in the TDE footprint between 2000 and 2010.

Combined, the 23 red, orange, and yellow color-coded counties in Figure 4 were responsible for 55% of the net elderly population growth in the TDE footprint during the first decade of the new millennium. Nearly all of these are either central city or suburban counties which are components of major metropolitan areas in North Carolina and South Carolina. The one exception is Beaufort County (SC), designated as a rural jurisdiction in our classification, which is home to Hilton Head, a resort community that attracts relatively wealthy retirees, and Parris Island Recruit Depot. Hilton Head and Parris Island make Beaufort County atypical for “rural” counties.

Other rural counties, which are mostly color-coded white in Figure 4, experienced absolute growth on a much smaller scale than the central city and suburban counties in the TDE footprint. In contrast to Beaufort County (SC), which is a migration magnet for seniors, most of the growth in these rural communities as well as the exurban counties (which also are color-coded white in Figure 4) was due primarily to aging in place (as opposed to migration). Though smaller in scale than the elderly population growth in central city and suburban counties, aging in place population growth can be very challenging for these non-metropolitan counties—rural and exurban alike. These counties typically operate under enormous resource constraints and therefore may not be able to offer or provide senior-centric goods and services that promote active

Figure 4

ABSOLUTE ELDERLY POPULATION CHANGE BY COUNTY, TDE FOOTPRINT, 2000–2010

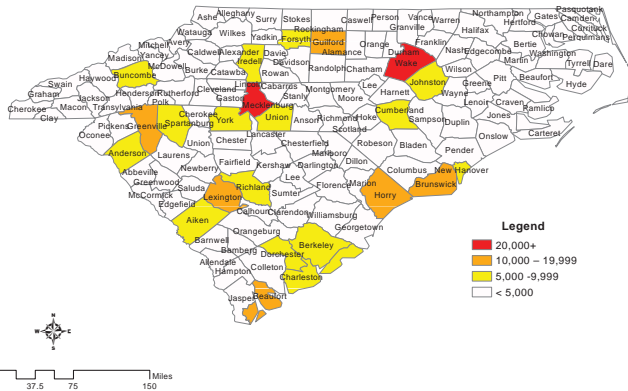


Figure 5

ELDERLY POPULATION CHANGE BY COUNTY TYPE, TDE FOOTPRINT, 2000–2010

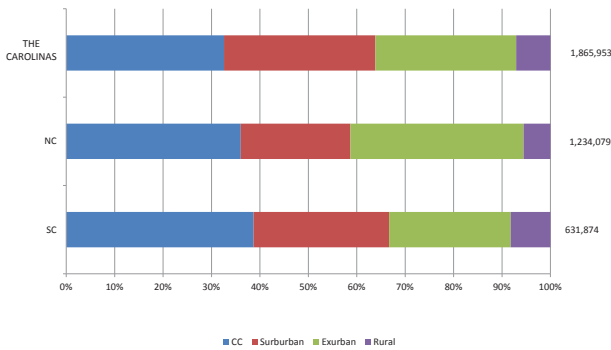


Figure 6

DISTRIBUTION OF ELDERLY POPULATION (65+) BY COUNTY, TDE FOOTPRINT, 2010

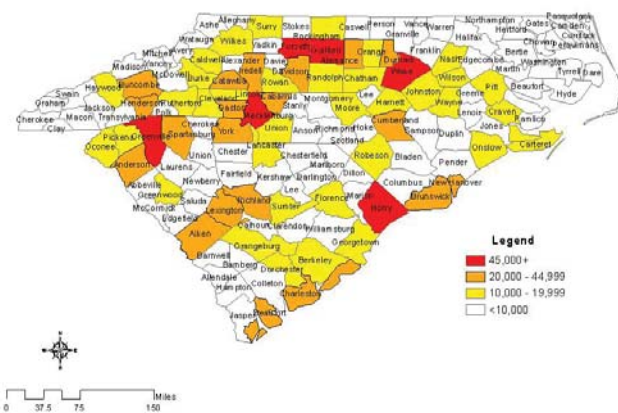


Table 4

PERCENT ELDERLY POPULATION BY COUNTY TYPE, TDE FOOTPRINT, 2010

County Type	Number of Counties	Total Population	Elderly Population	Percent Elderly
All Counties	146	14,160,847	1,865,953	13.2
Metro Counties	62	10,289,812	1,286,525	12.5
Central City	21	6,541,449	745,085	11.4
Suburban	41	3,748,363	515,680	13.6
Non-Metro Counties	84	3,871,035	600,228	15.5
Exurban	63	3,309,158	498,274	15.1
Rural	21	561,877	102,154	18.2

and healthy living.

*1.3.3 In 2010, the elderly population distribution within the TDE footprint paralleled the elderly population growth trends of the preceding decade.*

In 2010, the elderly population of the TDE footprint totaled 1.8 million—1.2 million in North Carolina and 631,874 in South Carolina (see Table 1). Geographically, the elderly were concentrated at higher percentages in non-metropolitan (15.5%)—exurban (15.1%) and rural (18.2%)—counties than in metropolitan (12.5%)—central city (11.4%) and suburban (13.6%)—counties. But the opposite was true in terms of absolute numbers: twice as many elderly lived in metropolitan (1.3 million)—central city (745,000) and suburban (515,680)—counties than in non-metropolitan (600,228)—exurban (498,274) and rural (102,154)—counties (Table 4). Rural and suburban counties accounted for a greater share of the elderly population in South Carolina than in North Carolina in 2010 (Figure 5).

Within the TDE footprint, six counties—two in South Carolina (Horry and Greenville) and four in North Carolina (Wake, Guilford, Forsyth, and Mecklenburg)—accounted for the largest absolute concentrations of elderly. Color-coded red on the map in Figure 6, more than 45,000 elderly resided in each of these counties in 2010. Another 22 counties—12 in North Carolina and 10 in South Carolina—had between 20,000 and 44,999 elderly residents in 2010. These counties are color-coded orange on the map in Figure 6. Between 10,000 and 19,999 elderly resided in the 35 counties color-coded yellow—9 in South Carolina and 26 in North Carolina—on the map in Figure 6.

**1.3.4 The elderly population in the TDE footprint was predominantly white in 2010.**

Eighty percent of the elderly population in the TDE footprint was non-Hispanic white in 2010. Collectively, blacks (17.1%), other non-white ethnic minority groups (2.4%), and Hispanics (1.2%) made up the remaining twenty percent of the elderly population. This distribution varied only slightly across the two states: the nonwhite share of the elderly population was slightly higher in South Carolina (22.5%) than in North Carolina (19.8%). More specifically, it was the black share of the elderly population that was significantly higher in South Carolina (19.8%) than in North Carolina (15.7%) in 2010 (Table 5).

Table 5

RACIAL/ETHNIC COMPOSITION OF THE ELDERLY POPULATION, TDE FOOTPRINT, 2010

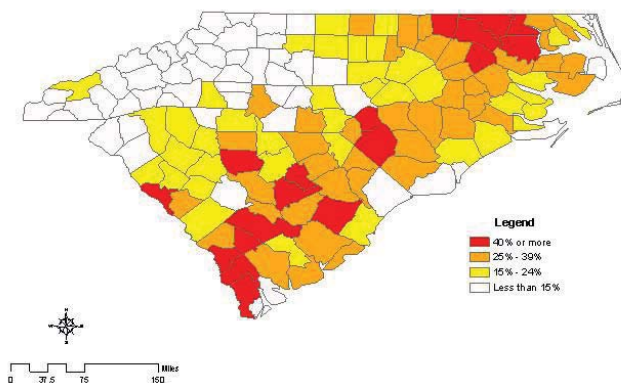
Race/Ethnicity	TDE Footprint (%)	North Carolina (%)	South Carolina (%)
All Races	1,865,953 (100.0%)	1,234,079 (100.0%)	631,874 (100.0%)
White	1,488,281 (79.8%)	996,671 (80.8%)	491,610 (77.8%)
African American	318,811 (17.1%)	193,361 (15.7%)	125,450 (19.9%)
Other *	44,318 (2.4%)	33,887 (2.7%)	10,431 (1.7%)
Hispanic	23,590 (1.3%)	16,989 (1.4%)	6,601 (1.0%)

See footnote 2.

**1.3.5 The nonwhite elderly were highly concentrated or segregated within the TDE footprint.**

In 2010, the minority elderly population in the TDE footprint totaled 377,672. Close to two-thirds of this population lived in North Carolina (237,408) and the remaining one-third in South Carolina (140,264). Blacks made up a majority of the non-white elderly in the TDE footprint (82.4%) and in both of the states—North Carolina (79%) and South Carolina (88%)—that makeup the footprint (see Table 5). At the individual county level, the non-white elderly, as Figure 7 illustrates, were highly concentrated in 18 counties within the TDE footprint—10 in South Carolina (Sumter, Williamsburg, Lee, McCormack, Jasper, Hampton, York, Allendale, Lexington, and Richland) and 8 in North Carolina (Warren, Northampton, Bertie, Hertford, Robeson, Halifax, Edgecombe, and Hoke). In these counties—color-coded red on the map in Figure 7—40% or more of the elderly population was non-white in 2010.

Figure 7  
DISTRIBUTION OF THE NON-WHITE ELDERLY BY COUNTY, TDE FOOTPRINT, 2010



**1.3.6 Longevity drives elderly population growth in the TDE footprint.**

The average 65 year old today will live another 18.7 years to age 83. Disaggregating the elderly population into three age groups—the young old (65–74), the middle old (75–84), and the oldest old (85+)—revealed that increasing longevity is a core characteristic of the elderly population in the TDE footprint.

Between 2000 and 2010, as noted previously, the TDE footprint elderly population increased by 28% (see Table 1). As Table 6 shows, the oldest old grew most rapidly (40.1%), outpacing the growth of not only all elderly (28.3%) but also both the young old (32.7%) and the middle old (14.9%). This trend held true in both the North Carolina and South Carolina components of the TDE footprint.

In part as a consequence of this differential pattern of growth across the age subgroups, the oldest old constituted 11.7% of the elderly population in the TDE footprint in 2010—11.9% in North Carolina and 11.2% in South Carolina (Table 7). In terms of absolute numbers, as Figure 8 shows, the oldest old are highly concentrated in seven counties within the TDE footprint—two in South Carolina (Charleston and Greenville) and five in North Carolina (Wake, Guilford, Forsyth, Mecklenburg, and Buncombe). Each of these counties—color-coded red on the maps in Figure 8—had more than 5,500 people who were 85 + years old in 2010. Another 17 counties, which are color-coded orange on the map in Figure 8, had between 2,500



Table 6  
ELDERLY POPULATION CHANGE BY AGE, TDE FOOTPRINT, 2000–2010

Age	2010 Population	Absolute Change	Percent Change
All Elderly (65+)	1,865,953	411,572	28.3
Young Old (65-74)	1,066,610	262,785	32.7
Middle Old (75-84)	581,165	86,339	14.9
Oldest Old (85+)	218,178	62,448	40.1

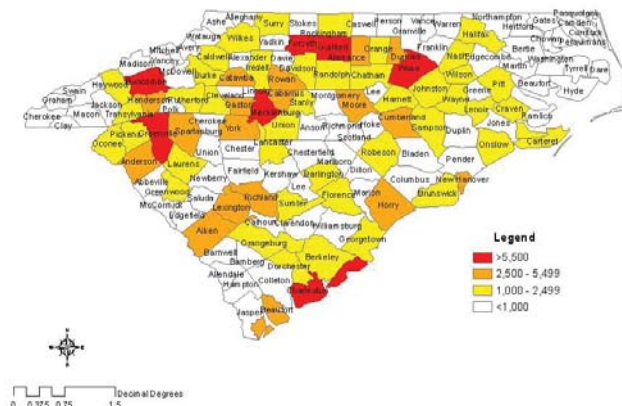
Table 7  
DISTRIBUTION OF ELDERLY BY AGE, TDE FOOTPRINT, 2010

Age	TDE Footprint (%)	North Carolina (%)	South Carolina (%)
All Elderly (65+)	1,865,953 (100%)	1,234,079 (100%)	631,874 (100%)
Young Old (65-74)	1,066,610 (57.2%)	697,567 (56.5%)	369,043 (58.4%)
Middle Old (75-84)	581,165 (31.1%)	389,051 (31.5%)	192,114 (30.4%)
Oldest Old (85+)	218,178 (11.7%)	147,461 (11.9%)	70,717 (11.2%)

Table 8  
GENDER COMPOSITION OF ELDERLY POPULATION BY AGE, 2010

Age	TDE Footprint	North Carolina	South Carolina
All Elderly (65+)	1,865,953	1,234,079	631,874
% Female	57.3	57.5	56.7
Young Old (65-74)	1,066,610	697,567	369,043
% Female	53.8	54.0	53.4
Middle Old (75-84)	581,165	389,051	192,114
% Female	59.0	59.2	58.4
Oldest Old (85+)	218,178	147,461	70,717
% Female	69.9	70.0	69.7

Figure 8  
DISTRIBUTION OF THE OLDEST OLD (85+) BY COUNTY, TDE FOOTPRINT, 2010



and 5,499 oldest old residents in 2010. Nine of these counties are in North Carolina (New Hanover, Durham, Alamance, Cumberland, Moore, Rowan, Cabarrus, Catawba, and Henderson) and eight are in South Carolina (Horry, Beaufort, Richland, Lexington, Aiken, Spartanburg, Anderson, and York).

**1.3.7 The elderly population in the TDE footprint was disproportionately female in 2010.**

Typically, women live longer than men, resulting in a major sex-ratio imbalance in the elderly population. The gender composition of the elderly population in the TDE footprint is no exception. In 2010, as Table 8 shows, 57.3% of the 1.86 million senior citizens in the TDE footprint were female. Similar gender imbalances existed in both the North Carolina (56.5% female) and South Carolina (58.4% female) elderly populations. Moreover, the sex ratio became progressively more out of balance as the elderly population aged. While women constituted 53.8% of the young-old, they made up 59% of the middle-old and 70% of the oldest-old in the TDE footprint in 2010. For the elderly population in both North Carolina and South Carolina, the corresponding percentages for the three age groups were very similar to those for the entire TDE footprint (Table 8).

**1.3.8 Substantial differences existed in the marital status of elderly men and elderly women in the TDE footprint in 2010.**

As Table 9 shows, TDE footprint elderly men were far more likely than elderly women to be currently married (73.4% vs. 41.5%) and less likely to be widowed (13.3% vs. 44.4%) in 2010. In absolute numbers, 447,760 of the elderly women in the TDE footprint—296,559 in North Carolina and 151,201 in South Carolina—were widowed in 2010. The large number of widowed women reflects the fact that life expectancy at every age is significantly shorter for men than for women. In addition to driving the growth of widowed women, earlier deaths among elderly men also sharply reduce the eligible pool of marriageable men for widowed elderly women who may be interested in remarrying.

There were 24 counties within the TDE footprint where 51% or more of the elderly women were widows in 2010. As Figure 9 shows, twelve of these counties are in North Carolina (Washington, Chowan, Hertford, Northampton, Vance, Gran-



Figure 9  
DISTRIBUTION OF WIDOWED ELDERLY WOMEN  
BY COUNTY, TDE FOOTPRINT, 2010

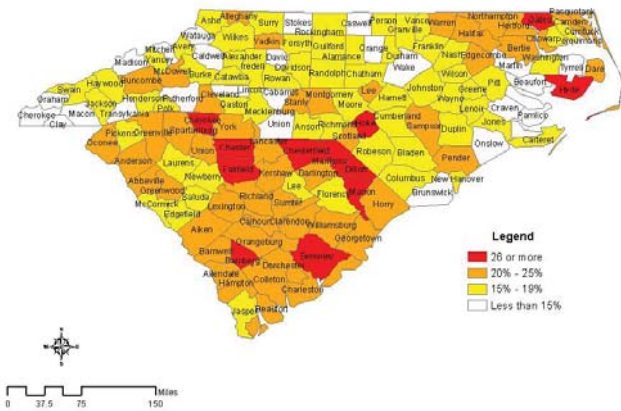


Table 9  
MARTIAL STATUS OF NC & SC ELDERLY BY  
GENDER, 2010

Martial Status	Men	Women
Total—South Carolina	254,894	340,542
Now married	73.2	41.5
Widowed	13.3	44.4
Divorced	8.2	9.0
Separated	1.8	1.4
Never Married	3.5	3.7
Marital Status	Men	Women
Total—North Carolina	490,687	667,075
Now Married	74.1	41.9
Widowed	12.8	43.8
Divorced	8.2	9.7
Separated	1.6	1.1
Never Married	3.3	3.6

Figure 10  
ELDERLY POPULATION BY HOUSEHOLD TYPE, TDE  
FOOTPRINT, 2010

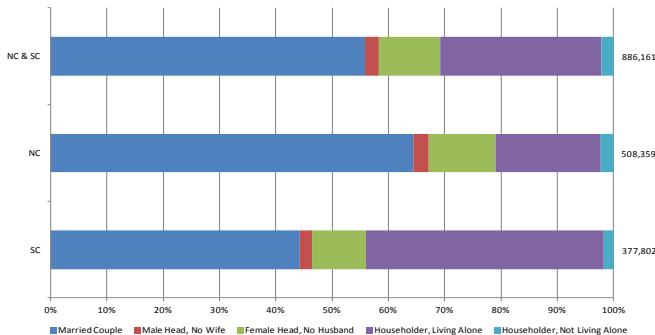


Table 10  
ELDERLY POPULATION LIVING ALONE BY  
GENDER, TDE FOOTPRINT, 2010

Gender	Total Population	Number Living Alone	Percent Living Alone
Both Sexes	1,719,412	485,886	28.3
Male	720,690	127,026	17.6
Female	998,722	358,810	35.9

Figure 11  
DISTRIBUTION OF ELDERLY WOMEN LIVING  
ALONE IN THE TDE FOOTPRINT, 2010

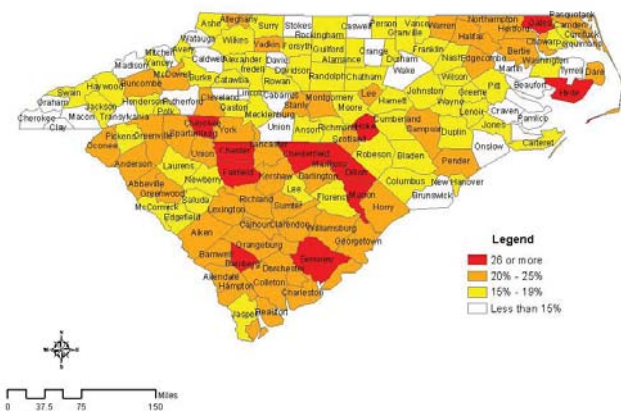


Table 11  
ELDERLY POPULATION LIVING ALONE BY GENDER  
& TYPE OF COUNTY, TDE FOOTPRINT, 2010

Area	No. of Counties	Total Male Householders	Percent Living Alone	Total Female Householders	Percent Living Alone
Total	146	720,690	17.6%	998,722	35.9%
Metro Counties	62	478,837	17.5%	671,062	36.0%
Central City	21	283,602	17.5%	406,118	36.5%
Suburban	41	195,235	17.5%	264,944	35.3%
Non-metro Counties	84	241,853	17.9%	327,660	35.8%
Exurban	63	67,028	18.0%	278,837	35.4%
Rural	21	15,995	17.4%	48,825	36.8%

ville, Duplin, Hoke, Robeson, Bladen, Montgomery and McDowell) and 12 are in South Carolina (Chester, Fairfield, Chesterfield, Marlboro, Dillon, Darlington, Lee, Calhoun, Barnwell, Bamberg, Allendale, and Colleton). These counties tend to be rural and therefore isolated from the more resource-rich counties with supportive services for the elderly.

**1.3.9 Elderly living arrangements in the TDE footprint were strongly influenced by the sex ratio imbalance between men and women.**

At the end of the first decade of the new millennium, two household types stood out among the elderly in the TDE footprint: female headed households with no husband present (9,610 or 10.9%) and householders living alone (254,328 or 28.7%). In 2010, close to 40% of all households in the TDE footprint fell into these two household types—and this was the case across all four county types.

But there were substantial differences in the percentage distribution of these two household types in North Carolina and South Carolina (Figure 10). While 31% of all elderly households in North Carolina fell into one or the other of these two household types, over half of the elderly households in South Carolina (52%) were either female headed with no husband present or a householder living alone in 2010.

The enormous sex ratio imbalance that existed among the elderly population was largely responsible for the preponderance of these two household types in the TDE footprint. As Table 10 shows, for example, more than a third of the elderly women (35.9%) but less than one fifth of the elderly men (17.6%) lived alone in 2010. These statistics, it should be noted, were strongly influenced or weighted by the percentage of householders living alone in South Carolina (40.2%), which was significantly higher than the percentage of elderly households who lived alone in North Carolina (34%) in 2010. Consistently across all county types in both states, as Table 11 shows, the percentage of elderly women living alone was roughly double the percentage of elderly men who lived alone.

Figure 11 depicts the distribution of elderly women living alone by county in the TDE footprint. In 12 counties—three in North Carolina (Gates, Hyde, and Hoke) and 12 in South Carolina (Cherokee, Chester, Fairfield, Chesterfield, Marlboro, Dillon, Marion, Bamberg, and Berkeley)—more than a quarter of the elderly women lived alone in 2010. These counties are

color-coded red on the map in Figure 11. And in 27 counties in South Carolina and 21 counties in North Carolina, which are color-coded orange on the map in Figure 11, elderly women living alone made up between 20% and 25% of all households in 2010.

In 2010, approximately 11% of all households in the TDE footprint—11.9% in North Carolina and 9.5% in South Carolina-- were headed by a female with no husband present. Such households were slightly more highly concentrated in central city (11.1%) and exurban (10.8%) counties than in suburban (9.9%) and rural (9.2%) counties. But, not unlike elderly women living alone, the distribution of elderly female householders with no husband present was highly concentrated within the TDE footprint. Such households were mainly concentrated in ten South Carolina counties (York, Chester, Lee, Dillon, Williamsburg, Orangeburg, Allendale, Hampton, and Colleton), which appear in red on the map in Figure 12. Only one county in North Carolina had an elderly female householder with no husband present concentration of 15% or higher (Hertford). But, as Figure 12 shows, a significant number of counties in North Carolina and South Carolina—color-coded orange on the map in Figure 12—had female headed householders with no husband present concentrations in the 10% to 14% range in 2010.

Figure 12  
DISTRIBUTION OF ELDERLY FEMALE HOUSEHOLDERS, NO HUSBAND PRESENT, TDE FOOTPRINT, 2010

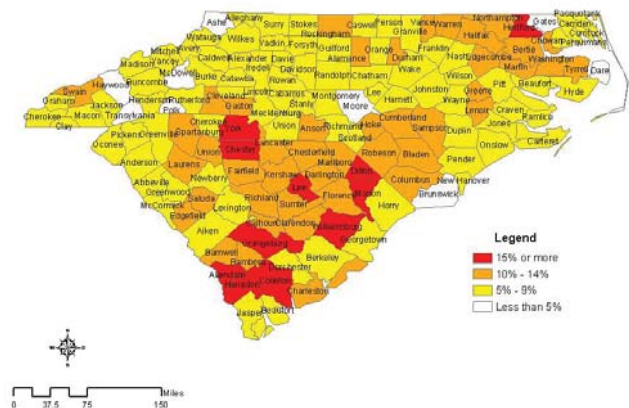


Figure 13  
LABOR FORCE STATUS OF THE ELDERLY BY GENDER, TDE FOOTPRINT, 2010

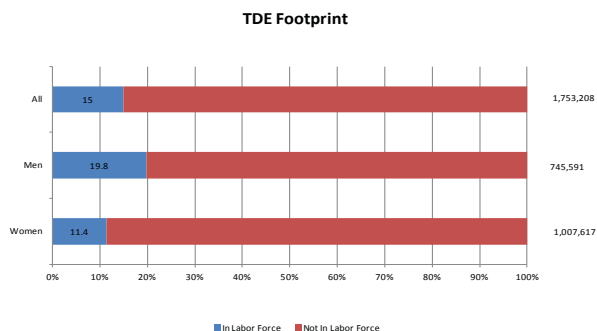


Figure 14  
DISTRIBUTION OF THE ELDERLY LIVING IN POVERTY BY COUNTY, TDE FOOTPRINT, 2010

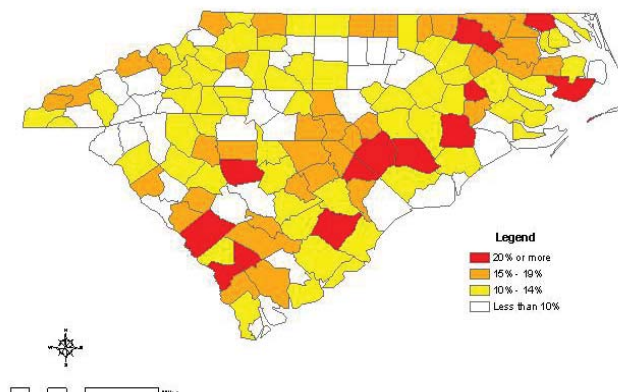


Table 12  
LABOR FORCE STATUS OF ELDERLY MEN BY AGE, TDE FOOTPRINT, 2010

Labor Force Status	65+	65-69	70-74	75+
All Elderly Men	745,591 (100.0%)	263,571 (100.0%)	193,608 (100.0%)	288,412 (100.0%)
In Labor Force	147,597 (19.8%)	84,250 (32.0%)	39,014 (20.2%)	24,333 (8.4%)
Employed	139,396 (18.7%)	79,101 (30.0%)	36,770 (19.0%)	23,525 (8.2%)
Unemployed	8,201 (1.2%)	5,149 (2.0%)	2,190 (1.1%)	808 (0.3%)
Not in Labor Force	597,994 (80.2%)	179,321 (68.0%)	154,594 (79.8%)	264,079 (91.6%)

Table 13  
LABOR FORCE STATUS OF ELDERLY WOMEN BY AGE, TDE FOOTPRINT, 2010

Labor Force Status	65+	65-69	70-74	75+
All Elderly Women	1,017,617 (100.0%)	301,541 (100.0%)	234,584 (100.0%)	481,492 (100.0%)
In Labor Force	114,699 (11.3%)	68,292 (22.6%)	28,998 (12.4%)	17,409 (3.6%)
Employed	107,188 (10.5%)	64,139 (21.3%)	26,590 (11.3%)	16,459 (3.4%)
Unemployed	6,716 (0.7%)	4,158 (1.4%)	1,608 (0.7%)	950 (0.2%)
Not in Labor Force	902,891 (88.7%)	233,222 (77.3%)	105,586 (45.0%)	464,083 (96.4%)

Table 14  
ELDERLY EDUCATIONAL ATTAINMENT BY GENDER, TDE FOOTPRINT, 2010

Educational Attainment	Men	Women
High School Grad or Less	55.0	64.3
Some College	20.3	21.0
College Grad or More	24.7	14.7

Table 15  
ELDERLY POPULATION IN POVERTY, TDE FOOTPRINT, 2010

Area	Total Elderly	Elderly in Poverty	Percent in Poverty
TDE Footprint	1,702,643	185,567	10.9
North Carolina	1,125,580	120,727	10.7
South Carolina	577,063	64,840	11.2

Table 16  
ELDERLY POPULATION IN POVERTY BY COUNTY TYPE, TDE FOOTPRINT, 2010

Area	Number of Counties	Total Elderly Population	Elderly in Poverty	Percent in Poverty
All Counties	146	1,702,643	185,567	10.9
Metro Counties	62	1,135,164	112,428	9.9
Central City	21	677,661	61,698	9.1
Suburban	41	457,503	50,730	11.1
Non-Metro Counties	84	553,414	73,139	13.2
Exurban	63	459,707	62,363	13.6
Rural	21	93,707	10,776	11.5

### ***1.3.10 Work is still common among the elderly in the TDE footprint.***

In 2010, fifteen percent of all elderly, close to twenty percent of elderly men, and slightly over ten percent of elderly women were still active participants in the labor force (Figure 13). Looking across the age spectrum, labor force participation rates were 32%, 20%, and 8%, respectively, for 65–69 year old, 70–74 year old, and 75+ year old elderly men in 2010 (Table 12). For elderly women in the TDE footprint, the comparable statistics were 23% (65–69 year olds), 12% (70–74 year olds), and 4% (75+ year olds) (Table 13).

These labor force participation rates were, in all likelihood, a function of the relatively low levels of educational attainment that characterize the elderly population in the TDE footprint. As Table 14 shows, 55 of elderly men but nearly three quarters of elderly women (64.3%) in the TDE footprint had earned a high school diploma or less. Only one quarter of the elderly men and about 15 percent of elderly women had earned a college degree or more. These gender differences in educational attainment did not vary significantly between the two states. However, within the two states, a high school diploma or less was more common and a college degree or more was less common in non-metropolitan—exurban and rural—counties than in metropolitan—central city and suburban—counties in 2010.

### ***1.3.11 Poverty was highly concentrated in the TDE footprint in 2010.***

In 2010, as Table 15 shows, about 186,000 seniors had incomes below the poverty level—approximately 11 percent of the elderly population in the TDE footprint. The poverty rate was slightly higher in South Carolina (11.2%) than in North Carolina (10.7%), but in absolute numbers, roughly twice as many seniors were poor in North Carolina (121, 000) as in South Carolina (65,000).

With regard to county-type, poverty rates were higher in non-metropolitan counties (13.2%) than in metropolitan counties (9.9%) within the TDE footprint (Table 16). Within metropolitan counties, the poverty rate was higher in suburban counties than in central city counties, but the absolute number in poverty was much higher in the latter (61,698) than the former (50,730). In non-metropolitan counties, both the poverty rate and absolute number of seniors living in poverty were higher in exurban counties (13.6% and 62,363, respectively) than rural

counties (11.5% and 10,776, respectively). It should be noted here, however, that the incidence of poverty among seniors was much higher in North Carolina rural counties (13.3%) than in South Carolina rural counties (8.8%) in 2010.

At the individual county level, as Figure 14 shows, there were 13 counties within the TDE footprint—seven in North Carolina (Halifax, Gates, Hyde, Greene, Duplin, Bladen, and Robeson) and six in South Carolina (Dillon, Williamsburg, Allendale, Bamberg, Aiken, and Fairfield) with elderly poverty rates of 20% or more in 2010. These counties are color-coded in red on the map in Figure 14. Another 37 counties in the TDE footprint—23 in North Carolina and 14 in South Carolina had poverty rates in the 15% to 19% range in 2010. Color-coded in yellow on the map in Figure 14, 60 counties—16 in South Carolina and 44 in North Carolina—had poverty rates in the 10% to 14% range in 2010.

### ***1.3.12 Elderly Food Stamps/SNAP recipients were highly concentrated in the TDE footprint in 2010***

In the pooled 2006–2010 ACS data, there were 138,023 households in the TDE footprint where at least one person age 60 or older was a Food Stamps/SNAP recipient. These households were disproportionately concentrated in nonmetropolitan counties. As Figure 15 shows, four counties—all in North Carolina (Halifax, Nash, Edgecombe, and Robeson)—had Food Stamps/SNAP recipient rates that exceeded 15% of all households. Another ten counties—seven in North Carolina (Columbus, Franklin, Pitt, Wilson, Duplin, Sampson, and Harnett) and three in South Carolina (Orangeburg, Lauren, and Darlington) had Food Stamps/SNAP recipient rates in the 10% to 14% range. In all likelihood, poverty rates would have been substantially higher in these counties (see Figure 14) were it not for some households having access to Food Stamps/SNAP and other social safety net benefits.

### ***1.3.13 Disabilities were common among the elderly in the TDE footprint in 2010.***

Close to 40 percent of the elderly in North Carolina and South Carolina suffered from one or more aging-related disabilities in 2010 (Table 17). Ambulatory difficulties were the most common type of disability, followed by independent living, hearing, and cognition difficulties. Smaller percentages of



Figure 15  
DISTRIBUTION OF FOOD STAMPS/SNAP RECIPIENTS, TDE FOOTPRINT, 2010

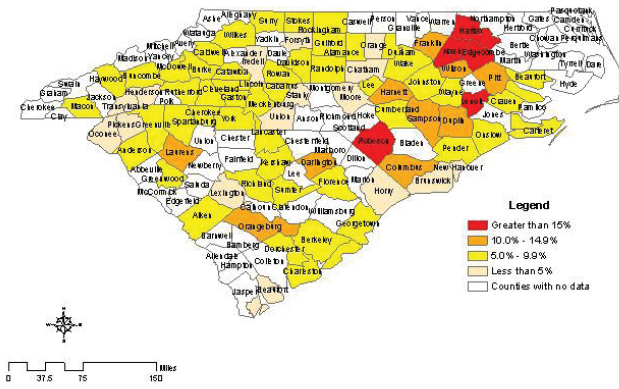


Figure 18  
OLD AGE DEPENDENCY RATIOS BY COUNTY, TDE FOOTPRINT, 2010

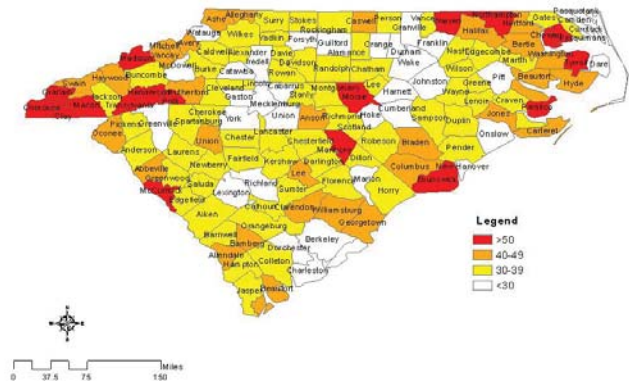


Figure 16  
ELDERLY DISABILITY RATES BY COUNTY, TDE FOOTPRINT, 2010

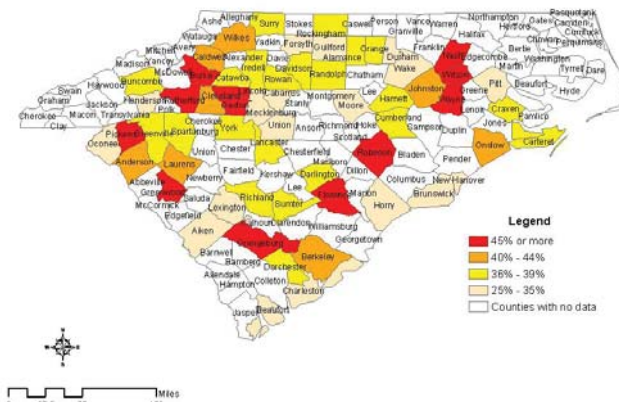


Table 17  
PERCENT OF ELDERLY POPULATION WITH DISABILITIES, NC & SC, 2010

Type of Disability	North Carolina	South Carolina
All Disabilities	38.4	38.4
Hearing	15.8	14.7
Vision	7.9	7.9
Cognition	10.4	11.0
Ambulatory Difficulty	25.6	25.7
Self Care Difficulty	9.2	8.9
Independent Living Difficulty	16.7	16.9

Figure 17  
OVERLAPPING INDICATORS OF ELDERLY NEED BY COUNTY, TDE FOOTPRINT, 2010

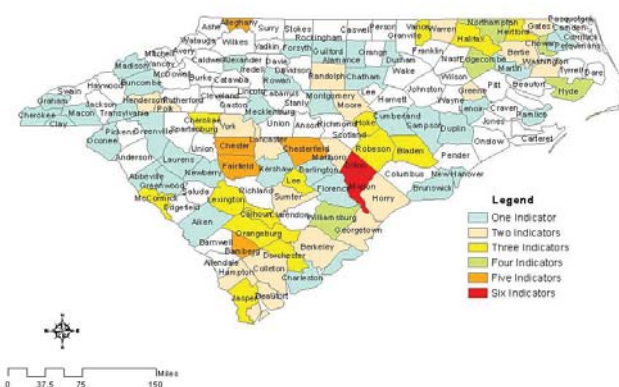


Table 18  
OVERLAPPING INDICATORS OF ELDERLY NEED FOR MARION COUNTY AND DILLON COUNTY, SOUTH CAROLINA

Demographic Indicators	Marion County, SC	Dillon County, SC
Female Household, No Husband Present	18.2%	14.8%
Elderly Population in Poverty )	19.1%	23.7%
Elderly Female Widows	60.5%	55.1%
Elderly Men Living Alone	30.9%	27.6%
Oldest Old (85+)	N/A	N/A
Elderly Women Living Alone )	40.4%	41.3%
Non-white Elderly	N/A	N/A
Total Elderly Living Alone (%)	36.9%	36.4%
Elderly Food Stamp/SNAP Recipients	45.8%	N/A

Table 19  
OLD AGE DEPENDENCY RATIOS BY COUNTY TYPE, TDE FOOTPRINT, 2010

County Type	TDE Footprint	North Carolina	South Carolina
All Counties	30.0	28.9	31.2
Metro Counties	27.0	25.8	29.2
Central City	24.4	22.7	28.5
Suburban	31.6	32.8	30.1
Non-metro Counties	37.9	37.1	40.5
Exurban	36.8	36.0	39.1
Rural	45.4	45.6	45.0

the elderly population had vision and self-care difficulties—as shown in Table 17.

Data were not available on the incidence of disabilities in all 149 counties in the TDE footprint. Figure 16 depicts the distribution of disabilities for the 65 counties for which data were available. It reveals a highly concentrated pattern of disabilities. Twelve counties in the TDE footprint—eight in North Carolina (Nash, Wilson, Wayne, Robeson, Gaston, Lincoln, Burke, and Rutherford) and four in South Carolina (Florence, Orangeburg, Greenwood, and Pickens) had disability rates of 45% or more. These counties are color-coded red on the map in Figure 13. Another eight counties—five in North Carolina (Onslow, Johnston, Wilkes, Caldwell, and Cleveland) and three in South Carolina (Berkeley, Laurens, and Anderson) had disability rates in the 40% to 44% range. They are color-coded in orange on the map in Figure 16. The remaining counties—color-coded yellow and beige in the map in Figure 16—had disability rates in the 25% to 39% range in 2010.

#### **1.4 Areas of Greatest Need**

As the foregoing analysis shows, the elderly population in the TDE footprint is diverse demographically, socio-economically, and geographically, which raises questions about the specific metrics that should be used to make decisions about philanthropic investments to promote successful aging. Two metrics are proposed here: areas of overlapping need or vulnerabilities; and the old age dependency ratio.

##### **1.4.1 Overlapping Indicators of Need**

To hone in on areas of greatest need for philanthropic investments within the TDE footprint, we selected nine of the previously discussed demographic indicators of elderly living arrangements and wellbeing; ranked the top twenty counties within the TDE footprint on each indicator; and then analyzed the nine sets of rankings to identify counties in which there was substantial overlap on the different indicators of elderly wellbeing. The findings are reproduced in Figure 17 and Table 18.

Two counties—Marion and Dillon in South Carolina—had the highest degree of overlap, ranking in the top 20 counties in the TDE footprint on seven and six of the nine indicators, respectively. In Marion County, as Table 18 shows, 18 percent of the elderly households were female headed with no husband

present; 19.1% of the elderly population had incomes below the poverty level; 61 percent of the elderly females were widows; 37% of all elderly, 31% of elderly men, and 40.2% of elderly women lived alone; and 46% of the elderly were Food Stamps/SNAP recipients in 2010. Similarly, in Dillon County, 15% of elderly households were female headed with no husband present; 24% of the elderly population had incomes below the poverty level; 55% of the elderly women were widows; and 36% of all elderly, 28% of elderly men, and 41% of elderly women lived alone in 2010.

As Figure 17 shows, five counties in the TDE footprint—all in South Carolina—had top 20 rankings on 5 out of the nine indicators. Five counties—four in North Carolina (Northampton, Edgecombe, Hyde and Chowan) and one in South Carolina (Williamsburg) had top 20 rankings on 4 out of the nine indicators. Fourteen counties—eight in North Carolina and six in South Carolina—had top 20 rankings on three out of the nine indicators. And 19 counties had top 20 rankings on two out of the nine indicators in 2010. As Figure 17 shows, nine of these counties are in North Carolina and ten are in South Carolina.

##### **1.4.2 Old Age Dependency Ratios**

The old age dependency ratio is a measure of the number of non-contributors, or dependents, per 100 employed, tax-paying workers in the TDE footprint. The higher the dependency ratio the more difficult it is for a local jurisdiction to sustain its fiscal health and economic viability.

In the TDE Footprint, as Table 19 shows, there were 30 persons 65 or older for every 100 workers between the ages of 18 and 64 in 2010. The old age dependency ratio was slightly higher in South Carolina (31.2/100) than in North Carolina (28.9/100). With regard to county-type, the dependency ratios were substantially higher in exurban and rural non-metropolitan counties than in central city and suburban metropolitan counties within both states. At the individual county level, as the map in Figure 18 illustrates, the dependency ratios were highest in 18 predominantly rural and mostly economic distressed counties in North Carolina and South Carolina. The two exceptions in North Carolina were Moore County and Brunswick County—two amenity rich areas which attracted a higher income elderly population during the first decade of the new millennium.



## 2.0 AGING IN PLACE RESEARCH AND PROGRAMMING: CURRENT STATUS AND FUTURE NEEDS

### 2.1 Introduction and Critical Background

The elderly prefer to age in place rather than spend their final years in institutionalized settings such as nursing homes.<sup>6</sup> And recognizing the relative high costs of institutionalized care—a potential train wreck in the making given the fiscal burden of both projected rapid growth and increased life span of the senior population,<sup>7</sup> federal, state, and local governments are implementing policies and key stakeholders in the nonprofit, for profit, and philanthropic sectors are instituting programs and services that are designed to foster and facilitate successful aging in place among the senior population—domestically and internationally.

Below, we present the results of a review of the recent research literature addressing issues of aging in place. Our aim in this literature review was to identify model programs and initiatives as well as gaps in the current aging in place programmatic landscape where new and innovative programming is needed. Our focus in particular was to identify any evidence-based programs that could guide successful program development.

The literature search was conducted by the Office of Research Services and Knowledge Management in the Frank Hawkins Kenan Institute of Private Enterprise at the University of North Carolina at Chapel Hill. Five literature and news databases—ScienceDirect, Academic Search Complete, Web of Science, LexisNexis, and PubMed—were searched, using search terms which included the following:

- “aging in place”, “ageing in place”
- “walkable communities”
- “senior wellness centers”
- Aging and “home modification”
- Aging and “fall prevention”
- Aging and (communities or churches)

<sup>6</sup> In a 1992 research report, *Understanding Senior Housing for the 1990s*, AARP found that 84% of senior respondents to a survey agreed with the statement, “What I’d really like to do is stay in my own home and never move,” which was a strong endorsement of aging in place. Scharlach (2010) reports that a 2010 AARP survey found that “nearly 75% of American Ages 45 and older strongly agree that ‘what I’d really like to do is stay in my current residence for as long as possible.’” Other studies have found similar support among the elderly for aging in place.

<sup>7</sup> Currently, according to Thomas and Blanchard (2009), more than 70 percent of long-term care dollars are spent on skilled nursing facilities or nursing homes. Between now and 2020, they assert, the number of 65 year olds “who will spend some time in a nursing home will double...” (p. 13).

- Other terms based on descriptive text by papers’ authors

The search generated 215 citations which were stored in a RefWorks citation management database.<sup>8</sup> For the purpose of this research, a detailed content analysis of all 215 citations was undertaken.

The search uncovered published research on aging in place across North America, South America, Europe, Asia, and Oceania—as revealed in Table 20. Within the U.S., it identified studies focusing on elderly subgroups and/or initiatives in California (Los Angeles, Fremont, and San Francisco), Wisconsin (Milwaukee), Ohio (Cleveland) Pennsylvania (Pittsburgh and McKeesport), Colorado (Littleton), Michigan (Detroit), New York (Harlem and New York City), Maryland (Baltimore), Washington (Seattle and Kings County), South Carolina (a rural county), Georgia (Atlanta, Mableton, and DeKalb County), Missouri (St. Louis), Florida (Boca Raton), Kansas (rural counties), Texas, Arkansas, and Kentucky as well as Washington, DC.

As Table 21 shows, the search captured studies focusing on aging in place issues for a diverse set of elderly subgroups which varied in terms of age/gender, household/family status, race/ethnicity, immigrant status, health and disability status, economic status, sexual orientation, and community type. In addition to studies that focus on various subgroups of seniors, the search also captured studies focusing on caregivers, service providers, and built environment specialists—as Table 22 illustrates. And, finally, the search uncovered research highlighting aging in place interventions implemented at various geographic scales in the built environment, including the dwelling unit, neighborhood, community, and region (see Table 23).

In the remainder of this paper, we discuss the main findings of this literature review. We begin by discussing the various definitions of aging in place. Next, we present an organizing framework which is used to guide our discussion of the extant literature on aging in place. At the most general level, we focus on person-centered activities and built-environment centered activities. We conclude with a brief summary of the extant literature and a set of recommendations regarding strategic opportunities to further foster and facilitate successful aging in place in the TDE footprint and beyond.

<sup>8</sup> With links to full text when available, the results of the search are accessible at <http://www.refworks.com/refshare2?site=02491114386400000/246041357140038716/221131346801311000>.

Table 20  
 REGIONS AND COUNTRIES  
 REPRESENTED IN LITERATURE REVIEW

Region	Country
North America	United States
	Canada
South America	Brazil
Europe	Belgium
	Finland
	Ireland
	France
	Portugal
	Spain
	The Netherlands
	Czech Republic
	Scotland
	United Kingdom
Asia	Norway
	China
	Taiwan
	Singapore
	Thailand
	Korea
	Japan
	Indonesia
Hong Kong	
Oceania	Australia
	New Zealand

Table 21  
 PROFILE OF ELDERLY IN  
 LITERATURE REVIEW

Demographic Indicator	Targeted Demographic
Age/Gender	Older Men
	Oldest Old
	Young Old
	Very Old
	Older women
	Young active older adults
Household/Family Status	Older Old
	Living with extended family
	Singles living alone
	Very old singles
	Elderly living at home
Race/ethnicity	Home dwelling elderly women
	Nonwhite elderly
	Chinese elderly
	Chinese & Korean seniors
	Haitian older adults
	African American seniors
Immigrant Status	Choctaw Indians
	South Asian immigrants
	Korean immigrants
	Immigrant elderly
Health Status/Disability/Impairment	Thai Elderly
	Healthy elderly
	Seniors with good cognitive functioning
	Single Fallers
	Recurrent fallers
	At risk older adults
	Vulnerable older people
	Frail elderly
	Disabled older adults
	Economic Status
Poor elderly	
Underserved rural elderly	
Low income elderly homeowners	
Low income minority seniors	
Sexual Orientation	Low income elderly
Community Type	Gay, lesbian, & bisexual seniors
	Elderly inner city residents
	Rural seniors/elders
Other	Urban minority older adults
	Senior Center users
	Home-help recipients

## 2.2 Results

### 2.2.1 Definitions

In the extant literature, there are varying definitions of aging in place. Greenfield (2012, p.1) states, for example, that aging in place refers “to being able to remain in one’s current residence even when faced with increasing need for support because of life changes, such as declining health, widowhood, or loss of income.” Similarly, Sixsmith and Sixsmith (2008, p. 219) state that “[t]he basic premise of Ageing in Place is that helping older people to remain living at home fundamentally and positively contributes to an increase in well-being, independence, social participation and healthy ageing.”

But Wiles et al (2011, p. 357) offer a broader or geographically more expansive definition noting that “aging in place [has] meaning beyond mere functional issues later in life, showing how connections are relevant to the neighborhood, the community, various sociocultural contexts, church, and cultural groups; as well as operating on a personal internal level of meaning.” Thomas and Blanchard (2009) concur with this broader

definition. After noting that “our culture has constructed a continuum that positions institutional long-term care at one end of a spectrum, and an idealized vision of aging in place at the other” (i.e., aging in one’s home or dwelling), they go on to note that “People working together can create mutually supportive neighborhoods to enhance well-being and quality of life for older people at home and as integral members of the community.” They refer to this third way as “aging in the community.” Elaborating on this concept, they note further that, whereas aging in place is dwelling-centric, “aging in the community” is social capital-centric—in the sense “that it engages people of all ages and abilities in a shared, ongoing effort to advance the common good” (Thomas and Blanchard, 2009, p. 14).

Perez, et al (2001, p. 175) express a similar view: “The residential area is not restricted to the home but also extends to the environment where it is located (neighborhood) and the people who live there (neighbors), because elderly people’s experience with their neighborhood and neighbors may be just as important as their home itself.” Reflecting on this broader definition, Dye, Willoughby, and Battisto (2011) note that, while “the rural elderly are especially likely to manifest a strong ‘attachment to

Table 22  
PROFILE OF OTHER GROUPS TARGETED IN  
LITERATURE REVIEW

Geographic Target	Literature Review
Caregivers	Formal Informal Paid Unpaid Baby boomer Carers of people with dementia Family
Service Providers	Health care professionals Social workers Community health workers General Practitioners Community Nurses Primary health care managers Allied health care professionals Area Agencies on Aging Senior Center Employees Service coordinators Multidisciplinary team members Pharmacy students/faculty/senior center staff Rural nurses Temporary workers in senior center Volunteer & local Associations
Built Environment Specialists	City Planners Architectural Design & Interior Design Firms

Table 23  
BUILT ENVIRONMENT  
TARGETS

Geographic Target	Interventions
Dwelling	Home modifications Lifelong housing Home design modifications Lifetime home standards Early detection systems Creating supportive housing environments for the elderly
Neighborhood	Neighborhood Retrofit Plans National Neighborhood Networks Neighborhood Design Characteristics Checklist Adult Day Centers Senior Centers as Community Centers
Community	Livable cities City of All Ages Age-prepared communities Elderly-friendly communities Creating resilient communities Walkable & bikeable communities Senior safe zones Environmental modifications beyond the home Complete street ordinances The Village Model NORCs
Region	Regional Integrated Cancer Centers CCCRs without Walls

place' [i.e., their home], an array of factors, including disparities in health, poverty, and access to health care and health resources as well as residence in *senior unfriendly communities* (emphasis added), make aging in place more difficult than for their urban counterparts."

Emphasis on this broader definition is anchored, at least in part, in the recognition, as Sixsmith and Sixsmith (2008, p. 221) point out, that "the everyday lived experience of home is not always a highly positive one in later life." They go on to note that "home can become a virtual prison or a tremendous burden. As people age, often with attendant health and functional capacity declines, managing a home environment can be problematic". More specifically, they note, "Home in old age can be a place of negative experiences, such as isolation and loneliness and there are often significant weaknesses in terms of informal support, physical environment of the home and neighborhood and social network, which undermine the person's ability to live independently." (p. 219).

Given this state of affairs, the frail elderly must be able to draw upon the social capital resources of the broader community and to leverage the diverse array of assistive technologies available in the marketplace today if successful aging in place is to occur (Sixsmith and Sixsmith, 2008). Prior research and empirical data support this assessment. It has been estimated, for example, that "approximately one third of community residing elders face functional limitations that place them at risk for not being able to age in place" (Greenfield, 2012, p. 1). Moreover, as family size decreases and as women's roles in the labor force increase, "there is concern that families are becoming increasingly less able to serve as the 'backbone' of long-term care in the United States" (Greenfield, 2012, p.2).

The disappearance of this type of social capital is an especially acute problem for the near poor elderly "who typically do not qualify for publically funded services, yet for whom the costs of supportive services render them economically vulnerable" (Greenfield, 2012, p. 2). It is also a major problem for seniors who are caregivers for a family member with an intellectual disability who is also aging (Shaw, Cartwright, and Craig, 2011).

Research also points to the fact that many of the other traditional forms of social capital in communities, including civic engagement in local associations and the extent of voluntarism and social trust, are on the decline (Cannuscio, Block, and Kawachi, 2003; Henderson and Caplan, 2008, p. 92; Skinner and Fleuret, 2011). Alternative forms of senior housing, such

as assisted living facilities and planned communities, have been advocated as substitutes for this lost social capital, but it should be noted that these types of living arrangements are financially inaccessible for a large segment of the elderly population (Cannuscio, Block, and Kawachi, 2003).

### 2.2.2 Organizing Framework

Against the backdrop of the broader definition of aging in place described above, two perspectives run through the research literature that together serve as a useful framework for describing the basic and applied research on various subgroups of the elderly around the globe as well as specific programs and initiatives that have been developed to promote successful aging in place. The framework is reproduced in Figure 19.

Research on the challenges and opportunities to promote successful aging in place have either been person-centered, that is, focused on a particular subgroup of older adults, or built environment-centered, that is, targeted at specific social systems or structures in need of change (Greenfield, 2012). As Figure 1 illustrates, the person-centered activities have focused not solely on various subgroups of the elderly but also on caregivers and service providers as well. In both domains assistive technologies have been introduced that are designed to promote successful aging in place (Soar, Swindell, and Tsang, 2011). But, as we show below, successful and widespread diffusion of these assistive technologies will hinge on the extent to which the elderly groups for whom they have been developed are able to acquire the requisite digital literacy in order to use them.

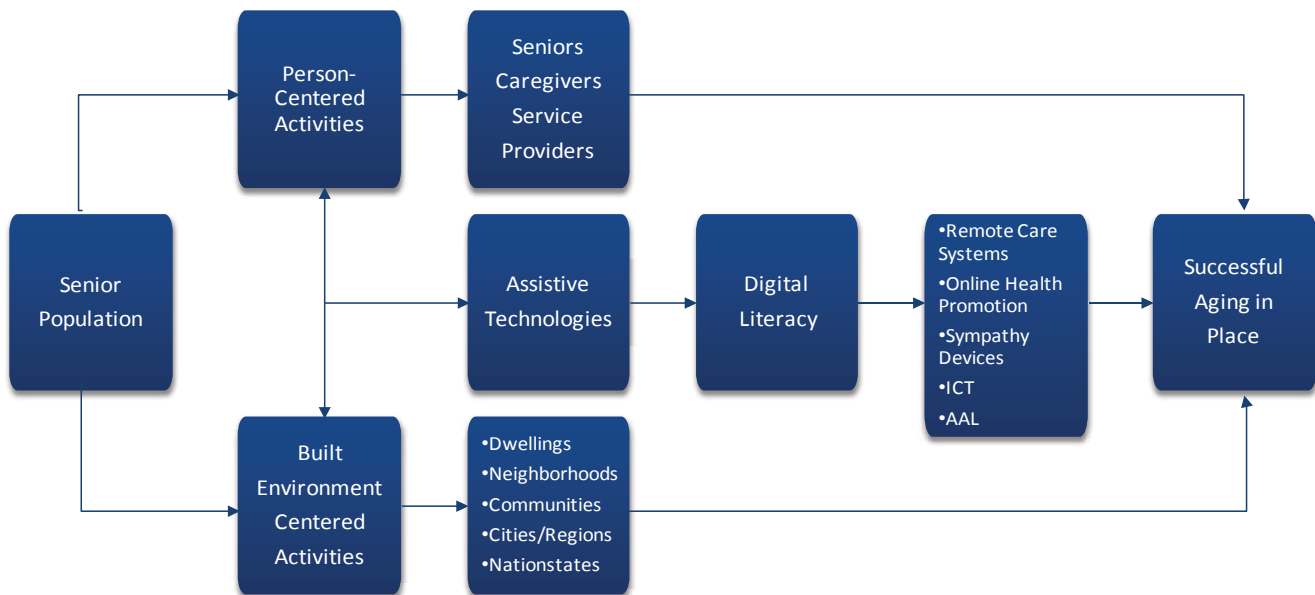
### 2.2.3 Person-Centered Research and Interventions

Our literature search uncovered a number of studies that describe interventions that are designed to facilitate aging in place for seniors with a wide arrange of impairments/disabilities.<sup>9</sup> Here we focus primarily on interventions designed to encourage physical activity among seniors and that address two of the most salient barriers to successful aging in place: visual im-

---

<sup>9</sup> Also uncovered were studies on seniors with pre-existing physical disabilities (Gilson and Netting, 1997), intellectual disabilities (Shaw, Cartwright, and Craig, 2011; Ingvaldsen and Balandin, 2011; Bigby, 2008), and dementia (Morgan, Innes, and Kosteniuk, 2011; Paulo, et al, 2011)). The search also uncovered studies that focus on elder cancer survivors (Fitzpatrick, Edgar, and Holcroft, 2012), seniors with oral health problems (Shelley, et al., 2011), overweight and obese older adults (Clune, et al., 2010), and seniors in need of palliative care (Rolls, et al, 2010).

Figure 19  
AGING IN PLACE RESEARCH FRAMEWORK



pairments (Chu, Kaldenberg, and Huefner, 2009) and depressive disorders (Cabin and Fahs, 2011; Porter, Fischer, and Johnson, 2011; Berke et al, 2007; Engel, et al., 2011). To set the context for the specific interventions to be discussed, we begin with a review of both qualitative and quantitative assessments of what is required to successfully age in place.

### 2.2.3.1 Voices from the Field and the Academy

We identified several studies that solicited input from seniors themselves regarding what was required to successfully age in place, especially in rural communities (Cohen-Mansfield and Frank, 2008; Dye, Willoughby, and Battisto, 2011; Hamblton, Keeling and McKenzie, 2008). Here we focus on the work of Dye, Willoughby, and Battisto (2011), who conducted five focus groups with 39 older adults in a rural county in South Carolina.

Five questions were posed to the focus group participants:

- What do rural elders perceive that they need to stay in their homes as long as they choose?
- What are rural elders' views about how housing, financial resources, and health impacts their ability to stay in their homes?

- What are the main health concerns of the rural elderly?
- What do rural elderly feel they need to have good health?
- What do rural elderly think about the use of local paraprofessionals in helping them get assistance they need to stay at home?

Among the focus group participants, there was an overwhelming desire to “remain self-reliant and functionally independent” (p. 84). Fully recognizing that they would eventually need assistance to age in place, they talked a lot about the “need for healthcare and their concern about affording health care” (p. 85). To address issues like diabetes and hypertension, they talked a lot about the importance of exercise, the need for exercise facilities and programs, the need for a safe place to walk in their communities, and the need to have someone to talk to about the management of chronic diseases, especially diabetes, arthritis, and hypertension. Also, concern was expressed about the ability to afford prescription medications.

Focus group participants also emphasized the need for social support and assistance with activities of daily living and instrumental activities of daily living.<sup>10</sup> They also expressed a need

<sup>10</sup> Similar sentiments were expressed by a group of very old age single-living

for “free/low-cost advice about tax preparation, estate planning, and reverse mortgages” (p. 87).<sup>11</sup> Yet another need that was expressed repeatedly pertained to the “lack of anyone to check on them.” Emblematic of this concern, one focus group participant said, “What you really need is someone to come to have a cup of tea and listen. That is the best thing you can give somebody... come and visit, come and socialize, come and make me feel special even if it is only for a half hour for a cup of tea” (p. 87).

Given the high incidence of elderly widows who live alone in selected counties in South Carolina, this latter concern is understandable. Focus group participants expressed the desire to have volunteers help them address their needs as long as the volunteer was trustworthy and trained on “how to present themselves, how to get involved but not become a factor in the clients’ life...[and] how to access local programs and services.” (p. 88).<sup>12</sup>

Quantitative studies confirm that the probability of health longevity, including cognitive health (Paulo, et al, 2011), is substantially enhanced when the types of assistance identified by the rural South Carolina focus group participants are provided to support aging in place (see Sereny and Gu, 2011; Sarma and Simpson, 2007). When such supports are not provided or available, other studies confirm that elderly people often opt for institutionalized care, notwithstanding their expressed desire to age in place (see Rioux, 2010; Sabia, 2008; also see Perez, et al., 2001).

Two studies are reviewed here that provide critical insights into both the nature of the problem and potential solutions. One focuses on predictors of depression among seniors (Cabin and Fahs, 2011) and the other on factors that influence aging in place decisions by elderly homeowners (Sabia, 2008).

Research confirms that there is a high degree of stigma associated with mental health issues (Zanjani and Rowles, 2012), especially in rural communities and among some race/ethnic groups. As a consequence, depressive disorders are a major barrier to successful aging in place. It has been projected that depressive disorders will likely be among the top three leading contributors of the global burden disease by 2020, up from one

of the top ten in 2001. This rise in the rankings of leading global health problems is likely to occur because depressive disorders “have been associated with multiple other chronic health conditions, including asthma, arthritis, cardiovascular disease, cancer, diabetes, obesity, and myocardial infarction” (Cabin and Fahs, 2011, p. 342). Depressive disorders also have been found to be associated with increases in nursing home placement, burden on caregivers, utilization of medical services, perceptions of poor health, and health care cost. Moreover, prior research suggests that “individual level factors have limited explanatory value alone in predicting depression” (Cabin and Fahs, 2011).

Using data from the Brookdale Demonstration Project Initiative on Healthy Urban Aging (BDI)—a sample of 1,870 enrollees in New York City senior centers, Cabin and Fahs (2011) explored the relationship between individual and neighborhood effects in predicting depression among older Americans. The findings, derived from a stepwise multiple regression analysis with depression scores as the dependent variable and a combination of individual and neighborhood-level characteristics as independent variables, are highly instructive in terms of prospective strategies for dealing with the elderly depression problem.

Eight of the independent variables proved to be statistically significant predictors of depression. Depression was found to be highest among seniors with visual impairment, lower income, little leisure time/physical activity, low neighborhood satisfaction, trouble hearing, arthritis/rheumatoid arthritis, and who were disabled and prone to frequent falling. These findings suggest that interventions that focus on diagnoses and treatment of sensory impairments and physical activity interventions designed to address elderly strength, balance, and gait issues—matters that undergird frequent falls—might be an effective way to indirectly address the depression problem.

Given the sensitive nature of mental health issues (Zanjani and Rowles, 2012), this approach is worthy of serious consideration. Research has documented, for example, a strong association between neighborhood walkability and depressive symptoms among elderly men (Berke et al, 2007). That is, the more walkable the neighborhood, the lower the odds of elderly male depressive symptoms.

In another quantitative study, Sabia (2008) conducted a rigorous statistical analysis of 1972–1992 Panel Study of Income Dynamics (PSID) data to assess the effects of family compositional changes, health conditions, housing characteristics, and local policies and amenities on aging in place decisions by older

---

Swedish people (Fange and Ivanoff, 2007).

<sup>11</sup> For a detailed discussion of the challenges associated with providing seniors with information needed to successfully age in place, see Everingham, et al, 2009; and Jung, et al., 2010).

<sup>12</sup> A qualitative study which explored the perceptions of quality of life among a small group of older people receiving low-level home support in New Zealand yielded similar findings (Hambleton, Keeling, and McKenzie (2008). Similar findings also emanated from a Swedish study of older people with diminished competence (Hammarstrom and Torres (2012).



homeowners. His findings suggest that

Increases in property taxes and utility costs,<sup>13</sup> declining health and functionality, and changes in family composition [e.g., the death of a spouse] are associated with increased mobility of elderly homeowners [i.e., moves to institutionalized care or settings]. Increased home equity, greater financial resources, and stronger neighborhood ties are positively associated with aging in place (p. 4).

Sabia (2008, p. 4) goes on to state that

Taken together, these findings suggest that reduction in user costs of homeownership, through such policy mechanisms as property tax cuts or subsidies for utilities, may increase the likelihood that older homeowners will age in place. Moreover, products and services designed to enhance the functionality of seniors, such as tax credits for home modifications or in-home personal care services, may also facilitate aging in place.

These two quantitative studies highlight both the person-centered and policy domains in which change is necessary to facilitate aging in place. A number of person-centered interventions have been enacted to encourage elders to stay in their homes and communities. Four of them are highlighted below.

### 2.2.3.2 *The Senior Exercise Self Efficacy Project (SESEP)*

Studies have looked at the efficacy of physical activity in promoting healthy aging among seniors in general (Grant 2008; Brandon et al, 2008) and minority older adults in particular (Resnick, Luisi, and Vogel, 2008). After noting that the propensity to engage in physical activity decreases with age, Grant (2008, p. 164) states that

When reflecting on the relationship between ageing and physical activity, it is important to realize that the older sector of the population have lived through a time when exercising for the sake of it or for health reasons was deemed unnatural.

Grant continues by noting that

For much of the 20th century the emphasis later in life was on passivity and contemplation, with rest being considered the virtue of old age. It was legitimate for older people to take a well-earned rest and opt for a passive lifestyle (p. 164).

Given this state of affairs, Grant (2008, p. 164–165) concludes that “[t]rying to sell physical activity to the older population solely on the basis of quality of life, quantity of life, or even salvation is likely to be a lost cause.” She also states that “. . . we also must recognize that accessibility and availability of facilities and resources by itself is insufficient” (p. 172). According to Grant (2008, p. 172), “Any health promotion strategy aimed at increasing the levels of physical activity among the older population must extend well beyond the individual and embrace opportunities in supportive environments.”

Against this backdrop, Resnick, Luisi, and Vogel (2008) drew on the major tenets of self-efficacy theory to test an intervention that was designed to address specific barriers to exercise among a group of minority older adults living in New York City public housing developments. The intervention, the Senior Exercise Self-Efficacy Project (SESEP), was delivered through the New York City Department of Health and Mental Hygiene Wellness at Work Program. The goal, according to the authors, was “to have participants engage in the recommended 30 min daily of moderate-intensity exercise, defined as activity that expends about 150–200 kcal over 30–45 min, or is similar to a brisk 30–45 minute walk.” There was also a strength training component of the program.

Consistent with the major tenets of self-efficacy theory, program participants reportedly “. . . had the opportunity to engage in classes that involved exercise, learn about the benefits of exercise and physical activity, receive verbal encouragement with goal development, and discuss the unpleasant sensation as-

<sup>13</sup> This is a very serious problem in rural counties in North Carolina where the costs of utilities have skyrocketed as a consequence of plant closures by manufacturing firms that are large users of electricity and water. With loss revenues as a consequence of these plant closures, local jurisdictions are now passing the infrastructure investment costs to service commercial customers on to residential customers—most of whom are elderly and low-income.

sociated with exercise and learn how to eliminate these unpleasant sensations (e.g., the pain and fear of falling) (p. 223).

The twice weekly workouts were administered by a middle-aged lay exercise instructor who, along with other older adult class participants, provided positive verbal reinforcement to the program participants.

With an average participation rate of 77% across the six intervention sites, the SESEP intervention reportedly resulted in a significant increase in “participants’ outcome expectations for exercise, an increase in the amount of time spent on exercise, a decrease in the number of depression symptoms, and a trend toward a more rapid chair rise time (i.e., the amount of time it take to stand up from a chair with a level near 0.42 m from the floor without using the arms).

Based on these findings, the authors concluded that, consistent with self-efficacy theory, it is indeed possible to teach minority older adults the benefits of exercise and overall physical activity, to explicitly link clinical improvements in blood pressure to physical activity, to set specific activity goals for the individual, and to provide ongoing verbal encouragement to engage in physical activity. They note further that this intervention can be easily replicated by lay health trainers in other housing sites, senior centers, assisted living or continuing care retirement communities (p. 230). Similar results were found in a physical activity intervention among congregate meal participants in senior centers in Georgia (see Porter, Fischer, and Johnson, 2011).

### ***2.2.3.3 The Elder Right to Sight Collaborative (ERTS)***

Research indicates that “[f]our of the 5 major causes of blindness are directly related to the aging process: age-related macular degeneration (AMD), diabetic retinopathy, glaucoma, and cataracts” (Chu, Kaldenberg, and Huefner, 2009, p. 651). As a consequence, seniors are the most vulnerable population for sight loss, which can have a dramatic impact on independence and the ability to age in place. Decreased visual acuity, loss in vision field, low contrast sensitivity, and other visual impairments have been linked to “disability, falls, difficulty in mobility, difficulty in climbing stairs, difficulty driving, restriction in activities in daily living, social isolation, loss of independence, depression, suicide, and mortality.” Yet, many seniors, according to Chu, Kaldenberg, and Huefner (2009, p. 651) do not “seek the medical resources to correct their visual loss or seek home modifications to deal with difficulties they face in their homes.”

Concerns about the lack of vision services in public housing in Boston led to the creation of The Elder’s Right to Sight Collaborative (ERTS)—an initiative founded by an optometrist (OD) and an occupational therapist (OT) and jointly developed by the New England Eye Institute, Boston Housing Authority, Massachusetts Housing, MAB Community Services, and Boston University as “a sustainable model of eye care for older adults” (Chu, Kaldenberg, and Huefner, 2009, p. 652).

Launched with funding from private and nonprofit sources, ERTS is rooted in “Community Visioning Seminars” which are led by either an optometrist and an occupational therapist or occasionally an OD or OT student with an eye toward engaging elders in public housing in the Boston area in a discussion about a holistic approach to eye care. The seminars typically involve the following components (Chu, Kaldenberg, and Huefner, 2009, p. 653):

- A short discussion led by ERTS staff addressing eye conditions, rehabilitation services, and the importance of lighting for visual function.
- Administration of a Visual Function Risk Assessment (FRA) to interested participants.
- Provision of a vision aid kit consisting of simple solutions to everyday tasks often difficult for individuals with visual impairment, including large-print check registers, 20/20 pens, writing guides, light bulbs, and lens cleaning cloths.
- Environmental assessments of individual apartments.<sup>14</sup>

Between 2004 and 2006, ERTS reportedly provided educational programming at 36 different sites in the Greater Boston Area with 1,377 older adult residents—roughly 44% of the program eligible population—participating in the community visioning seminars. Roughly 16% of the program participants (352 individuals) participated in the visual function risk assessment and 63% of them failed the assessment. Those who failed were counseled to contact an eye care professional for a comprehensive visual health exam. Environmental assessments were completed in 36 apartments. The assessment revealed that “these older adults currently live with lighting conditions significantly below recommended levels” (p. 654).

<sup>14</sup> The authors state that the environmental assessment of individual apartments enabled the ERTS to examine older adults’ daily functions in their own home environment. Lighting measurements (in lux) were taken in each room and at the participant’s “reading area.” Task lighting was also noted as was the accessibility of the apartment. The environmental assessment yielded simple recommendations that could enhance each older adult’s functional independence. Common recommendations made to individuals including reducing clutter, changing the placement of lights, using sheer curtains to cut down glare, and using task lighting when reading or engaging in fine motor task” (p. 653).

Despite modest participation in various facets of the intervention, the authors conclude that “Senior housing is an ideal portal to deliver ERTS type services because there is a natural community in which a direct impact can occur by developing trust and demonstrating how visual impairments affect daily life.” (p. 654).

#### **2.2.3.4 The Community Ambassadors Program for Seniors (CAPS)**

CAPS is a Fremont, CA-based program which “trains volunteer ‘ambassadors’ from several ethnic and faith communities to perform information and referral services for elders, particularly immigrants” (Blair, 2012, p. 1769). Recruited from twelve different community organizations in the Tri-City area of Fremont, Newark, and Union City, CA, CAPS volunteers are trained to provide basic counseling services and to help seniors navigate the government bureaucracy to secure needed support services that will help them to age in place.<sup>15</sup> Because immigrants with both language barriers and acculturation challenges make up a significant portion of the Tri-City area elderly population, most the CAPS volunteers are bilingual and bicultural. Once trained, the CAPS ambassadors reportedly “make themselves available to local seniors through social networking, announcements at community centers, and advertising in ethnic media (Blair, 2012, p. 1771). With regard to specific roles and responsibilities, the CAPS volunteers essentially operate as “community health workers” (CHW).<sup>16</sup>

In a recently published paper, Blair (2012) presents the results of a qualitative assessment the CAPS ambassadors as community health workers or advocates for elders in Tri-City Area of northern CA. He targeted in the assessment a subset of 23 ambassadors from three South Asian community organizations and was able to secure interviews from 20 of them. Through

<sup>15</sup> According to Blair (2012, p. 1771), “CAPS trains volunteers in a 40-h curriculum, developed locally through collaborations with multiple social service agencies and community organizations, to cover a wide range of social services.”

<sup>16</sup> The Community Health Workers Section of the American Public Health Association, as Blair (2012, p. 1770) reports, has produced a comprehensive definition of a CHW:

*A frontline public health worker who is a trusted member of and/or has an unusually close understanding of the community served. This trusting relationship enables the CHW to serve as a liaison/link/intermediary between health/social services and the community to facilitate access to services and improve the quality and cultural competence of service delivery.*

*A CHW also builds individual and community capacity by increasing health knowledge and self-sufficiency through a range of activities such as outreach, community education, informal counseling, social support, and advocacy.*

Blair (2012) notes that such volunteers have been variously referred to as “lay health professionals,” “promotoras,” “cultural brokers,” and “natural helpers” (p. 1771).

semi-structured interviews, he found that the ambassadors hours of service were highly variable, ranging from a few hours per month to more than forty hours per week. With regard to their roles, he characterized the ambassadors as surrogate kinship or co-caregivers, performing the duties of family members when elders’ adult children were too busy to help. Blair quotes one ambassador as stating, “if their children are too busy, I am ready.” He quotes another who stated: “When seniors come to us...it means ...they are not getting help from their own children” (p. 1773).

Through these and other concrete examples Blair (2012) paints a detailed picture of how these CAPS ambassadors serve as effective “conduits” and “guides” to help a group of mostly immigrant elders with language barriers as well as cultural and familial challenges gain access to needed support services that allowed them to remain in their homes and community. By linking elderly with needed services, Blair concludes that the CAPS program also substantially reduced caregiver stress.

#### **2.2.3.5 The Community Aging in Place: Advancing Better Living for Elders Intervention (CAPABLE)**

CAPABLE is an inter-professional intervention which draws upon the expertise of nurses, occupational therapists, and handymen to address functional limitation and disability issues among older adults, with an eye toward facilitating aging in place and decreasing admissions to nursing homes. CAPABLE targets elderly individuals with a least 1 basic activity of daily living limitation or 2 instrumental ADL (IADL) limitations and trains nurses and OTs to identify and remove barriers to daily functioning from the lives of these individuals. CAPABLE is a six month intervention that involves a series of 10 home visits by the intervention team. During the first two visits, the OT meets with the client “to identify and prioritize physical performance problem areas and environmental issues [in the home], such as the lack of a stairway railing or bathroom handrail” (p. 4). In between the first and second OT visit, the CAPABLE intervention team RN visits the client to assess “medical issues that affect daily functioning such as pain, depression, strength and balance, medication management, and poor communication with the primary care provider” (p. 4) and to develop a plan to address these issues, including a home-based exercise plan.<sup>17</sup> Standard CAPABLE protocols are used in both the OT and RN assessments. The handyman “provides modifications

<sup>17</sup> Typically, low impact exercises such as tai chi, which has been shown to improve balance and prevent falls, are part of the customized exercise regime.

and repairs to the home, as directed by the OT” (p. 4).<sup>18</sup> The intervention includes services that reportedly “could be ordered through Medicare Part B, an Accountable Care Organization could elect to cover, or states could order to decrease the Medicaid budget by decreasing admission to nursing homes” (Pho, et al, in press, p. 1).

#### **2.2.4 Built Environment Centered Research and Activities**

There is growing evidence that the physical environment has a central role in health outcomes. Modifications to the home, neighborhood, and broader community environments are central to efforts to support aging in place and community. Senior centers, adult day care centers, and such alternative living arrangements as assisted living facilities and both naturally occurring and planned communities are all part of efforts to modify the built environment to help seniors deal with the challenges and limitations associated with aging.

##### **2.2.4.1 Home Modifications**

Considerable attention has been devoted to the role of home modification in successful aging in place. Most of it centers on home modification as a strategy to prevent senior falls-related injuries, which often require extended stays in hospitals, rehabilitation facilities, and nursing homes, and deaths. Given this established link in the research literature, state and local governments make concerted efforts to avail seniors in their communities about available home modification resources and services. In South Carolina, for example, the Lieutenant Governor’s Office on Aging website contains links to a range of senior services including home modification contractors and home care assistance. In North Carolina, the state’s Division for Aging and Adult Services has a “Home Improvement” link on its website, which provides information for all counties on Community Development Block Grant (CDBG) programs for home modifications for low income residents and host of other programs (including weatherization programs, USDA programs, property tax relief programs, urgent repair programs, and HUD-administered programs).

Universal or barrier free design is another thread that runs through aging in place literature. Universal design focuses on systematic home design for life-long living focused on avoid-

ance or removal of barriers. Marketed as an essential element for housing across all ages, Pynoos et al. (2009) refer to universal design as “the anchor in aging friendly communities.” In NC, North Carolina State University’s School of Design has a Center for Universal Design which promotes housing for all ages and provides technical assistance to individuals and organizations interested in incorporating universal design concepts in their community development projects ([www.ncsu.edu/project/design-projects/udi/](http://www.ncsu.edu/project/design-projects/udi/)).

##### **2.2.4.2 Senior Centers**

There are over 11,000 senior centers nationally. As Pardasani and Thompson (2010) note, a central goal of the Older Americans Act (OAA) of 1965 was “to enhance the well-being of community-dwelling older adults and delay or prevent institutionalization.” As part of this effort, the OAA remains the largest funding source for senior centers, most of which are multi-purpose centers, offering recreation, health, nutrition, and social services. Because they have been part of the landscape for several decades, there is considerable evidence on participation and benefits. Pardasani and Thompson (2010) have summarized the research.

They note that, age-wise, participation peaks in the mid-70s-early-80s, and participants have themselves been gray-ing—that is, they are not being replaced in the same numbers by younger cohorts. Participants are most likely to be white, single or widowed women with minimal disability. Most participants are middle-to-low income.

Numerous positive benefits have been documented, including increased social support, improved diet and nutrition. Pardasani and Thompson (2010) note that health and wellness are at the core of many of the senior centers’ offerings and further that numerous studies document the benefits of this programmatic thrust for senior participants.

Declining participation—notwithstanding minor structural changes in facilities<sup>19</sup>—and shifting characteristics of the aging baby boomer cohorts have prompted major changes in both the design and organization of senior centers (see Hostetler 2011). Pardasani and Thompson (2010) surveyed “innovative” senior centers and identified six emerging forms and their characteristics. The six types of innovative centers, which are rarely identi-

<sup>18</sup> A maximum budget of \$1,000 per home was allocated for safety and functional modifications—an amount that was just adequate in a pilot study of CAPABLE.

<sup>19</sup> Cohen et al. 2009 report that renovation of a senior exercise center in Texas did not increase participation.

fied as senior centers in the elder care marketplace, are: community center; wellness center; lifelong learning/arts centers; continuum of care/life transition centers; entrepreneurial centers, and café programs. These types of centers are characterized by a set of key characteristics including hours of operation, main source of funding, and whether they identify as senior centers. Pardasani and Thompson (2010) note that lack of resources to sustain operations and the absence of standards for compiling data so that evidence-based cases for financial support can be made are major hurdles that constrain the adoption and spread of these new forms of senior centers.

Design and organization may have an important role in increasing participation and program effectiveness at senior centers. For example, Eaton and Salari (2005) report that computer training in a room set aside as a computer lab was much more effective than setting up computers in multi-purpose rooms.

Strengthening social networks through participation at senior centers may be central to both individual well-being and effective health services. Participation may be increased in some settings through specific activities. Gitelson et al. (2008) report increased participation and engagement when senior centers provide congregate meals. As noted above, a range of positive outcomes have been associated with strengthened social networks established at senior centers. For example, Fulbright (2010) reports decreased depression associated with strengthened social networks. Gallagher et al. (2009) examined the “convoy model” of health service delivery, an approach that works to place each senior in their social context while also creating nurse managers within their social network. This study identified three main areas where this case-management model addressed needs: managing contacts with health insurance bureaucracy and public transportation; designing specific actions plans for individuals; and implementing effective case management.

Much of this literature on senior centers ignores the potential roles of other existing community institutions, such as churches (Krause, 2009), in facilitating successful aging. However, there is some evidence of the positive role of a range of existing social institutions. For example, Gardner (2011) examined the effects of natural neighborhood networks on aging in place. He identified three layers of such networks: “third places” like local restaurants, small groceries and barbershops where social interaction is leveled; community organizations like churches; and threshold places like porches and backyards. Aranda et al. (2011) document the positive health effects of being embedded in social and cultural networks of support in ethnic homogenous neighborhoods—in this case Mexican

Americans—on frailty status of seniors age 75 and older net of individual-level effects.

#### *2.2.4.3 Neighborhoods and Communities*

Existing communities with growing numbers of elderly are being examined as “models” of aging communities. The aging-in-place literature focuses heavily on Naturally Occurring Retirement Communities (NORCs), neighborhoods where a high proportion (often 50% or more) of residents are elderly. The elder village is another emerging model of living and service delivery. Villages are consumer-driven, volunteer-first, and self-governing organizations that support formal care in place. Greenfield et al. (2012) propose a framework for examining the NORC and village models for aging in place. They posit three key categories of activities and services for these communities: 1) civic engagement and empowerment; 2) social relationship building; and 3) enhancing access to resources. While the NORC and village models offer interest and promise in these three areas, they present no evidence or evaluation. Scharlach (2012) reviews evidence on the preference for aging in place and the policies and programs that support aging in place. No specific outcomes are evaluated.

Scharlach et al. (2012) also examine the characteristics, goals and challenges of 30 elder villages, concluding that villages are a promising model for addressing middle-class aging in place. Current models may face financial sustainability challenges, but affiliation with existing social services and broader economic support may make the village model a viable approach to aging in place for those that can afford it.

There are papers examining health needs and delivery of health service in NORCs (Lyon and Magai 2001; Black 2008; Cohen-Mansfield et al. 2010). These papers raise some broader issues for service delivery, but the studies are limited to small populations with high needs.

#### *2.2.5 Assistive Technologies*

Both person-centered and built environment-centered technological innovations have been introduced to facilitate successful aging in place and aging in the community. As Sereny and Gu (2011) note, for example, “[o]ften homes can be modified and technology can be used to make the home suitable for an older adult with declining health.”



At the person-level, a number of telecommunication companies, including AT&T, have introduced smart shoes and smart slippers as well as smart pill boxes and prescription bottles into the elder care marketplace. Equipped with sensors, these devices enable caregivers, medical professionals, and other service providers to remotely monitor a range of elder behaviors, including activities of daily living, medication management, and falls prevention, from cellphones and other smart devices.

Sensors and other digital monitoring devices are expanding beyond the person and personal belongings like shoes now to encompass entire home environments. Technological developers talk optimistically about Smart Homes where activities of older people aging in place care be remotely monitored. These technological advances allow chronic diseases like hypertension and diabetes to be managed through telemedicine.

Home monitoring may be especially important in rural areas where geography affects access and costs. While the technologies offer great promise, recent research highlights significant hurdles and challenges that must be overcome to effectively integrate these new technologies in health delivery systems.

First of all, seniors aging in place must be willing to adapt new technologies, and many resist. Milligan, et al. (2011) report that in spite of the enthusiasm of EU governments for home monitoring (mainly as a way to reduce health care costs), little attention has been devoted to how the technologies are actually implemented. Poor understanding of the systems by providers, family care-givers, and seniors targeted for monitoring reduces effective use of home monitoring. Mahoney (2011) found that the best predictor of adaptation came from simply asking the individual if they were going to use the monitor (many weren't).

Demeris et al (2009) installed and evaluated In-Home Monitoring Systems (IMS) in a retirement community. Study participants had overall positive perspectives. Adaptation followed three phases: familiarization; adjustment and curiosity; full integration. Integration of the technological systems and support systems are important for adaptation in various settings. Van Hoof et al. (2011) found sensors linked to a call center made elders feel safer. Chiu and Yang (2010) report that seniors and members of the broader community in rural Taiwan had to develop trust in home monitoring systems. Trust was built through links with specific roles in community centers, temples, and hospitals.

Second, there are systemic challenges with health care industry information management systems. Many of the early

systems focused on technological development with little concern for costs or the technological complexity for the users. McCall et al. (2012) propose a system that both reduces costs and is user-friendly. Skubic, et al. (2009) identify the challenge of linking specific health events with the continuous flow of information from each home in a monitoring system. Privacy concerns may limit adaptation. Caine et al. (2011) developed and tested a system that allows individuals to control transmission of data, thus addressing privacy concerns while benefiting from home monitoring.

Implementation of IMS and telemedicine are not occurring in a political and economic vacuum. Crossen-Sills et al. (2009) note that economic pressures and stricter legal and regulatory mandates have forced home-visiting nurses to rely more heavily on technology, including electronic document systems, telemedicine telephony for the necessary more-effective communication with home health care providers, and e-learning for the providers.

Technologies that support aging in place are leading to a re-organization of health services. Effken (2009) reviews roles of nurses using IT for health delivery and care management in underserved rural areas. She reports that "To maximize benefits, rural stakeholders (as individuals and groups) must collaborate to effect change," a finding similar to the result in rural Taiwan noted above.

Tele-medicine has been practiced for a longer period than many of the new home monitoring systems. Van Den Berg et al. (2012) review 68 studies that examine the effectiveness of telemedicine in treating older patients. In these 68 studies, telemedicine was more effective in behavioral outcomes (e.g. taking medications) than in medical outcomes (e.g. reducing blood pressure) or economic outcomes (e.g. reducing hospitalization). Sparrow et al. (2011) report on a computer-based telecommunications exercise intervention that led to improvements in participants' strength, balance and depressive symptoms. Other studies suggest that advances in appropriate telecommunication devices may reduce the social isolation of seniors living alone (Rebola and Jones, 2011).

### **2.2.6 Falls Prevention**

Falls prevention among seniors has long been a priority and is central to many aging in place policies and programs, as noted for both North Carolina and South Carolina. Nu-



merous clinical studies—most often in nursing home settings—showed effectiveness in reducing falls. Some community-based programs have been effective. For example, Washington State's efforts have been credited with significantly reducing falls. It's in-home (Stepping On program) and in-facility (Sure Step program) involve strengthening, aerobics, balance training and home safety. In addition, the program helps seniors develop individual "fall-free plans" (Michele, 2010).

However, several well-designed recent studies have found that comprehensive falls prevention programs in community settings have more challenges than many anticipated. Faes et al. (2010) analyzed a multifactorial fall prevention program for pairs of community-dwelling frail older fallers and their informal caregivers and found no effect on fall prevention. Elley et al. (2008) evaluated a nurse-led intervention in community setting, and found that the program was not effective in reducing falls. Wijnhuizen et al., (2007) evaluated a multifactorial program to reduce falls among community-dwelling seniors. After ten months, there was no effect in reducing falls. Not all results have been negative. Price et al. (2008) report on an evaluation design that compared falls among a control group with no intervention, an intervention from information at primary care and a secondary intervention comprised of specific fall prevention training and home assessment. There was no difference in falls between those receiving the primary care intervention and the control group, but there was a significant reduction in those receiving the secondary intervention and both the control group and those receiving the primary care intervention. Other studies have shown that improving physical function and balance reduce the fear of falling, but do not evaluate where falls are reduced (Banez et al. 2008).

Many intervention designs have assumed that we understand risk factors: dangers from home design; dangers from objects in the homes; dangers from medication. We may know less than we think. Greene et al. (2009) conducted a survey to identify and reduced risk from known hazards. They report that most of the recommendations to reduce hazards were unrelated to subsequent falls. Russell et al. (2008) evaluated the reliability and predictive accuracy of an assessment tool of the fall risks for older people living in the community. While the assessment tool was statistically reliable, it was only moderately able to predict falls. Zecevic et al. (2009) propose a systemic risk evaluation method that moves beyond the person-centered approach most widely used. They evaluate risks associated with place and with behaviors using a method adapted from assessments of transportation accidents. This systemic approach may

yield greater predictive accuracy of hazards resulting in falls.

Adequate funding and staffing are challenges to the effectiveness and sustainability of community-based falls prevention programs. Kramer et al. (2011) surveyed staffs at six community centers that had falls preventions programs, and all reported that their staffs either were too small or inadequately trained and funding for fall prevention had not become part of the core funding of their centers and thus was vulnerable to funding cuts.

Like many of the efforts we review to support aging in place, fall prevention may be most successful when it is well integrated into the community. Peterson and his colleagues interviewed older individuals after their homes had been modified to reduce risk of falling. They found three prerequisites to feeling safe at home: 1) feeling healthy, 2) having someone in the community they can rely on, and 3) feeling at home. The individual conditions (feeling healthy and at home) had to be set in the community (someone to rely on) for home modification to improve their perspectives.

### 3.0 DISCUSSION

#### 3.1 Critical Reflections

Aging in place research and program evaluation is in its infancy. As we have shown above, some potentially promising person-centered initiatives do exist. But most of the research on these activities is exploratory and descriptive, relying on small, convenience samples of seniors who are recruited to participate in focus group, face-to-face, or telephone interviews about their perceptions of and experiences with various types of aging in place interventions. Large scale studies with the requisite statistical power to make definitive generalizations regarding veracity, scalability, and return on investments in these initiatives simply do not exist.

The limited evidence that does exist raises questions about the potential long-term viability and sustainability of these initiatives. Aside from relying almost solely on the kindness of strangers (i.e., foundation and private sector support) to sustain operations, some of the interventions also rely almost solely on volunteers in their efforts to serve the needs of seniors. And the research shows that many of these volunteers are themselves aging and therefore, as a consequence of having to deal with their own mortality, probably cannot be relied upon for the kind of sustained engagement that interventions with the aged—especially the oldest old—requires.<sup>20</sup>

Similar weaknesses exist in the built environment-centered research and interventions. Finding appropriate measures and establishing a clear link between built environment alterations and health outcomes among seniors has been difficult. Moreover, the literature is long on frameworks (e.g. Landorf et al. 2008; Bookeman 2008; Burton et al. 2011; Lehning et al. 2012) and short on evidence. And, most of this research focuses on the urban built environment, addressing design issues that generally apply to all elderly (e.g., designing appropriate transportation systems). There is sparse evidence of any health effects resulting from built-environment modifications for seniors living in cities (see Lehning 2012 and Keyes et al. 2011). There is essentially no research on effects of changes in built environment on the health and well-being of seniors in small towns and rural areas.

A number of state level programs exist to support aging

---

<sup>20</sup> *The CAPS ambassadors program reviewed above is a case in point (Blair, 2012). The 20 volunteers' ages ranged from early 40s to early 70. Six of them were 65 or older at the time the study was conducted, which probably explains the previously noted finding that "Number of hours of service per week were highly variable, with some ambassadors reporting only a few hours and others reporting 40 h or more in a typical week" (p. 1771).*

populations in North Carolina and South Carolina. Websites exist to connect seniors with South Carolina's Healthy Aging Policy Platform Initiative ([www.scdhec.gov/health/chcdp/healthyaging/docs/HAPPI%20Document%20Final%20Version%20030611%20pdf.pdf](http://www.scdhec.gov/health/chcdp/healthyaging/docs/HAPPI%20Document%20Final%20Version%20030611%20pdf.pdf)), which provides an overview of programs and organizations that address emerging chronic health needs of the state's aging population, and to the resources of the North Carolina Division of Aging and Adult Services (<http://aging.sc.gov/>), which promotes senior independence through community-based services. Information about available services and resources supposedly is made available to seniors and elder service organizations in every county in both states. But, as noted earlier, Dye, Willoughby, and Battisto's (2011) focus groups interviews with a small group of elders in a rural county in South Carolina suggest the information is not being effectively disseminated to seniors most in need of assistance and services. Moreover, South Carolina officials acknowledge that, while their focus is on evidence-based prevention programs, "[u]nfortunately, only a small percentage of these interventions have been translated into evidenced based prevention programs (EBPPS) that are packaged for implementation in [South Carolina] community settings."

It also should be noted that neither North Carolina nor South Carolina is among the six pilot states (Georgia, Iowa, Kansas, Michigan, New York, Oregon, and Pennsylvania) plus the District of Columbia in AARP's recently launched Network of Age Friendly Communities. Affiliated with the World Health Organization's (WHO) Global Network of Age-Friendly Cities and Communities, this initiative is designed to provide a system to educate, encourage, promote, and recognize improvements that make cities, towns, and counties more user friendly not only for their old residents but for residents of all ages.<sup>21</sup>

Several papers reviewed above focus on the role of technology in serving the rural elderly as they seek to age in place. However, beyond these few papers, there is little focus on the rural elderly, the role of key social institutions like churches, the shifting demography that takes family members that in the past provided care away in search of jobs, the demands of formal social support on areas with declining tax bases, and other issues. The rural elderly must be brought into the policy discussion.

As a final reflection on current status of aging in place research and programming, it is worthwhile to repeat here an ob-

---

<sup>21</sup> *For a detailed description of this program, see Nancy Thompson, 2012, "AARP Launches New Network to Foster Age-Friendly Communities," April 4, available at <http://www.aarp.org/about-aarp/press-center/info-04-2012/AARP-Launches-Network-to-Foster-Age-Friendly-Communities.html>*

servation made by Dye, et al (2011, p. 80):

Federal programs, such as Medicare and Medicaid, acknowledge the cost savings of helping older adults stay in their homes for as long as possible rather than be moved to institutional care. In spite of this acknowledgement, however, Medicare reimburses only limited home health services for those with acute medical problems after a hospital stay. And skilled care is reimbursed only for as long as the acute medical condition persists. Medicare does not provide continuous long-term services needed to meet chronic health and safety needs of older adults. Additionally, decreased federal funding for senior housing has not been accompanied by adequately increased funding for supportive, assistive services for residents staying in their home communities, especially those in rural communities. Various health and social services may exist in rural communities, but accessing these services is difficult due to the disconnected sources of program information, inadequate financial resources, and the limited ability of consumers to read program materials.

### 3.2 Moving Forward

To fill existing gaps in both research and program implementation, what is needed in this space is a centralized hub for successful aging in place ideas, innovations, and practices. Such an entity, as we envision it, would serve five specific but interrelated functions: mobilize collective ambition, leverage intellectual capital, facilitate new venture creation training, foster social innovation, serve as a clearinghouse for information dissemination, and engage in succession planning.

#### 3.2.1 Mobilize Collective Ambition

As noted previously, a broad array of initiatives, programs, and activities exist to help seniors in the TDE footprint to age in place. But they are disjointed, disconnected, and in most instances poorly funded and thus not sustainable, resulting in significant

gaps in the aging in place safety net, particularly in rural communities. Given this state of affairs, a concerted effort is needed to leverage the power of collective ambition to devise innovative models and sustainable strategies to foster and facilitate successful aging in place. A strategy widely used in the world of business today to weather the current economic crisis,<sup>22</sup> leveraging the power of collective ambition, in this specific instance, means helping key community stakeholders--government officials, service providers, church leaders, and others--and their staff to think about why they exist, what they expect to accomplish, how they will collaborate to achieve their ambition, and their commitments to seniors and their caregivers.

Sustained engagement and disciplined execution are the foundations of collective ambition. The former is the glue and the latter is the grease that makes the process work. In the words of Jim Collins, author of *From Good to Great*, sustained engagement is about making sure everyone is on the bus, in the right seat, headed in the right direction at all times. Disciplined execution is about core values and brand promise. In this instance, it is about devising strategies and implementing interventions that guarantee the elderly affection, protection, correction, and connections needed to successfully age in place (see Table 24).

#### 3.2.2 Leverage Intellectual Capital

Enormous intellectual capital exists in area universities and nonprofit organizations which can be leveraged to design, implement, and/or evaluate interventions aimed at improving the quality of life for seniors in the TDE footprint. The UNC Scholars Advisory Panel, which was created by former UNC System President Erskine Bowles to devise strategies for how the constituent universities in the UNC system can help the state address competitiveness issues over the next twenty years, is an excellent model for such an initiative.<sup>23</sup>

#### 3.2.3 New Venture Creation Laboratory

Research suggest that a major opportunity exist to leverage the nascent entrepreneurial skills, talents, and acumen that exist among health professionals and other elder care service provid-

<sup>22</sup> See Douglas A. Ready and Emily Truelove, 2011, "The Power of Collective Ambition," *Harvard Business Review*, December, pp. 95-102.

<sup>23</sup> Information on the UNC Tomorrow Commission is available at <http://www.northcarolina.edu/nctomorrow/index.htm>

ers (Farmer and Kilpatrick, 2009) as well as university students, especially Generation Y, which has been labeled the innovation generation. For individuals interested in elder care, this lab would be a place where they can receive basic training in social entrepreneurship, explore the feasibility of their idea or innovation, learn how to write a business plan for their proposed venture that adheres to the principles of social sustainability, and prepare an elevator pitch for investments in their idea.

This is an ideal venue for key community stakeholders—rural churches, non-profit health care organizations, insurance companies, home improvement companies, and smart technology companies, university researchers, and other entities<sup>24</sup> to develop innovative person-centered (e.g., multifactorial vision care and falls prevention programs) and built environment-centered (e.g. senior playgrounds and fitness centers) social purpose ventures that will foster and facilitate successful aging in place.

### 3.2.4 Social Innovation Fund

Social venture capital is needed to support the launch of new social purpose ventures and to scale, replicate, and franchise evidence-based best practices in the successful aging in place space. Such a fund can be modeled after the \$1 Billion Health Innovations Challenge launched by the U.S. Department of Health and Human Services<sup>25</sup> or the North Carolina Blue-Cross Blue Shield Health Innovation Challenge.<sup>26</sup> A business plan competition model, widely used in business schools, can be employed to vet business plans. Targets for investments for the

24 For example, the timing is right to engage companies that market complementary and alternative medicines in social purpose ventures aimed at promoting successful aging in place. Wilkinson and Jelinek (2009) investigated the use of complementary and alternative medicines (CAM) among 102 older seniors (average age 66) who attended a multidisciplinary health screening clinic in Australia. As the authors point out, “[c]omplementary and alterative medicines (CAM) are a diverse range of medicines and therapies that typically lie outside of the dominant health care system” (p. 80). They go on to note that “Included under the umbrella term of CAM are whole medical systems (e.g., traditional Chinese medicine, naturopathic medicine), biological and energy based medicines/therapies, mind-body therapies and tactile or manipulative therapies (e.g., remedial massage)” (p. 80). Among the 102 study participants, “three quarters (785) . . . had used at least one CAM product within the past 12 months and 66% had visited a CAM practitioner” (p. 80). Vitamin/mineral supplements (e.g., omega-3 fish oils) and herbal supplements (e.g., glucosamine) were the most frequently used products. Such products are used by seniors as self-management strategies in their efforts to cope with ailments that accompany aging such as arthritis, chronic respiratory conditions, and back pain, as well as hypertensive disease and diabetes mellitus.

25 Information about this initiative is available at <http://www.hhs.gov/news/press/2011pres/11/20111114a.html>.

26 A brief description of this initiative is available at <http://www.technicianonline.com/features/blue-cross-blue-shield-hosts-health-innovation-challenge-1.2730507>.

social innovations fund would be twofold: new ideas emanating from the new venture creation lab and existing, evidence-based best practices worldwide which are worthy of scaling, replication, or franchising.

Table 24  
CORE VALUES OF A COMPREHENSIVE AGING IN PLACE INTERVENTION

Values	Attributes
Protection	Safe, healthy, harm-free environments Culturally competent caregivers and service providers
Affection	Nurturance, kindness & compassion Loving and caring
Connection	Sense of belonging Linked to network of people & institutions
Correction	High expectations to do what is right; encouragement, resilience, self-discipline

### 3.2.5 Aging in Place Clearinghouse

Leverage the intellectual assets of the scholars advisory panel, the creative ideas emanating from the new ventures lab, and information about social purpose ventures receiving financing from the social innovations fund to prepare white papers and policy briefs as well as convene workshops and conferences to educate policymakers and other key stakeholders about evidenced-based best practices as well as advocate for policy prescriptions needed to continue to promote successful aging in place.

### 3.2.6 Succession Planning

Like society in general, the human capital base that propels the successful aging in place movement is aging. Many of the proponents and advocates will be retiring within the next decade or so. It is therefore necessary to begin to develop the next generation of talent that will continue the work that is needed in this field. This is especially important in our rural areas. There are two aspects to succession planning: identifying the next generation of talent; and insuring successful knowledge transfer from the current generation to the next generation of leaders and practitioners. Thus, a pipeline of interdisciplinary education training programs at the undergraduate, doctoral, and postdoctoral levels is needed. These efforts should be augmented by scholar-in-residence and practitioner-in-residence programs to ensure successful knowledge transfer to this new pipeline of talent.





#### 4.0 LITERATURE CONSULTED IN THIS STUDY

Alanen, S. I., Johannala-Kemppainen, R., Ijäs, J. J., Kaila, M., Klockars, M., Mäkelä, M., & Välimäki, M. A. (2007). Evaluation of Current Care Effectiveness: A Survey of Hypertension Guideline Implementation in Finnish Health Centres. *Scandinavian Journal of Primary Health Care*, 25(4), 232-236. doi:10.1080/02813430701394050

Alley, D., Liebig, P., Pynoos, J., Banerjee, T., & In, H. C. (2007). Creating Elder-Friendly Communities: Preparations for An Aging Society. *Journal of Gerontological Social Work*, 49(1), 1-18.

An, Y. (2011). Study on the Construction of the Day Care Centre for the Elderly in Chinese Communities. *Cross-Cultural Communication*, 7(4), 66-70. doi:10.3968/j.ccc.1923670020110704.355

Andersson, J. E. (2011). Architecture for the Silver Generation: Exploring the Meaning of Appropriate space for Ageing in a Swedish Municipality. *Health & Place*, 17(2), 572-587. doi:10.1016/j.healthplace.2010.12.015

Andrews, G. J., Hall, E., Evans, B., & Colls, R. Moving Beyond Walkability: On the Potential of Health Geography. *Social Science & Medicine*, (0) doi:10.1016/j.socscimed.2012.08.013

Anetzberger, G. J. (2010). Community Options of Greater Cleveland, Ohio: Preliminary Evaluation of a Naturally Occurring Retirement Community Program. *Clinical Gerontologist*, 33(1), 1-15. doi:10.1080/07317110802478032

Aranda, M. P., Ray, L. A., Snih, S. A., Ottenbacher, K. J., & Markides, K. S. (2011). The Protective Effect of Neighborhood Composition on Increasing Frailty Among Older Mexican Americans: A Barrio Advantage? *Journal of Aging & Health*, 23(7), 1189-1217. doi:10.1177/0898264311421961

Ball, M. M., Perkins, M. M., Whittington, F. J., Connell, B. R., Hollingsworth, C., King, S.V., . . . Combs, B. L. (2004). Managing Decline in Assisted Living: The Key to Aging in Place. *Journals of Gerontology Series B: Psychological Sciences & Social Sciences*, 59B(4), 202-S212

Banez, C., Tully, S., Amaral, L., Kwan, D., Kung, A., Mak, K., . . . Alibhai, S. M. H. (2008). Development, Implementation, and Evaluation of an Interprofessional Falls Prevention Program for Older Adults. *Journal of the American Geriatrics Society*, 56(8),

1549-1555. doi:10.1111/j.1532-5415.2008.01790.x

Behr, R., Sciegaj, M., Walters, R., Bertoty, J., & Dungan, R. (2011). Addressing the Housing Challenges of an Aging Population: Initiatives by Blueroof Technologies in McKeesport, Pennsylvania. *Journal of Architectural Engineering*, 17(4), 162-169. doi:10.1061/(ASCE)AE.1943-5568.0000033

Berke, E. M., Gottlieb, L. M., Moudon, A. V., & Larson, E. B. (2007). Protective Association Between Neighborhood Walkability and Depression in Older Men. *Journal of the American Geriatrics Society*, 55(4), 526-533. doi:10.1111/j.1532-5415.2007.01108.x

Bevan, M. (2009). Planning for an Ageing Population in Rural England: The Place of Housing Design. *Planning Practice & Research*, 24(2), 233-249. doi:10.1080/02697450902827386

Bhushan, S. (2010). Aging in Place. Long-Term Living: For the Continuing Care Professional, 59(1), 20-23.

Bigby, C. (2008). Beset by Obstacles: A Review of Australian Policy Development to Support Ageing in Place for People with Intellectual Disability. *Journal of Intellectual & Developmental Disability*, 33(1), 76-86. doi:10.1080/13668250701852433

Black, K. (2008). Health and Aging-in-Place: Implications for Community Practice. *Journal of Community Practice*, 16(1), 79-95. doi:10.1080/10705420801978013

Blackstock, K. L., Innes, A., Cox, S., Smith, A., & Mason, A. (2006). Living With Dementia in Rural and Remote Scotland: Diverse Experiences of People With Dementia and Their Carers. *Journal of Rural Studies*, 22(2), 161-176. doi:10.1016/j.jrurstud.2005.08.007

Blair, T. R. W. (2012). "Community Ambassadors" for South Asian Elder Immigrants: Late-Life Acculturation and the Roles of Community Health Workers. *Social Science & Medicine*, 75(10), 1769-1777. doi:10.1016/j.socscimed.2012.07.018

Boen, H., Dalgard, O. S., Johansen, R., & Nord, E. (2010). Socio-Demographic, Psychosocial and Health Characteristics of Norwegian Senior Centre Users: A Cross-sectional Study. *Scandinavian Journal of Public Health*, 38(5), 508-517.

Bolender, B. C. (2010). Boom or Bust: Opportunities and Challenges of Aging in Rural Kansas. *Online Journal of Rural Research & Policy*, 5(1), 1-29.

- Bookman, A. (2008). Innovative Models of Aging in Place: Transforming Our Communities for an Aging Population. *Community, Work & Family*, 11(4), 419-438. doi:10.1080/13668800802362334
- Bouck, C. (2008). Design for the Ages. *Parks & Recreation*, 43(6), 62-66.
- Boulton-Lewis, G., Buys, L., Lovie-Kitchin, J., Barnett, K., & David, L. N. (2007). Ageing, Learning, and Computer Technology in Australia. *Educational Gerontology*, 33(3), 253-270. doi:10.1080/03601270601161249
- Brandon, C. A., Gill, D. P., Speechley, M., Gilliland, J., & Jones, G. R. (2009). Physical Activity Levels of Older Community-Dwelling Adults are Influenced by Summer Weather Variables. *Applied Physiology, Nutrition & Metabolism*, 34(2), 182-190. doi:10.1139/H09-004
- Brewer, D. P., Catlett, C. S., Porter, K. N., Jung Sun, L. E. E., Hausman, D. B., Reddy, S., & Johnson, M. A. (2010). Physical Limitations Contribute to Food Insecurity and the Food Insecurity-Obesity Paradox in Older Adults at Senior Centers in Georgia. *Journal of Nutrition for the Elderly*, 29(2), 150-169. doi:10.1080/01639361003772343
- Brittain, K., Corner, L., Robinson, L., & Bond, J. (2010). Ageing in Place and Technologies of Place: The Lived Experience of People with Dementia in Changing Social, Physical and Technological Environments. *Sociology of Health & Illness*, 32(2), 272-287. doi:10.1111/j.1467-9566.2009.01203.x
- Brooks, J. O., Smolentzov, L., DeArment, A., Logan, W., Green, K., Walker, I., . . . Mayweather, L. (2011). Toward a "Smart" Nightstand Prototype: An Examination of Nightstand Table Contents and Preferences. *Health Environments Research & Design Journal (HERD)*, 4(2), 91-108
- Burholt, V., & Dobbs, C. Research on Rural Ageing: Where Have We Got To and Where are We Going in Europe? *Journal of Rural Studies*, (0) doi:10.1016/j.jrurstud.2012.01.009
- Burnett, P., & Lucas, S. (2010). Talking, Walking, Riding and Driving: The Mobilities of Older Adults. *Journal of Transport Geography*, 18(5), 596-602. doi:10.1016/j.jtrangeo.2010.05.006
- Byrnes, M. E. (2011). A City Within a City: A "Snapshot" of Aging in a HUD 202 in Detroit, Michigan. *Journal of Aging Studies*, 25(3), 253-262. doi:10.1016/j.jaging.2011.03.011
- Cabin, W. D., & Fahs, M. C. (2011). Eyes Wide Open or Not: Developing a Model for Predicting Depression Among Older Americans. *Home Health Care Management & Practice*, 23(5), 342-355. doi:10.1177/1084822310384924
- Caine, K., Zimmerman, C., Schall-Zimmerman, Z., Hazlewood, W., Jean Camp, L., Connelly, K., . . . Shankar, K. (2011). DigiSwitch: A Device to Allow Older Adults to Monitor and Direct the Collection and Transmission of Health Information Collected at Home. *Journal of Medical Systems*, 35(5), 1181-1195. doi:10.1007/s10916-011-9722-1
- Cannuscio, C., Block, J., & Kawachi, I. (2003). Social Capital and Successful Aging: The Role of Senior Housing. *Annals of Internal Medicine*, 139(5), 395.
- Chapman, N. J., & Howe, D. A. (2001). Accessory Apartments: Are They a Realistic Alternative for Ageing in Place? *Housing Studies*, 16(5), 637-650. doi:10.1080/02673030120080099
- Chu, L., Chiu, A. Y. Y., & Chi, I. (2008). Falls and Subsequent Health Service Utilization in Community-Dwelling Chinese Older Adults. *Archives of Gerontology & Geriatrics*, 46(2), 125-135. doi:10.1016/j.archger.2007.03.005
- Chu, Y. K. G., Kaldenberg, J., & Huefner, K. (2009). The Elder's Right to Sight Collaborative: A New Model of Eye Care Delivery for the Elderly. *Optometry - Journal of the American Optometric Association*, 80(11), 651-656. doi:10.1016/j.optm.2009.03.019
- Chui, E. (2008). Introduction to Special Issue on 'Ageing in Place'. *Ageing International*, 32(3), 165-166. doi:10.1007/s12126-008-9016-1
- Clark, K. (2011). Keep Them Safe @ Home. *Money*, 40(5), 90-94.
- Clune, A., Fischer, J. G., Lee, J. S., Reddy, S., Johnson, M. A., & Hausman, D. B. (2010). Prevalence and Predictors of Recommendations to Lose Weight in Overweight and Obese Older Adults in Georgia Senior Centers. *Preventive Medicine*, 51(1), 27-30. doi:10.1016/j.ypmed.2010.04.003
- Cohen, D. A., Sehgal, A., Williamson, S., Marsh, T., Golinelli, D., & McKenzie, T. L. (2009). New Recreational Facilities for the Young and the Old in Los Angeles: Policy and Programming Implications. *Journal of Public Health Policy*, 30, 248-S263. doi:10.1057/jphp.2008.45

Cohen-mansfield, J., & Frank, J. (2008). Relationship Between Perceived Needs and Assessed Needs for Services in Community-Dwelling Older Persons. *Gerontologist*, 48(4), 505-516.

Cristina Pedrazzi, E., Tavares, D. M., Ramos, P.V., Cristina, C. F., Rosset Cruz, I., & Aparecida, P. R. (2010). Household Arrangements of the Elder Elderly. *Revista Latino-Americana De Enfermagem (RLAE)*, 18(1), 18-25.

Crossen-Sills, J., Toomey, I., & Doherty, M. E. (2009). Technology and Home Care: Implementing Systems to Enhance Aging in Place. *Nursing Clinics of North America*, 44(2), 239-246. doi:10.1016/j.cnur.2009.03.003

Curch, L. M. (2010). Rural ageing: A Good Place to Grow Old? - edited by Norah Keating. *Rural Sociology*, 75(3), 516-520. doi:10.1111/j.1549-0831.2010.00022\_2.x

Cutchin, M. P. (2003). The Process of Mediated Aging-in-Place: A Theoretically and Empirically Based Model. *Social Science & Medicine*, 57(6), 1077. doi:10.1016/S0277-9536(02)00486-0

Deehr, R. C., & Shumann, A. (2009). Active Seattle: Achieving Walkability in Diverse Neighborhoods. *American Journal of Preventive Medicine*, 37, 403-411. doi:10.1016/j.amepre.2009.09.026

Demiris, G., Oliver, D. P., Dickey, G., Skubic, M., & Rantz, M. (2008). Findings from a Participatory Evaluation of a Smart Home Application for Older Adults. *Technology & Health Care*, 16(2), 111-118.

Designers Speak for Themselves. (2011). *Long-Term Living: For the Continuing Care Professional*, 60(6), 50-52.

Dickison, E. (2012). Aging in Place. *USA Today Magazine*, 141(2806), 74-75.

Dishman, E. (2004). Inventing Wellness Systems for Aging in Place. *Computer*, 37(5), 34-41.

Drazin, A., & Roberts, S. (2009). Exploring Design Dialogues for Ageing in Place. *Anthropology in Action*, 16(1), 72-88. doi:10.3167/aia.2009.160107

Dye, C. J., Willoughby, D. F., & Battisto, D. G. (2011). Advice from Rural Elders: What it Takes to Age in Place. *Educational Gerontology*, 37(1), 74-93. doi:10.1080/03601277.2010.515889

Eaton, J., & Salari, S. (2005). Environments for Lifelong Learning in Senior Centers. *Educational Gerontology*, 31(6), 461-480. doi:10.1080/03601270590928189

Effken, J. A., & Abbott, P. (2009). Health IT-Enabled Care for Underserved Rural Populations: The Role of Nursing. *Journal of the American Medical Informatics Association*, 16(4), 439-445. doi:10.1197/jamia.M2971

Elley, C. R., Robertson, M. C., Garrett, S., Kerse, N. M., McKinlay, E., Lawton, B., Campbell, A. J. (2008). Effectiveness of a Falls-and-Fracture Nurse Coordinator to Reduce Falls: A Randomized, Controlled Trial of at-Risk Older Adults. *Journal of the American Geriatrics Society*, 56(8), 1383-1389. doi:10.1111/j.1532-5415.2008.01802.x

Engel, J. H., Siewerdt, F., Jackson, R., Akobundu, U., Wait, C., & Sahyoun, N. (2011). Hardiness, Depression, and Emotional Well-Being and Their Association with Appetite in Older Adults. *Journal of the American Geriatrics Society*, 59(3), 482-487. doi:10.1111/j.1532-5415.2010.03274.x

Everingham, J., Petriwskyj, A., Warburton, J., Cuthill, M., & Bartlett, H. (2009). Information Provision for an Age-Friendly Community. *Ageing International*, 34(1), 79-98. doi:10.1007/s12126-009-9036-5

Faes, M. C., Reelick, M. F., Melis, R. J., Borm, G. F., Es-selink, R. A., & Olde Rikkert, M. G. (2011). Multifactorial Fall Prevention for Pairs of Frail Community-Dwelling Older Fallers and Their Informal Caregivers: A Dead End for Complex Interventions in the Frailest Fallers. *Journal of the American Medical Directors Association*, 12(6), 451-458. doi:10.1016/j.jamda.2010.11.006

Fänge, A., & Ivanoff, S. D. (2009). The Home is the Hub of Health in Very Old Age: Findings from the ENABLE-AGE Project. *Archives of Gerontology and Geriatrics*, 48(3), 340-345. doi:10.1016/j.archger.2008.02.015

Farmer, J., & Kilpatrick, S. (2009). Are Rural Health Professionals also Social Entrepreneurs? *Social Science & Medicine*, 69(11), 1651-1658. doi:10.1016/j.socscimed.2009.09.003

Farmer, J., Philip, L., King, G., Farrington, J., & MacLeod, M. (2010). Territorial Tensions: Misaligned Management and Community Perspectives on Health Services for Older People in Remote Rural Areas. *Health & Place*, 16(2), 275-283. doi:10.1016/j.healthplace.2009.10.010

- Fernandes, G. (2008). Implementation of Best Practice in Advance Care Planning in an 'Ageing in Place' Aged Care Facility. *International Journal of Evidence-Based Healthcare*, 6(2), 270-276. doi:10.1111/j.1744-1609.2008.00093.x
- Fernandez, S., Scales, K. L., Pineiro, J. M., Schoenthaler, A. M., & Ogedegbe, G. (2008). A Senior Center-Based Pilot Trial of the Effect of Lifestyle Intervention on Blood Pressure in Minority Elderly People with Hypertension. *Journal of the American Geriatrics Society*, 56(10), 1860-1866. doi:10.1111/j.1532-5415.2008.01863.x
- Fine, M. (2012). Employment and Informal Care: Sustaining Paid Work and Caregiving in Community and Home-Based Care. *Ageing International*, 37(1), 57-68. doi:10.1007/s12126-011-9137-9
- Fitzpatrick, T. R. (2010). Brain Fitness Activities and Health Among Older Female Senior Center Participants in Montreal, Quebec. *Activities, Adaptation & Aging*, 34(1), 30-47. doi:10.1080/01924780903552287
- Fitzpatrick, T. R., & McCabe, J. (2008). Future Challenges for Senior Center Programming to Serve Younger and More Active Baby Boomers. *Activities, Adaptation & Aging*, 32(3), 198-213. doi:10.1080/01924780802563187
- Force, L., Kahana, J. S., & Capalbo, V. (2010). The Role of AAAs in Promoting Health for Seniors: A Preliminary Research Report. *Open Longevity Science*, , 30-35
- Frosch, D. L., Rincon, D., Ochoa, S., & Mangione, C. M. (2010). Activating seniors to Improve Chronic Disease Care: Results From a Pilot Intervention Study. *Journal of the American Geriatrics Society*, 58(8), 1496-1503. doi:10.1111/j.1532-5415.2010.02980.x
- Fulbright, S. A. (2010). Rates of Depression and Participation in Senior Centre Activities in Community-Dwelling Older Persons. *Journal of Psychiatric & Mental Health Nursing*, 17(5), 385-391. doi:10.1111/j.1365-2850.2009.01535.x
- Gallagher, L. P., Truglio-Londrigan, M., & Levin, R. (2009). Partnership for Healthy Living: An Action Research Project. *Nurse Researcher*, 16(2), 7-29.
- Gardner, P. J. (2011). Natural Neighborhood Networks — Important Social Networks in the Lives of Older Adults Aging in Place. *Journal of Aging Studies*, 25(3), 263-271. doi:10.1016/j.jaging.2011.03.007
- Gayes, P. (2007). Young at Heart. *U.S. Catholic*, 72(10), 30-33
- Gilson, S. E., & Netting, F. E. (1997). When People With Pre-Existing Disabilities Age In Place: Implications for Social Work Practice. *Health & Social Work*, 22(4), 290-298.
- Gitelson, R., Ching-hua Ho, Fitzpatrick, T., Case, A., & McCabe, J. (2008). The Impact of Senior Centers on Participants in Congregate Meal Programs. *Journal of Park & Recreation Administration*, 26(3), 136-151.
- Glasgow, N., & Brown, D. L. Rural Ageing in the United States: Trends and Contexts. *Journal of Rural Studies*, (0) doi:10.1016/j.jrurstud.2012.01.002
- Golant, S. M. (2008). Low-Income Elderly Homeowners in Very Old Dwellings: The Need for Public Policy Debate. *Journal of Aging & Social Policy*, 20(1), 1-28.
- Good Places for Ageing in Place: Development of Objective Built Environment Measures for Investigating Links with Older People's Wellbeing. (2011). *BMC Public Health*, 11(1), 839-851. doi:10.1186/1471-2458-11-839
- Grant, B. C. (2006). Retirement Villages: More Than Enclaves for the Aged. *Activities, Adaptation & Aging*, 31(2), 37-55. doi:10.1300/J016v31n02-03
- Grant, B. C. (2008). Should Physical Activity be on the Healthy Ageing Agenda? *Social Policy Journal of New Zealand*, (33), 163-177.
- Greene, D., Sample, P., & Fruhauf, C. (2009). Fall-prevention Pilot: Hazard Survey and Responses to Recommendations. *Occupational Therapy in Health Care*, 23(1), 24-39. doi:10.1080/07380570802455532
- Greenfield, E. A. (2012). Using Ecological Frameworks to Advance a Field of Research, Practice, and Policy on Aging-in-Place Initiatives. *Gerontologist*, 52(1), 1-12
- Greenfield, E. A., Scharlach, A., Lehning, A. J., & Davitt, J. K. (2012). A Conceptual Framework for Examining the Promise of the NORC Program and Village Models to Promote Aging in Place. *Journal of Aging Studies*, 26(3), 273-284. doi:10.1016/j.jaging.2012.01.003
- Guo, K., & Castillo, R. (2012). The U.S. Long Term Care System: Development and Expansion of Naturally Occurring

Retirement Communities as an Innovative Model for Aging in Place. *Ageing International*, 37(2), 210-227. doi:10.1007/s12126-010-9105-9

Haak, M., Fänge, A., Iwarsson, S., & Ivanoff, S. D. (2007). Home as a Signification of Independence and Autonomy: Experiences Among Very Old Swedish People. *Scandinavian Journal of Occupational Therapy*, 14(1), 16-24. doi:10.1080/11038120601024929

Hambleton, P., Keeling, S., & McKenzie, M. (2008). Quality of life is...: The Views of Older Recipients of Low-Level Home Support. *Social Policy Journal of New Zealand*, (33), 146-162.

Hammarström, G., & Torres, S. (2012). Variations in Subjective Well-Being When 'Aging in Place' — A Matter of Acceptance, Predictability and Control. *Journal of Aging Studies*, 26(2), 192-203. doi:10.1016/j.jaging.2011.12.004

Henderson, E. J., & Caplan, G. A. (2008). Home Sweet Home? Community Care for Older People in Australia. *Journal of the American Medical Directors Association*, 9(2), 88-94. doi:10.1016/j.jamda.2007.11.010

Henning, C., Åhnby, U., & Österström, S. (2009). Senior Housing in Sweden: A New Concept for Aging in Place. *Social Work in Public Health*, 24(3), 235-254. doi:10.1080/19371910802595307

Hickerson, B., Moore, A., Oakleaf, L., Edwards, M., James, P. A., Swanson, J., & Karla A. Henderson. (2008). The Role of a Senior Center in Promoting Physical Activity for Older Adults. *Journal of Park & Recreation Administration*, 26(1), 22-39.

Hillcoat-Nalletamby, S., Ogg, J., Renaut, S., & Bonvalet, C. (2010). Ageing Populations and Housing Needs: Comparing Strategic Policy Discourses in France and England. *Social Policy & Administration*, 44(7), 808-826. doi:10.1111/j.1467-9515.2010.00745.x

Hostetler, A. J. (2011). Senior Centers in the Era of the "Third Age:" Country Clubs, Community Centers, or Something Else? *Journal of Aging Studies*, 25(2), 166-176. doi:10.1016/j.jaging.2010.08.021

Hwang, E. (2008). Exploring Aging-in-Place Among Chinese and Korean Seniors in British Columbia, Canada. *Ageing International*, 32(3), 205-218. doi:10.1007/s12126-008-9014-3

Ingvaldsen, A. K., & Balandin, S. (2011). 'If We are Go-

ing to Include Them We Have to Do it Before We Die': Norwegian Seniors' Views of Including Seniors With Intellectual Disability in Senior Centres. *Journal of Applied Research in Intellectual Disabilities*, 24(6), 583-593. doi:10.1111/j.1468-3148.2011.00636.x

Innes, A., Morgan, D., & Kostineuk, J. (2011). Dementia Care in Rural and Remote Settings: A Systematic Review of Informal/Family Caregiving. *Maturitas*, 68(1), 34-46. doi:10.1016/j.maturitas.2010.10.002

Ivry, J. (1995). Aging in Place: The Role of Geriatric Social Work. *Families in Society*, 76(2), 76-85.

Johansson, K., Josephsson, S., & Lilja, M. (2009). Creating Possibilities for Action in the Presence of Environmental Barriers in the Process of 'Ageing in Place'. *Ageing & Society*, 29(1), 49-70

Jorgensen, D., Arksey, H., Parsons, M., Senior, H., & Thomas, D. (2009). Why Do Older People in New Zealand Enter Residential Care Rather Than Choosing to Remain at Home, and Who Makes that Decision? *Ageing International*, 34(1), 15-32. doi:10.1007/s12126-009-9034-7

Jung, Y., Peng, W., Moran, M., Jin, S. A., McLaughlin, M., Cody, M., . . . Silverstein, M. (2010). Low-Income Minority Seniors' Enrollment in a Cybercafe: Psychological Barriers to Crossing the Digital Divide. *Educational Gerontology*, 36(3), 193-212. doi:10.1080/03601270903183313

Karasik, R. J. (2010). Ageing In Urban Neighborhoods: Place Attachment And Social Exclusion by Allison E. Smith. *Educational Gerontology*, 36(8), 731-732. doi:10.1080/03601271003744657

Karinkanta, S., Heinonen, A., Sievänen, H., Uusi-Rasi, K., & Kannus, P. (2005). Factors Predicting Dynamic Balance and Quality of Life in Home-Dwelling Elderly Women. *Gerontology*, 51(2), 116-121. doi:10.1159/000082196

Kaup, M. (2009). Life-Span Housing for Aging in Place: Addressing the Home as an Integrated Part of the Solution to Long-Term Care in America. *Seniors Housing & Care Journal*, 17(1), 101-113.

Kennedy, C. (2010). The City of 2050 - An Age-Friendly, Vibrant, Intergenerational Community. *Generations*, 34(3), 70-75.



- Keyes, L., Rader, C., & Berger, C. (2011). Creating Communities: Atlanta's Lifelong Community Initiative. *Physical & Occupational Therapy in Geriatrics*, 29(1), 59-74. doi:10.3109/02703181.2011.552168
- King, S., & Dabelko-Schoeny, H. (2009). "Quite Frankly, I Have Doubts About Remaining": Aging-in-Place and Health Care Access for Rural Midlife and Older Lesbian, Gay, and Bisexual Individuals. *Journal of LGBT Health Research*, 5(1), 10-21. doi:10.1080/15574090903392830
- Kramer, B. J., Vivrette, R. L., & Rubenstein, L. Z. (2011). Engaging Community-Based Organizations in Fall Prevention Education. *Gerontology & Geriatrics Education*, 32(2), 182-196. doi:10.1080/02701960.2011.572209
- Krause, N. (2009). Church-Based Volunteering, Providing Informal Support at Church, and Self-Rated Health in Late Life. *Journal of Aging & Health*, 21(1), 63-84
- Kuang-Hui Chiu, & Yolande Y. Yang. (2010). Remote Monitoring of Health Status of the Elderly at Home in Taiwan. *Telemedicine & e-Health*, 16(6), 717-726.
- Kuei-Min Chen, Ming-Hsien Chen, Shan-Mann Hong, Hui-Chen Chao, Huey-Shyan Lin, & Chun-Huw Li. (2008). Physical Fitness of Older Adults in Senior Activity Centres After 24-week Silver Yoga Exercises. *Journal of Clinical Nursing*, 17(19), 2634-2646. doi:10.1111/j.1365-2702.2008.02338.x
- Lai, O. (2008). The Enigma of Japanese Ageing-in-Place Practice in the Information Age: Does Digital Gadget Help the (Good) Practice for Inter-Generation Care? *Ageing International*, 32(3), 236-255. doi:10.1007/s12126-008-9017-0
- Landorf, C., Brewer, G., & Sheppard, L. A. (2008). The Urban Environment and Sustainable Ageing: Critical Issues and Assessment Indicators. *Local Environment*, 13(6), 497-514. doi:10.1080/13549830802259896
- Late, M. (2010). State Programs Show that Falls Prevention is a Wise Investment. *Nation's Health*, 40(2), 11-11.
- Lauren Hovey, Mary Beth Kaylor, Majd Alwan, & Helaine E. Resnick. (2011). Community-Based Telemonitoring for Hypertension Management: Practical Challenges and Potential Solutions. *Telemedicine & e-Health*, 17(8), 645-651.
- Lehning, A. J. (2012). City Governments and Aging in Place: Community Design, Transportation and Housing Innovation Adoption. *Gerontologist*, 52(3), 345-356.
- Lehning, A., Scharlach, A., & Wolf, J. P. (2012). An Emerging Typology of Community Aging Initiatives. *Journal of Community Practice*, 20(3), 293-316. doi:10.1080/10705422.2012.700175
- Li, S., Wang, C., Lu, W., Lin, Y., & Yen, D. (2012). Design and Implementation of a Telecare Information Platform. *Journal of Medical Systems*, 36(3), 1629-1650. doi:10.1007/s10916-010-9625-6
- Lichtman, J. L., & Lichtman, S. M. (2011). The Older Cancer Survivor: Living Arrangements and Social Supports. *Community Oncology*, 8(1), 32-36. doi:10.1016/S1548-5315(12)70005-0
- Lum, C. (2011). Reflective Dialogues in Community Music Engagement: An Exploratory Experience in a Singapore Nursing Home and Day-Care Centre for Senior Citizens. *International Journal of Community Music*, 4(2), 185-197. doi:10.1386/ijcm.4.2.185\_1
- Maes, B., & Van Puyenbroeck, J. (2008). Adaptation of Flemish Services to Accommodate and Support the Aging of People with Intellectual Disabilities. *Journal of Policy & Practice in Intellectual Disabilities*, 5(4), 245-252. doi:10.1111/j.1741-1130.2008.00185.x
- Mahoney, D. (2011). An Evidence-Based Adoption of Technology Model for Remote Monitoring of Elders' Daily Activities. *Ageing International*, 36(1), 66-81. doi:10.1007/s12126-010-9073-0
- MaloneBeach, E. E., & Langeland, K. L. (2011). Boomers' Prospective Needs for Senior Centers and Related Services: A Survey of Persons 50-59. *Journal of Gerontological Social Work*, 54(1), 116-130. doi:10.1080/01634372.2010.524283
- Manthorpe, J. (2009). Rural Ageing: A Good Place to Grow Old? *Journal of Interprofessional Care*, 23(6), 684-685. doi:10.3109/13561820903251572
- McCaffrey, R. (2008). The Lived Experience of Haitian Older Adults' Integration Into a Senior Center in Southeast Florida. *Journal of Transcultural Nursing*, 19(1), 33-39. doi:10.1177/1043659607309139
- McCall, C., Maynes, B., Zou, C. C., & Zhang, N. J. An Automatic Medication Self-Management and Monitoring System for Independently Living Patients. *Medical Engineering &*

Physics, (0) doi:10.1016/j.medengphy.2012.06.018

McDonough, K. E., & Davitt, J. K. (2011). It Takes a Village: Community Practice, Social Work, and Aging-in-Place. *Journal of Gerontological Social Work*, 54(5), 528-541. doi:10.1080/01634372.2011.581744

McGivney, M. S., Hall, D. L., Stoehr, G. P., & Donegan, T. E. (2011). An Introductory Pharmacy Practice Experience Providing Pharmaceutical Care to Elderly Patients. *American Journal of Pharmaceutical Education*, 75(8), 1-9.

McHugh, K. E. (2006). Ageing and Place: Perspectives, Policy, Practice by Gavin J. Andrews and David R. Phillips, eds. *Professional Geographer*, 58(4), 493-495. doi:10.1111/j.1467-9272.2006.00585\_1.x

Means, R. (2007). Safe as Houses? Ageing in Place and Vulnerable Older People in the UK. *Social Policy & Administration*, 41(1), 65-85. doi:10.1111/j.1467-9515.2007.00539.x

Mennick, F. (2005). Exercise for fall Prevention in Older Adults. *American Journal of Nursing*, 105(10), 20-20.

Metcalf, E. R. (2010). Aging in Place. (cover story). *Saturday Evening Post*, 282(1), 36-36.

Michael, Y. L., Green, M. K., & Farquhar, S. A. (2006). Neighborhood Design and Active Aging. *Health & Place*, 12(4), 734-740. doi:10.1016/j.healthplace.2005.08.002

Michinov, N. (2007). Social Comparison and Affect: A Study Among Elderly Women. *Journal of Social Psychology*, 147(2), 175-189.

Milligan, C., Roberts, C., & Mort, M. (2011). Telecare and Older People: Who Cares Where? *Social Science & Medicine*, 72(3), 347-354. doi:10.1016/j.socscimed.2010.08.014

Moeller, P. (2009). Unique Havens for an Aging America. *U.S. News & World Report*, 146(9), 62-68.

Morgan, D., Innes, A., & Kosteniuk, J. (2011). Dementia Care in Rural and Remote Settings: A Systematic Review of Formal or Paid Care. *Maturitas*, 68(1), 17-33. doi:10.1016/j.maturitas.2010.09.008

Neal, A. (2007). Elder Care: Aging in Place. *Saturday Evening Post*, 279(4), 56-60.

Ney, S. (2005). Active Aging Policy in Europe: Between

Path Dependency and Path Departure. *Ageing International*, 30(4), 325-342.

Northridge, M. E., Nye, A., Zhang, Y. (., Jack, G., & Cohall, A. T. (2011). 'Third Places' for Healthy Aging: Online Opportunities for Health Promotion and Disease Management in Adults in Harlem. *Journal of the American Geriatrics Society*, 59(1), 175-176. doi:10.1111/j.1532-5415.2010.03217.x

Okafor, M. C. (2009). Avenues and Barriers to Access of Services for Immigrant Elders: State and Local Policies for OAA Units on Aging. *Journal of Gerontological Social Work*, 52(5), 555-564. doi:10.1080/01634370902983310

Oken, S. B. (2006). A Community's Response to Aging in Place. *Journal of Jewish Communal Service*, 81(3), 265-267.

Pardasani, M. (2010). Senior Centers: Characteristics of Participants and Nonparticipants. *Activities, Adaptation & Aging*, 34(1), 48-70. doi:10.1080/01924780903552295

Paulo, A. C., Sampaio, A., Santos, N. C., Costa, P. S., Cunha, P., Zihl, J., Sousa, N. (2011). Patterns of Cognitive Performance in Healthy Ageing in Northern Portugal: A Cross-Sectional Analysis. *PLoS ONE*, 6(9), 1-9. doi:10.1371/journal.pone.0024553

Perez, F. R., Fernandez-Mayoralas, G., Rivera, F. E. P., & Abuin, J. M. R. (2001). Ageing in Place: Predictors of the Residential Satisfaction of Ederly. *Social Indicators Research*, 54(2), 173.

Petersson, I., Lilja, M., & Borell, L. (2012). To Feel Safe in Everyday Life at Home – A Study of Older Adults After Home Modifications. *Ageing & Society*, 32(5), 791-811. doi:10.1017/S0144686X11000614

Phillips, J. L., Piza, M., & Ingham, J. (2012). Continuing Professional Development Programmes for Rural Nurses Involved in Palliative Care Delivery: An Integrative Review. *Nurse Education Today*, 32(4), 385-392. doi:10.1016/j.nedt.2011.05.005

Pho, A. T., Tanner, E. K., Roth, J., Greeley, M. E., Dorsey, C. D., & Szanton, S. L. Nursing Strategies for Promoting and Maintaining Function Among Community-Living Older Adults: The CAPABLE Intervention. *Geriatric Nursing*, (0) doi:10.1016/j.gerinurse.2012.04.002

Porter, K. N., Fischer, J. G., & Johnson, M. A. (2011). Improved Physical Function and Physical Activity in Older Adults Following a Community-Based Intervention: Relation-

- ships with a History of Depression. *Maturitas*, 70(3), 290-294. doi:10.1016/j.maturitas.2011.07.024
- Prior, M., Farmer, J., Godden, D. J., & Taylor, J. (2010). More than Health: The Added Value of Health Services in Remote Scotland and Australia. *Health & Place*, 16(6), 1136-1144. doi:10.1016/j.healthplace.2010.07.005
- Pynoos, J., Caraviello, R., & Cicero, C. (2009). LIFELONG HOUSING: The Anchor in Aging-Friendly Communities. *Generations*, 33(2), 26-32.
- Rantz, M. J., Phillips, L., Aud, M., Popejoy, L., Marek, K. D., Hicks, L. L., Miller, S. J. (2011). Evaluation of Aging in Place Model with Home Care Services and Registered Nurse Care Coordination in Senior Housing. *Nursing Outlook*, 59(1), 37-46. doi:10.1016/j.outlook.2010.08.004
- Raza, T., Joshi, M., Schapira, R. M., & Agha, Z. (2009). Pulmonary Telemedicine—A Model to Access the Subspecialist Services in Underserved Rural Areas. *International Journal of Medical Informatics*, 78(1), 53-59. doi:10.1016/j.ij-medinf.2008.07.010
- Rébola, C. B., & Jones, B. (2011). Sympathetic Devices: Communication Technologies for Inclusion. *Physical & Occupational Therapy in Geriatrics*, 29(1), 44-58. doi:10.3109/02703181.2011.555060
- Resnick, B., Luisi, D., & Vogel, A. (2008). Testing the Senior Exercise Self-Efficacy Project (SESEP) for Use with Urban Dwelling Minority Older Adults. *Public Health Nursing*, 25(3), 221-234. doi:10.1111/j.1525-1446.2008.00699.x
- Rioux, L. (2010). Why Do Elderly People Choose to Live in a Community Home? A Study Among French Population. *Bulletin of the Transilvania University of Brasov. Series VII: Social Sciences. Law*, (52), 115-120
- Robinson, A., Lea, E., Hemmings, L., Vosper, G., McCann, D., Weeding, F., & Rumble, R. (2012). Seeking Respite: Issues Around the Use of Day Respite Care for the Carers of People with Dementia. *Ageing & Society*, 32(2), 196-218. doi:10.1017/S0144686X11000195
- The Role of Families in an Ageing Australia. (2003). *Family Matters*, (66), 46-53
- Rolls, L., Seymour, J. E., Froggatt, K. A., & Hanratty, B. (2011). Older People Living Alone at the End of Life in the UK: Research and Policy Challenges. *Palliative Medicine*, 25(6), 650-657. doi:10.1177/0269216310373165
- Roof, K., & Oleru, N. (2008). Public Health: Seattle and King County's Push for the Built Environment. *Journal of Environmental Health*, 71(1), 24-27.
- Russel, M. A., Hill, K. D., Blackberry, I., Day, L. M., & Dharmage, S. C. (2008). The Reliability and Predictive Accuracy of the Falls Risk for Older People in the Community Assessment (FROP-com) tool. *Age & Ageing*, 37(6), 634-639. doi:10.1093/ageing/afn129
- Ryser, L., & Halseth, G. (2012). Resolving Mobility Constraints Impeding Rural Seniors' Access to Regionalized Services. *Journal of Aging & Social Policy*, 24(3), 328-344. doi:10.1080/08959420.2012.683329
- Sabia, J. J. (2008). There's No Place Like Home. *Research on Aging*, 30(1), 3-35.
- Sarma, S., & Simpson, W. (2007). A Panel multinomial Logit Analysis of Elderly Living Arrangements: Evidence from Aging in Manitoba Longitudinal Data, Canada. *Social Science & Medicine*, 65(12), 2539-2552. doi:10.1016/j.socscimed.2007.07.012
- Sassen, B., Selod, S., & Bavaro, K. (2011). Without Walls: Helping Older Adults Age Well in Their Own Communities. *Seniors Housing & Care Journal*, 19(1), 65-72.
- Scharlach, A. (2012). Creating Aging-Friendly Communities in the United States. *Ageing International*, 37(1), 25-38. doi:10.1007/s12126-011-9140-1
- Scharlach, A., Graham, C., & Lehning, A. (2012). The "Village" Model: A Consumer-Driven Approach for Aging in Place. *Gerontologist*, 52(3), 418-427.
- Sereny, M., & Gu, D. (2011). Living Arrangement Concordance and its Association with Self-Rated Health Among Institutionalized and Community-Residing Older Adults in China. *Journal of Cross-Cultural Gerontology*, 26(3), 239-259. doi:10.1007/s10823-011-9145-y
- Shank, B. W., & Herman, W. R. (2006). Geriatric Enrichment: Guaranteeing a Place for Aging in the Curriculum. *Journal of Gerontological Social Work*, 48(1), 63-81.
- Shaw, K., Cartwright, C., & Craig, J. (2011). The Housing and Support Needs of People with an Intellectual Disability

ity into Older Age. *Journal of Intellectual Disability Research*, 55(9), 895-903. doi:10.1111/j.1365-2788.2011.01449.x

Shelley, D., Russell, S., Parikh, N., & Fahs, M. (2011). Ethnic Disparities in Self-Reported Oral Health Status and Access to Care Among Older Adults in NYC. *Journal of Urban Health*, 88(4), 651-662. doi:10.1007/s11524-011-9555-8

Shendell, D. G., Johnson, M. L., Sanders, D. L., Nowakowski, A. C. H., Yang, J., Jeffries, C. D., . . . Moulding, M. (2011). Community Built Environment Factors and Mobility Around Senior Wellness Centers: The Concept of "Safe Senior Zones". *Journal of Environmental Health*, 73(7), 9-18

Shendell, D., & Nowakowski, A. C. H. (2010). Senior Safety Zones: Community Built Environment Factors Around Senior Wellness Centers. *Journal of Public Health Policy*, 31(1), 115-118. doi:10.1057/jphp.2009.44

Shields, W. C., Perry, E. C., Szanton, S. L., McDonald, E. M., Andrews, M. R., Stepnitz, R. L., & Gielen, A. C. Knowledge and Injury Prevention Practices in Homes of Older Adults. *Geriatric Nursing*, (0) doi:10.1016/j.gerinurse.2012.06.010

Shirai, K., Iso, H., Fukuda, H., Toyoda, Y., Takatorige, T., & Tataru, K. (2006). Factors Associated with "Ikigai" Among Members of a Public Temporary Employment Agency for Seniors (Silver Human Resources Centre) in Japan; Gender Differences. *Health & Quality of Life Outcomes*, 4, 12-6. doi:10.1186/1477-7525-4-12

Silver, G., Keefer, J. M., & Rosenfeld, P. (2011). Assisting Patients to Age in Place: An Innovative Pilot Program Utilizing the Patient Centered Care Model (PCCM) in Home Care. *Home Health Care Management & Practice*, 23(6), 446-453. doi:10.1177/1084822311411657

Sixsmith, A., & Sixsmith, J. (2008). Ageing in Place in the United Kingdom. *Ageing International*, 32(3), 219-235. doi:10.1007/s12126-008-9019-y

Skinner, M. W., & Fleuret, S. (2011). Health Geography's Voluntary Turn: A View from Western France. *Health & Place*, 17(1), 33-41. doi:10.1016/j.healthplace.2010.09.002

Skubic, M., Alexander, G., Popescu, M., Rantz, M., & Keller, J. (2009). A Smart Home Application to Eldercare: Current Status and Lessons Learned. *Technology & Health Care*, 17(3), 183-201. doi:10.3233/THC-2009-0551

Smith, T. (2012). A Long Way From Home: Access to Cancer Care for Rural Australians. *Radiography*, 18(1), 38-42. doi:10.1016/j.radi.2011.10.041

Soar, J., Swindell, R., and Tsang, P. (2011). *Intelligent Technologies for Bridging the Grey Digital Divide*. Hersey, New: Information Science Reference.

Sorensen, A. (2006). Liveable Cities in Japan: Population Ageing and Decline as Vectors of Change. *International Planning Studies*, 11(3), 225-242. doi:10.1080/13563470701231703

Sparrow, D., Gottlieb, D. J., DeMolles, D., & Fielding, R. A. (2011). Increases in Muscle Strength and Balance Using a Resistance Training Program Administered Via a Telecommunications System in Older Adults. *Journals of Gerontology Series A: Biological Sciences & Medical Sciences*, 66A(11), 1251-1257.

Spice, C. L., Morotti, W., George, S., Dent, T. H. S., Rose, J., Harris, S., & Gordon, C. J. (2009). The Winchester Falls Project: A Randomised Controlled Trial of Secondary Prevention of Falls in Older People. *Age & Ageing*, 38(1), 33-40. doi:10.1093/ageing/afn192

Stromberg, M. (2005). King County Studies Land Use, Health, and Pollution. *Planning*, 71(11), 52-52.

Swan, J. H., Turner, K., Shashidhara, S., & Sanders, D. (2010). Physical Activity and Senior Centers in Texas. *Texas Public Health Journal*, 62(2), 16-18.

Szanton, S. L., Thorpe, R. J., Boyd, C., Tanner, E. K., Leff, B., Agree, E., . . . Gitlin, L. N. (2011). Community Aging in Place, Advancing Better Living for Elders: A Bio-Behavioral-Environmental Intervention to Improve Function and Health-Related Quality of Life in Disabled older adults. *Journal of the American Geriatrics Society*, 59(12), 2314-2320. doi:10.1111/j.1532-5415.2011.03698.x

Talbott, J., & Roberson, D. N. (2011). Physical Activity of Older People: An Investigation of a Retirement Center in Olo-mouc, Czech Republic. *Activities, Adaptation & Aging*, 35(2), 79-97. doi:10.1080/01924788.2011.572270

Tan, A. C. W., Emmerton, L., Hattingh, L., & Jarvis, V. Medication Supply and Management in Rural Queensland: Views of Key Informants in Health Service Provision. *Research in Social and Administrative Pharmacy*, (0) doi:10.1016/j.sapharm.2011.11.001

- Tang, F., & Lee, Y. (2011). Social Support Networks and Expectations for Aging in Place and Moving. *Research on Aging*, 33(4), 444-464. doi:10.1177/0164027511400631
- Tang, F., & Yeonjung, L. E. E. (2010). Home- and Community-Based Services Utilization and Aging in Place. *Home Health Care Services Quarterly*, 29(3), 138-154. doi:10.1080/01621424.2010.511518
- Taylor-Harris, D., & Zhan, H. J. (2011). The Third-Age African American Seniors: Benefits of Participating in Senior Multipurpose Facilities. *Journal of Gerontological Social Work*, 54(4), 351-371. doi:10.1080/01634372.2010.539588
- Teems, J., Hausman, D. B., Fischer, J. G., Jung Sun, L. E. E., & Johnson, M. A. (2011). Older Adults Attending Georgia Senior Centers Increase Preventive Behaviors for Falls and Fractures Following a Community-Based Intervention. *Journal of Nutrition in Gerontology & Geriatrics*, 30(1), 72-85. doi:10.1080/01639366.2011.545042
- Thanakwang, K., & Soonthorndhada, K. (2011). Mechanisms by Which Social Support Networks Influence Healthy Aging Among Thai Community-Dwelling Elderly. *Journal of Aging & Health*, 23(8), 1352-1378. doi:10.1177/0898264311418503
- Thomas, W. H., & Blanchard, J. M. (2009). Moving Beyond Place: Aging in Community. *Generations*, 33(2), 12-17.
- Townley, S., Papaleontiou, M., Amanfo, L., Henderson, J., Charles R., Pillemer, K., Beissner, K., & Reid, M. C. (2010). Preparing to Implement a Self-Management Program for Back Pain in New York City Senior Centers: What Do Prospective Consumers Think? *Pain Medicine*, 11(3), 405-415. doi:10.1111/j.1526-4637.2009.00783.x
- Truncali, A., Dumanovsky, T., Stollman, H., & Angell, S. Y. (2010). Keep on Track: A Volunteer-Run Community-Based Intervention to Lower Blood Pressure in Older Adults. *Journal of the American Geriatrics Society*, 58(6), 1177-1183. doi:10.1111/j.1532-5415.2010.02874.x
- van den Berg, N., Schumann, M., Kraft, K., & Hoffmann, W. Telemedicine and Telecare for Older Patients—A Systematic Review. *Maturitas*, (0) doi:10.1016/j.maturitas.2012.06.010
- van Hoof, J., Kort, H. S. M., Rutten, P. G. S., & Duijnsteec, M. S. H. (2011). Ageing-in-Place with the Use of Ambient Intelligence Technology: Perspectives of Older Users. *International Journal of Medical Informatics*, 80(5), 310-331. doi:10.1016/j.ijmedinf.2011.02.010
- Vine, D., Buys, L., & Aird, R. (2012). The Use of Amenities in High Density Neighbourhoods by Older Urban Australian Residents. *Landscape and Urban Planning*, 107(2), 159-171. doi:10.1016/j.landurbplan.2012.05.013
- Walsh, K., O'Shea, E., Scharf, T., & Murray, M. Ageing in Changing Community Contexts: Cross-Border Perspectives from Rural Ireland and Northern Ireland. *Journal of Rural Studies*, (0) doi:10.1016/j.jrurstud.2012.01.012
- Wang, Z., & Shepley, M. M. (2008). Site-Level Environmental Support of Active Behavior and Fall Prevention for Seniors. *Seniors Housing & Care Journal*, 16(1), 97-121.
- Warburton, J., Everingham, J., Cuthill, M., Bartlett, H., & Underwood, M. (2011). More Than Just a Talkfest: The Process of Developing Collaborations in Ageing Across Two Different Community Types. *Urban Policy & Research*, 29(2), 183-200. doi:10.1080/08111146.2011.562146
- Watson, S., Zhongxian (Katherine) Zhang, & Wilkinson, T. J. (2010). Nutrition Risk Screening in Community-Living Older People Attending Medical or Falls Prevention Services. *Nutrition & Dietetics*, 67(2), 84-89. doi:10.1111/j.1747-0080.2010.01424.x
- Weeden, A., Remig, V., Holcomb, C. A., Herald, T. J., & Baybutt, R. C. (2010). Vitamin and Mineral Supplements Have a Nutritionally Significant Impact on Micronutrient Intakes of Older Adults Attending Senior Centers. *Journal of Nutrition for the Elderly*, 29(2), 241-254. doi:10.1080/01639366.2010.480897
- Weiner, M. F., Rossetti, H. C., & Harrah, K. (2011). Videoconference Diagnosis and Management of Choctaw Indian Dementia Patients. *Alzheimer's & Dementia*, 7(6), 562-566. doi:10.1016/j.jalz.2011.02.006
- West, D. S., Bursac, Z., Cornell, C. E., Felix, H. C., Fausett, J. K., Krukowski, R. A., . . . Beck, C. (2011). Lay Health Educators Translate a Weight-Loss Intervention in Senior Centers: A Randomized Controlled Trial. *American Journal of Preventive Medicine*, 41(4), 385-391. doi:10.1016/j.amepre.2011.06.041
- Whitney, J., Vernon, S., Hughes, J., & Kinirons, M. (2006). Introducing Exercise Classes for Older Care Home Residents. *Journal of Interprofessional Care*, 20(3), 317-319. doi:10.1080/13561820600725662









THE UNIVERSITY  
of NORTH CAROLINA  
at CHAPEL HILL

KENAN-FLAGLER  
BUSINESS SCHOOL

*Founded in 1985, the Frank Hawkins Kenan Institute of Private Enterprise pursues leading-edge programming and research in the areas of entrepreneurship, economic development, and global competitiveness. It is part of Kenan-Flagler Business School at The University of North Carolina at Chapel Hill.*

CB 3440, Kenan Center  
Chapel Hill, NC 27599-3440  
Telephone: 929-962-8201

Email: [kenan\\_institute@unc.edu](mailto:kenan_institute@unc.edu)  
[www.kenaninstitute.unc.edu](http://www.kenaninstitute.unc.edu)

---

THE DUKE ENDOWMENT

---

*The Duke Endowment in Charlotte, North Carolina, is a private foundation established in 1924 by industrialist and philanthropist James B. Duke. We seek to fulfill his dream for the Carolinas by enriching lives and communities through children's services, health care, higher education and rural churches. Mr. Duke's legacy endures today in every life touched, every institution advanced and every innovation discovered.*

100 North Tryon Street, Suite 3500  
Charlotte, NC 28202-4012  
Telephone: 704-376-0291

Email: [infotde@tde.org](mailto:infotde@tde.org)  
[www.dukeendowment.org](http://www.dukeendowment.org)