



Northwestern

# THE AGE WELL STUDY:

Investigating Factors Associated with Healthy Behaviors & Health Outcomes in Residents of Life Plan Communities

YEAR 2 REPORT

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# INTRODUCTORY LETTER

Dear Colleague,

You may be aware that Year 1 of the five-year Age Well Study revealed that Life Plan Community residents report relatively high levels of health and wellness compared to older adults in the community at large. Here, the findings from Year 2 of the study take a closer look at resident wellness, revealing specific personality traits and other characteristics that are associated with healthy behaviors and overall health of residents.

It is our hope that, by identifying factors related to greater resident wellness, senior living providers can use these findings to guide them in developing or customizing programs and resources to support resident wellness.

Thank you to the Life Plan Communities and the more than 5,700 residents who participated in the Year 2 study. And thank you, too, to our valued research partners: Northwestern University, ASHA, LeadingAge, Ziegler, Novare, Life Care Services, and National Investment Center.

Regards,



Mary Leary  
CEO and President  
Mather

PS: If you haven't read the Year 1 report, I encourage you to look it over. You can download it from [TheAgeWellStudy.com](https://TheAgeWellStudy.com).



## KEY FINDINGS



122

LIFE PLAN COMMUNITIES  
AROUND THE US PARTICIPATED  
IN THE STUDY

5,777

LIFE PLAN COMMUNITY RESIDENTS  
PARTICIPATED IN THE STUDY

The main purpose of the five-year Age Well Study is to assess the impact of residing in a Life Plan Community on residents' health and wellness over time. Each year, analyses are conducted to better understand this impact, as well as to identify factors among residents and Life Plan Communities that may affect health and wellness. In Year 2 of the study, analyses focus on investigating factors that may be associated with healthy behaviors and health outcomes among residents.

Year 2 study findings are based on responses from 5,777 residents from 122 Life Plan Communities across the United States. Life Plan Communities with at least 100 residents residing in independent living were eligible to enroll, and residents residing in independent living at participating organizations were invited to participate in the study. Residents completed surveys that assessed their health and wellness as well as other individual characteristics, while staff completed surveys to gather data on organizational characteristics. Year 2 of the Age Well Study survey was administered from January to April 2019.

Analyses examined the relationship between resident characteristics (i.e., personality traits, personal resources, and social/communal factors) organizational characteristics, engagement in healthy behaviors, and health outcomes.

**Healthy behaviors included:**

- physical activity
- social activity
- diet
- meditation/contemplation

**Health outcomes included:**

- self-reported health
- stress

Analyses controlled for the effects of residents' age, gender, income, education, marital status, depressive symptoms, number of chronic health conditions, and length of residence.

Table 1 summarizes findings in relation to the four categories of factors examined (personality, personal resources, communal factors, and organizational factors), as well as healthy behaviors.

**Table 1. Factors Associated with Healthy Behaviors among Residents of Life Plan Communities**

	Physical Activity (overall)	Social Activity (overall)	Healthy Diet	Meditation/ Personal Contemplation
<b>Personality</b>				
More open to experience		↑	↑	
More conscientious	↑	↓	↑	↑
More extroverted	↑	↑	↑	
More agreeable	↓	↑		↑
More neurotic			↓	↑
<b>Personal Resources</b>				
Higher optimism		↑	↑	↑
Higher perceived control	↑	↑	↑	↓
Greater purpose	↑	↑	↑	↑
More positive perceptions of aging	↑		↑	
Higher resilience			↑	↓
<b>Communal Factors</b>				
Higher loneliness		↓	↓	
Greater social cohesion	↑	↑		↑
Greater community belonging			↑	
Higher religiosity			↓	↑
Higher spirituality	↑		↑	↑
<b>Organizational Factors</b>				
Religious affiliation				↑
Non-religious affiliation				↓
Number of amenities	↑			
Region		S > MW		S/MW > W

■ Positive Outcomes  
■ Negative Outcomes

Notes: Direction of arrows indicates an increase (↑) or decrease (↓) in the behavior or health outcome in relation to the predictors in the left column. Since behaviors and health outcomes may be positive (e.g., healthy diet) or negative (e.g., stress), colors highlight positive (teal) or negative (orange) outcomes. For example, residents who are more open to experiences, have more social activity and healthier diets. Year 2 findings demonstrate that various personality characteristics, personal resources, and social/communal factors are associated with resident participation in healthy behaviors and health outcomes. Very few organizational characteristics were related to such participation or outcomes; there were no observed effects of profit status, number of sites (single or multiple), fee structure, or area type (urban, suburban, rural).

Regarding geographic regions, S=South, MW=Midwest, W=West. Northeast (NE) is not included in these results as there were no differences between NE and other regions for these outcomes. See Appendix B for a map of geographic regions.



## BACKGROUND & SIGNIFICANCE



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**Residents of Life Plan Communities tend to have greater emotional, social, physical, intellectual, and vocational wellness, but lower spiritual wellness.**

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The Age Well Study is a longitudinal, nationwide study exploring the impact of residing in a Life Plan Community on residents' health and wellness. Year 1 of the five-year Age Well Study provided a comprehensive portrait of health and wellness for residents of Life Plan Communities (Mather Institute, 2018). The analysis demonstrated that, compared to older adults in the community at large, residents of Life Plan Communities tend to have greater emotional, social, physical, intellectual, and vocational wellness, but lower spiritual wellness. In Year 2, the study provides a deeper understanding of resident health and wellness by focusing on health and healthy behaviors and their association with resident characteristics and organizational factors.

It is well established that individual healthy behaviors are strong determinants of health and well-being (McGovern, Miller, & Hughes-Cromwick, 2014; Peel, McClure, & Bartlett, 2005). Year 2 of the study examined residents' physical activity, social activity, diet, and meditation/personal contemplation. Among older adults, physical activity is associated with psychological well-being (Netz, Wu, Becker, & Tenenbaum, 2005), reduced risk of chronic disease (Soares-Miranda, Siscovick, Psaty, Longstreth, & Mozaffarian, 2016; Warburton, Nicol, & Bredin, 2006), and functional independence (Paterson & Warburton, 2010). Healthy diets are associated with better outcomes as well, including reduced risk of chronic disease and death among older adults (Nowson, Appleton, & Grieger, 2018; Reedy et al., 2014). Social activity also provides numerous benefits, including protection against dementia and reduced risk of mortality (Kuiper et al., 2015; Holt-Lunstad, Smith, & Layton, 2010). Finally, meditation is associated with decreased anxiety and depression (Geiger et al., 2016).



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**This study is unique in that it examines a diverse set of factors and their relationship to healthy behaviors among a large sample of older adults residing in Life Plan Communities.**

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However, despite considerable evidence of the benefits of healthy behaviors, many people struggle to adopt and maintain them. For example, more than one-half of older adults do not consume the recommended amount of fruit and vegetables for a healthy diet (Lee-Kwan, Moore, Blanck, Harris, & Gauska, 2017), and more than one-third of adults age 75 and older are physically inactive (Watson, 2016). This is because healthy behaviors are complex and influenced by multiple factors (McGinnis, Williams-Russo, & Knickman, 2002; McGovern et al., 2014). Individual, interpersonal, community, and societal factors all shape healthy behaviors. This study examined individual and community factors that may relate to healthy behaviors, including personality, personal resources (e.g., optimism), social/communal factors (e.g., social cohesion and religiosity), and Life Plan Community organizational factors (e.g., neighborhood area type and number of amenities).

In addition to healthy behaviors, this report examines how the aforementioned individual and community characteristics are related to self-reported health and stress, a significant factor in health. Decades of research show that self-rated health, a measure of perceived health, is a robust and consistent predictor of mortality (Benyamini & Idler, 1999; Christian et al., 2011), as well as functional decline (Martinez, Kasl, Gill, & Barry, 2009), and chronic disease (Lima-Costa, Cesar, Chor & Proietti, 2011). Perceived stress, the perception that one is unable to cope with a given situation, influences the risk of many health conditions, including asthma, cardiovascular disease, stroke, anxiety, and depression (Slavich, 2016).

While a few studies have examined health and healthy behaviors among residents of Life Plan Communities, this study is unique in that it examines a diverse set of factors (psychological, demographic, and social) and their relationship to healthy behaviors among a large sample of older adults residing in Life Plan Communities. Thus, Year 2 of the Age Well Study addresses a gap in the literature and extends our understanding of health and healthy behaviors among older adults. The results of this study can be used by senior living professionals to develop strategies aimed at improving residents' health.



## STUDY OVERVIEW & METHODOLOGY



The Age Well Study is designed to help providers and residents better understand the impact of living in a Life Plan Community on residents' health and wellness. In addition, this study seeks to identify which organizational factors, such as size or amenities, are associated with more positive resident health outcomes.

The Age Well Study includes four main components:

- 1) self-administered organizational surveys completed by one staff member from each participating Life Plan Community,
- 2) self-administered surveys completed annually by residents of Life Plan Communities for five years,
- 3) semi-structured interviews with a subset of residents from three communities conducted once a year for two years, and
- 4) secondary data analysis with a comparison sample of older adults living in the community at large.

Together, these components provide multiple sources of data to assess objective questions of health and wellness and enable a closer examination of residents' experiences. This report describes the results of an analysis of survey responses from Year 2.

## STUDY ELIGIBILITY & RECRUITMENT

The Year 1 report on the Age Well Study provides a detailed overview of the initial study eligibility and recruitment procedures.

**LIFE PLAN COMMUNITIES.** Organizations were eligible to participate if they reported being a Life Plan Community with at least 100 residents residing in independent living. Life Plan Community was defined as a residence providing at least independent living and skilled nursing care, following the National Investment Center definition. All 80 organizations that participated in Year 1 continued to participate in Year 2, and 42 additional organizations were enrolled for Year 2 using the same procedures outlined in the Year 1 report. Thus, a total of 122 eligible organizations returned completed resident surveys. A staff member knowledgeable about the characteristics of the community completed an online survey designed to gather organizational details, such as number of residents, location, for-profit vs. nonprofit status, amenities, and services. Each participating organization completed a Year 2 organizational survey; for two Life Plan Communities missing Year 2 organizational data, their Year 1 organizational survey responses were used.

**RESIDENTS.** All individuals who resided in independent living at participating Life Plan Communities were eligible to participate in the Year 2 survey. The 4,668 respondents from Year 1 who provided viable contact information received a recruitment letter directly from the Principal Investigator, followed by the survey packet and reminder postcards. Organizations that enrolled in Year 1 were provided with extra surveys in case additional residents wanted to enroll in the study. In addition, all individuals who resided in independent living at Life Plan Communities that enrolled in Year 2 were eligible to participate. At newly enrolled Life Plan Communities, staff distributed recruitment flyers and made announcements about the survey at information sessions or other gatherings. A total of 5,992 Year 2 resident surveys were submitted. These were screened for adherence to the eligibility criteria and degree of completion. Of the 5,992 surveys, 145 were excluded because respondents submitted duplicate surveys (n = 78), completed less than 70% of the survey items (n = 45), did not live at an enrolled Life Plan Community (n = 21), or the participant withdrew from the study for health reasons (n = 1). Analyses included responses from 5,777 Life Plan

Community residents, for an overall response rate of 35%. This included 2,699 respondents enrolled in Year 1, and the retention rate for Year 1 respondents, with viable contact information, was 58%. A total of 3,078 respondents were newly enrolled in Year 2, including 210 new respondents from communities that enrolled during Year 1.

## SURVEY DEVELOPMENT

The organizational and resident surveys were developed by Mather Institute with input from an advisory group. In order to compare residents of Life Plan Communities with older adults from the community at large, many of the psychosocial and health measures on the resident survey were drawn from a comparative sample from the Health and Retirement Study (HRS), a longitudinal survey that includes more than 22,000 Americans over the age of 50. Prior to implementation, the survey was reviewed with several residents of Life Plan Communities to identify areas of ambiguity and improve clarity. For a list of specific measures surveyed, see Appendix A.

## STATISTICAL ANALYSES

Averages (mean scores) or percentages are presented for select wellness outcomes. Percentages are rounded to the nearest whole number, and thus total percentages may not always add up to 100%.

A statistical procedure called multilevel modeling was used to test the associations among organizational and respondent characteristics and wellness outcomes. Survey responses from residents of the same Life Plan Community are likely to have more in common with each other than with responses from residents of other Life Plan Communities due to shared living environments. Multilevel modeling accounts for this clustering in the data, i.e., individual residents within their respective Life Plan Communities, so that results do not assume that resident experiences in all Life Plan Communities are equal. Statistical significance was set at a p-value of less than .05 ( $p < .05$ ), which indicates that there is less than a 5% likelihood that the effect is due to chance. Also, analyses test for correlations between organizational/respondent characteristics



and wellness outcomes; direction of causality (that a specific characteristic directly causes an outcome of interest) cannot be conclusively determined from these results. This is discussed further in the Caveats section.

Four sets of multilevel analyses were conducted to examine the relationship between resident characteristics (i.e., personality characteristics, personal/psychological resources, social/communal factors), and organizational characteristics, and engagement in healthy behaviors. Healthy behaviors included physical activity, social activity, diet, and meditation/contemplation. Analyses controlled for the effects of residents' age, gender, income, education, marital status, depressive symptoms, number of chronic health conditions, and length of residence. Analyses addressed the following questions:

- 1) **WHAT IS THE RELATIONSHIP BETWEEN RESIDENTS' PERSONALITY AND THEIR HEALTHY BEHAVIORS?**  
The personality traits included openness to experience, conscientiousness, extroversion, agreeableness, and neuroticism.
- 2) **TO WHAT EXTENT ARE PERSONAL RESOURCES, INCLUDING OPTIMISM, PERCEIVED CONTROL, SENSE OF PURPOSE, POSITIVE VIEWS OF AGING, AND RESILIENCE, ASSOCIATED WITH HEALTHY BEHAVIORS OF RESIDENTS OF LIFE PLAN COMMUNITIES?**
- 3) **WHAT IS THE ASSOCIATION BETWEEN RESIDENTS' SENSE OF CONNECTION AND THEIR HEALTHY BEHAVIORS?**  
Analyses included measures of social connections with others (i.e., loneliness, social cohesion, and community belonging) as well as measures of spiritual connections (i.e., religiosity and spirituality).
- 4) **WHAT ORGANIZATIONAL CHARACTERISTICS ARE ASSOCIATED WITH RESIDENT HEALTHY BEHAVIORS?**  
These analyses included profit status, single-site vs. communities whose parent organization has other communities, fee structure, religious affiliation, neighborhood area type, number of residents in independent living, number of amenities provided for residents, and geographic region as predictors of healthy behaviors.

Note: In observational studies, "controlling for" a variable during analysis is the attempt to eliminate any effect of other extraneous variables that may affect the outcome. For example, in assessing the relationship between personality and health outcomes, income is controlled for, among other factors, because income has been shown to be related to better health. Additional factors that were controlled for include age, gender, education, marital status, depressive symptoms, chronic health conditions, and length of residence in the community. The analysis allows examination of the relationship between a variety of characteristics (personality, personal resources, social/communal, and organizational) and healthy behaviors or health outcomes, independent of any influence these other control variables may have. The effects of these control variables on healthy behaviors and health outcomes are included separately in the Detailed Findings section.



## DESCRIPTION OF STUDY PARTICIPANTS

The table below describes organizational characteristics reported by participating Life Plan Community staff representatives.

**Table 2. Organizational Characteristics**

<b>Number of organization respondents</b>	122	<b>Community size</b>		<b>Region<sup>3</sup></b>	
<b>Profit status</b>		1–300 residents in independent living	50%	South	38%
Not-for-profit	80%	301+ residents in independent living	50%	Northeast	22%
For-profit	20%			Midwest	20%
		<b>Levels of care</b>		West	20%
<b>Fee structure</b>		Independent living	100%	<b>Average age of residents</b>	
Entrance fee	90%	Assisted living	93%	Younger than 80	5%
No entrance fee	10%	Skilled nursing	99% <sup>2</sup>	80 to 84	56%
		Memory support	84%	85 or better	39%
<b>Religious affiliation</b>		Home care	49%		
No religious affiliation	70%	Hospice	24%	<b>Age of community</b>	
Religious affiliation	30%	Adult day program	9%	Less than 10 years	4%
				10 to 19 years	30%
<b>Number of communities</b>		<b>Community location</b>		20 to 29 years	16%
Single-site	52%	Suburban	63%	30 to 39 years	20%
Multisite <sup>1</sup>	48%	Urban	21%	40 to 49 years	7%
		Rural	16%	50 years and greater	22%

1 Communities whose parent organization has other communities

2 One community provides skilled nursing immediately adjacent to the community

3 See Appendix B for a map of geographic regions.

Category totals may not sum to 100% due to rounding.





Table 3 on page 18 describes demographic characteristics of residents of Life Plan Communities who participated in Year 2 of the Age Well Study. Certain categories of responses (such as the “Other” Race category combining American Indian, East Asian, and South/Southeast Asian) continue to match categories from the Health and Retirement Study (HRS) that provided comparison data for the Age Well Study Year 1 report. Category totals may not sum to 100% due to rounding. The distribution of individual respondents vs. organizations within each category may be different due to individual (e.g., younger participants may be more likely to participate) or organizational (e.g., larger communities may be overrepresented) factors.

**Table 3. Respondent Characteristics**

<b>Number of respondents</b>	<b>5,777</b>
<b>Age</b>	
Younger than 80	25%
80 to 84	27%
85 or better	47%
Not reported	<1%
<b>Gender</b>	
Female	66%
Male	33%
Not reported	<1%
<b>Ethnicity</b>	
Hispanic/Latino	<1%
Not Hispanic/Latino	98%
Not reported	1%
<b>Race</b>	
White/Caucasian	97%
Black/African American	<1%
Other	2%
Not Reported	<1%

<b>Marital status</b>	
Married	51%
Widowed	39%
Divorced	5%
Never married	4%
Partnered	1%
Separated	<1%
Not reported	<1%

<b>Education</b>	
No degree	<1%
GED	<1%
High school	12%
Associate's degree	8%
Bachelor's degree	32%
Master's degree	28%
Doctorate degree	15%
Other	3%
Not reported	<1%

<b>Religious preference</b>	
Protestant	57%
Catholic	15%
Jewish	7%
None/No preference	13%
Other	7%
Not Reported	1%

<b>Household income (gross)</b>	
Less than \$20,000	1%
\$20,000 to less than \$40,000	6%
\$40,000 to less than \$60,000	9%
\$60,000 to less than \$80,000	11%
\$80,000 to less than \$100,000	12%
\$100,000 to less than \$120,000	13%
\$120,000 to less than \$140,000	7%
\$140,000 to less than \$160,000	5%
\$160,000 or more	18%
Not reported	17%

<b>Region</b>	
South	35%
Midwest	26%
West	23%
Northeast	17%



**DETAILED FINDINGS**



### STUDY RESULTS ARE PRESENTED IN SIX SECTIONS:

1. Personality
2. Personal and psychological resources
3. Social and communal factors
4. Organizational factors
5. Demographic and other personal factors
6. Barriers to physical activity

Each of the first five sections provides descriptions of factors that may affect health behaviors and outcomes, followed by the study findings and a discussion of those findings. For example, in the first section, personality traits are described, followed by Age Well Study findings related to personality and a brief discussion of those findings.

# PERSONALITY

Personality is often described by five core traits: openness, conscientiousness, extroversion, agreeableness, and neuroticism.

Personality is often described by five core traits. Commonly called the Big Five by psychologists, the traits are **openness**, **conscientiousness**, **extroversion**, **agreeableness**, and **neuroticism**. These patterns of behavior, feelings, and thoughts have complex genetic and environmental origins, and tend to be fairly stable throughout our lives. Personality helps to shape various aspects of life, including health and health behavior (Strickhouser, Zell, & Kirzan, 2017).

Age Well Study findings related to personality are presented in Tables 4 and 5. Table 4 shows the relationship between personality traits and healthy behaviors, while Table 5 shows the relationship between personality traits and health outcomes.

**Table 4. Relationship between Personality Traits and Healthy Behaviors**

	Physical Activity (overall)	Social Activity (overall)	Healthy Diet	Meditation/ Personal Contemplation
More open to experience		↑	↑	
More conscientious	↑	↓	↑	↑
More extroverted	↑	↑	↑	
More agreeable	↓	↑		↑
More neurotic			↓	↑

■ Positive Outcomes  
■ Negative Outcomes

**Table 5. Relationship between Personality Traits and Health Outcomes**

	Self-Reported Health	Stress
More open to experience	↑	↓
More conscientious	↑	↓
More extroverted	↑	↓
More agreeable	↓	↓
More neurotic	↓	↑

■ Positive Outcomes  
■ Negative Outcomes

Note: Direction of arrows indicates an increase (↑) or decrease (↓) in the behavior or health outcome in relation to the predictors in the left column. Since behaviors and health outcomes may be positive (e.g., healthy diet) or negative (e.g., stress), colors highlight positive (teal) or negative (orange) outcomes.

- OPENNESS TO EXPERIENCE:** Persons with high levels of **openness** typically like new experiences, have active imaginations, appreciate beauty, enjoy intellectual activities, and are in touch with their feelings. Residents who are more open to new experiences are more socially active and eat healthier diets. They also report better overall health (see Figure 1 for Age Well participants’ self-reported health scores) and lower overall stress.
- CONSCIENTIOUSNESS:** Very **conscientious** individuals have high levels of discipline and dependability. They are typically detail-oriented, organized, and tend to plan ahead. More conscientious residents are more physically active, eat healthier diets, and spend more time on meditation or personal contemplation. They also report better overall health and lower overall stress. However, more conscientious residents are less socially active.
- EXTROVERSION:** Individuals who are highly **extroverted** are likely to be outgoing, talkative, and enjoy being the center of attention. More extroverted residents are more physically active, more socially active, and eat healthier diets. Extroverts also report better overall health and lower overall stress.
- AGREEABLENESS:** **Agreeableness** refers to the extent that persons value getting along with others. Agreeable individuals are generally empathic, helpful, and generous. More agreeable residents are more socially active. They are more likely to spend time on meditation or personal contemplation and report lower overall stress in their lives. However, more agreeable residents are less physically active, and report worse overall health.

- **NEUROTICISM:** Persons with high levels of **neuroticism** often experience negative moods, such as feeling anxious, sad, or angry. More neurotic residents spend more time on meditation or personal contemplation. However, they eat less healthy diets. They also report worse overall health and higher overall stress in their lives.

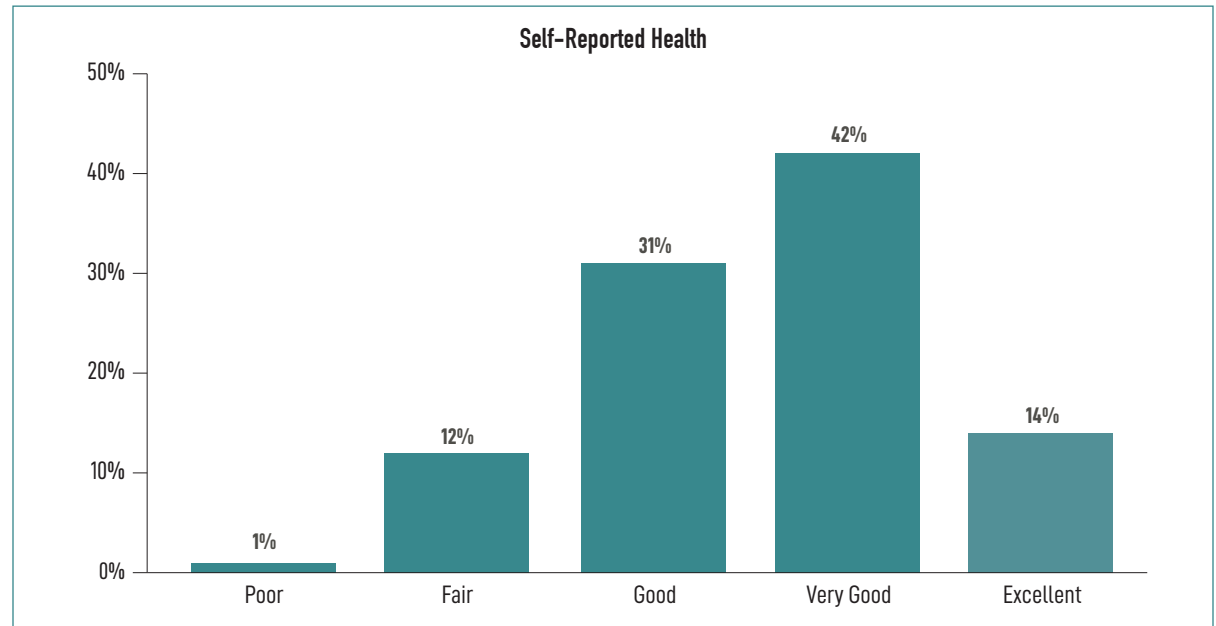
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...participants' higher scores on the personality traits of openness to experience and extroversion are associated with increased healthy behaviors and more positive health outcomes.

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**Figure 1. Age Well Study Participants' Self-Reported Health**

When asked "How would you describe your health?", more than one-half (56%) of respondents said "Very Good" or "Excellent."



In keeping with previous research (Brummett, Siegler, Day, & Costa, 2008; Goodwin & Engstrom, 2002; Gilbert, 1995; James, Wilson, Barnes & Bennett, 2011), Age Well Study participants' higher scores on the personality traits of **openness to experience** and **extroversion** are associated with increased healthy behaviors and more positive health outcomes. In contrast, higher **neuroticism** was linked to fewer healthy behaviors and worse health outcomes, findings that are supported by prior studies (Goodwin & Engstrom, 2002; Goodwin & Hamilton, 2002). While participants higher in **neuroticism** spend more time on meditation or personal contemplation (generally



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**Participants higher in conscientiousness generally report more healthy behaviors and better health outcomes...**

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considered a healthy behavior), such activities might manifest as rumination focused on negative emotions or experiences. More neurotic individuals may be more sensitive to experiencing such negative feelings and thus more likely to ruminate, as suggested by previous studies (e.g., Roberts, Gilboa, & Gotlib, 1998).

The traits of **conscientiousness** and **agreeableness** have mixed relationships with healthy behaviors and outcomes. Participants higher in **conscientiousness** generally report more healthy behaviors and better health outcomes, but they are less socially active. This latter finding is somewhat surprising since previous research on conscientiousness has demonstrated a connection between perceived social support and increased conscientiousness in older adults (Hill, Payne, Jackson, Stine-Morrow, & Roberts, 2013).

More **agreeable** participants have the most mixed outcomes. They are more socially active, but less physically active, and report lower overall stress in their lives, but worse overall health, compared to participants with less **agreeable** personalities. While some past research suggests a connection between higher **agreeableness** and positive health outcomes (Goodwin & Engstrom, 2002; Möttus et al., 2011), some of these findings are mixed, and results suggest a weaker relationship between agreeableness and health outcomes, compared to other personality traits. For example, Goodwin and Engstrom (2002) found an association between higher **agreeableness** and perception of good health, but this was only the case for participants with self-reported medical problems; there was no such relationship for participants without medical problems. Thus, similar to **conscientiousness**, **agreeableness** may have a more complex relationship with health outcomes that requires further study.



# PERSONAL/PSYCHOLOGICAL RESOURCES

Personal/psychological resources play an important role in well-being. A large body of research demonstrates the relationship between psychological characteristics and health. Increased optimism, perceived control, purpose in life, positive perceptions of aging, and resilience have each been associated with positive health outcomes in prior studies (Cohen, Bavishi, & Rozanski, 2016; Jacelon, 2007; Sargent-Cox, Anstey, & Luszcz, 2012; Smith & Hollinger-Smith, 2015; Windsor, Curtis, & Luszcz, 2015; Wurm, Tesch-Römer, & Tomasik, 2007; Zeng & Shen, 2010).

Age Well Study findings on personal resources are displayed in Tables 6 and 7. Table 6 depicts the relationship between personal resources and healthy behaviors, while Table 7 shows the relationship between personal resources and health outcomes.

**Table 6. Relationship between Personal Resources and Healthy Behaviors**

	Physical Activity (overall)	Social Activity (overall)	Healthy Diet	Meditation/ Personal Contemplation
<b>Personal Resources</b>				
Higher optimism		↑	↑	↑
Higher perceived control	↑	↑	↑	↓
Greater purpose	↑	↑	↑	↑
More positive perceptions of aging	↑		↑	
Higher resilience			↑	↓

■ Positive Outcomes  
■ Negative Outcomes



**Table 7. Relationship between Personal Resources and Health Outcomes**

	Self-Reported Health	Stress
Higher optimism	↑	↓
Higher perceived control	↑	↓
Greater purpose		↓
More positive perceptions of aging	↑	↓
Higher resilience		↓

■ Positive Outcomes  
■ Negative Outcomes

Note: Direction of arrows indicates an increase (↑) or decrease (↓) in the behavior or health outcome in relation to the predictors in the left column. Since behaviors and health outcomes may be positive (e.g., healthy diet) or negative (e.g., stress), colors highlight positive (teal) or negative (orange) outcomes.

- **OPTIMISM:** Optimism refers to the extent to which people expect good things to happen. More optimistic residents are more socially active, eat healthier diets, and spend more time on meditation or personal contemplation. They also report better overall health and less stress in their lives.
- **PERCEIVED CONTROL:** Perceived control describes beliefs about one’s ability to influence one’s life. Residents with a higher sense of perceived control over their lives are more physically and socially active and eat healthier diets. They also report better overall health and lower overall stress. However, they spend less time on meditation or personal contemplation.
- **PURPOSE:** Purpose in life describes the degree to which one feels one’s life is useful, has direction, and is meaningful. Residents with a greater sense of purpose in their lives are more physically and socially active and eat healthier diets. They are more likely to spend time on meditation or personal contemplation. They also report lower overall stress in their lives.
- **PERCEPTIONS OF AGING:** Perceptions of aging reflect one’s outlook, individual experiences, and internalized stereotypes about getting older (Levy, 2003). Residents with more positive perceptions of aging are more physically active and eat healthier diets. They also report better overall health and lower overall stress.
- **RESILIENCE:** Resilience is a process that allows an individual to recover from or adapt to adversity. Residents with greater resilience eat healthier diets. They report lower overall stress. However, they are less likely to spend time on meditation or personal contemplation.

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**Stronger psychological resources were generally linked to increased healthy behaviors and better health outcomes.**

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As with prior research, stronger psychological resources were generally linked to increased healthy behaviors and better health outcomes. Higher scores on all five resources examined were linked to healthier diets and lower overall stress. For other outcomes, there is some variation in which resources are associated with each outcome, suggesting that any benefits of improved psychological resources might be outcome-specific. In some cases, this is unexpected. For example, though previous studies have linked **resilience** with increased longevity and reduced risk of mortality (Zeng & Shen, 2010; Shen & Zeng, 2011), there was no relationship between **resilience** and self-reported health among Age Well Study participants. Similarly, there was no relationship between greater **purpose in life** and self-reported health, although there is evidence of a relationship between a higher sense of **purpose in life** and reduced risk of many health conditions (Boyle, Buchman, Barnes, & Bennett, 2010; Kim, Sun, Park, & Peterson, 2013).

Individuals with a higher sense of **perceived control** and greater **resilience** report spending less time engaging in meditation or personal contemplation. It is unclear why this is the case, although one possible explanation may be that **perceived control**, **resilience**, and mindfulness activities such as meditation offer beneficial but overlapping advantages for health and wellness. For example, when confronting stressful situations, individuals with unusually high personal **resilience** may not experience much stress at all, while others may be more affected by stress and find meditation exercises an attractive method for alleviating negative feelings.

# SOCIAL/COMMUNAL FACTORS

Social and communal factors reveal information about connections with others, the community, and a sense of spiritual connection or connection with a higher power. Social ties are important for well-being, but can be harder to maintain with age. As such, social and communal factors are particularly important areas of research for older adults. Prior research findings suggest that loneliness, social cohesion, community belonging, religiosity, and spirituality each contribute to health outcomes.

Age Well Study findings related to social/communal factors are depicted in Tables 8 and 9. Table 8 describes the relationship between social/communal factors and healthy behaviors. Table 9 describes the relationship between these factors and health outcomes. Figure 2 illustrates Age Well participants’ overall social activity by type of activity (in-person meet-ups, by phone, by written letters/emails, and on social media).

**Table 8. Relationship between Social/Communal Factors and Healthy Behaviors**

	Physical Activity (overall)	Social Activity (overall)	Healthy Diet	Meditation/ Personal Contemplation
<b>Communal Factors</b>				
Higher loneliness		↓	↓	
Greater social cohesion	↑	↑		↑
Greater community belonging			↑	
Higher religiosity			↓	↑
Higher spirituality	↑		↑	↑

■ Positive Outcomes  
■ Negative Outcomes

More spiritual people are more physically active, and they eat healthier diets.

**Table 9. Relationship between Social/Communal Factors and Health Outcomes**

	Self-Reported Health	Stress
Higher loneliness		↑
Greater social cohesion	↑	
Greater community belonging	↑	↓
Higher religiosity		
Higher spirituality	↑	↓

■ Positive Outcomes  
■ Negative Outcomes

Note: Direction of arrows indicates an increase (↑) or decrease (↓) in the behavior or health outcome in relation to the predictors in the left column. Since behaviors and health outcomes may be positive (e.g., healthy diet) or negative (e.g., stress), colors highlight positive (teal) or negative (orange) outcomes.

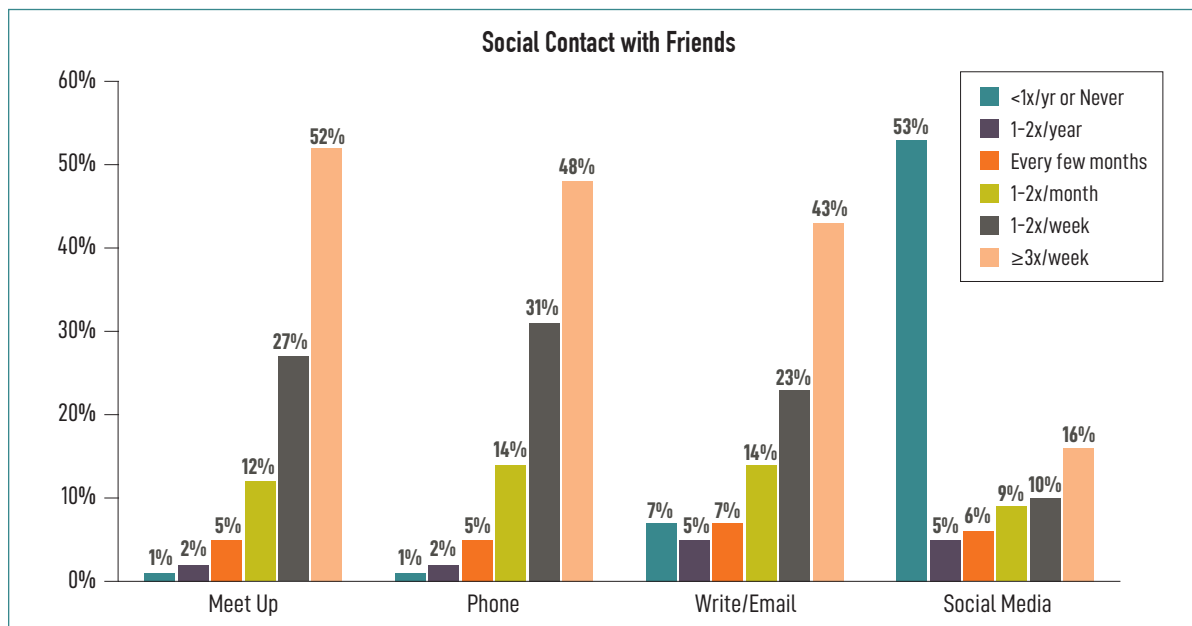
- **LONELINESS:** Loneliness is the perception of inadequate social contact, including a desire for closer relationships. Lonelier residents are less socially active, eat less healthy diets, and report having more stress in their lives.
- **SOCIAL COHESION:** Social cohesion relates to the degree to which members of a community feel connected, trust each other, and work together. Residents with a greater sense of social cohesion in their living environments are more physically active, more socially active, and spend more time on meditation or personal contemplation. They also report better overall health.
- **COMMUNITY BELONGING:** Community belonging conveys the attachment individuals feel to their community and the sense that they belong or feel similar to others. Residents with a greater sense of community belonging eat healthier diets, and they spend more time on meditation or personal contemplation. They also report better overall health and less stress in their lives.
- **RELIGIOSITY:** Religiosity is the adherence to an organized system of beliefs and practices related to a higher power and community. More religious residents spend more time on meditation or personal contemplation, which may include prayer or other religious activity. However, they eat less healthy diets.
- **SPIRITUALITY:** Spirituality involves the personal seeking of answers about meaning and the relationship to a higher power that may be independent from religion (Koenig, 2000). More spiritual people are more physically active, and they eat healthier diets. They spend more time on meditation or personal contemplation. They also report better overall health, and lower overall stress.



Compared to personality traits and psychological resources, there were fewer significant associations between social/communal factors and healthy behaviors and health outcomes. Increased feelings of **loneliness**—for which older adults may be at higher risk than younger populations—were related to less frequent social activity (which might cause or reinforce an individual’s sense of being alone), less healthy diet, and higher stress in life. While generally in line with prior research connecting loneliness and poor health outcomes (Ong, Uchino, & Wethington, 2016), other studies have also associated loneliness with reduced physical activity (Hawkey & Cacioppo, 2010; Ong, Uchino, & Wethington, 2016). Study results support continued attention to reducing loneliness for older adults. Consistent with previous studies, a greater sense of both **social cohesion** and **community belonging** were positively related to healthy behaviors and health outcomes, suggesting that evaluation of one’s social environment may be an important factor in health and wellness.

**Figure 2. Age Well Study Participants’ Social Activity**

When asked how often they engage in different forms of social activity with friends, respondents said that they meet in-person, talk on the phone, or write letters/emails with relatively equal frequency overall, but were far less active on social media.



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**Higher spirituality was linked to positive behaviors, better health, and lower stress.**

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As with past research, higher **spirituality** was linked to positive behaviors, better health, and lower stress. In contrast, **religiosity** (a more traditional conception of formal religious belief) was associated with fewer outcomes, with participants who are more religious, and with eating less healthy diets. This conflicts with prior research that has found an association between religiosity and many health benefits (VanderWeele, 2017), including healthy diets (Tan, Chan, & Reidpath, 2013). The reasons for this result are unclear; however, since both **religion** and diet often have a strong presence in cultural beliefs and customs, this may be explained by some additional cultural factor not captured in the current analysis. Geographic region was considered as a possible factor, since it may be associated with both degree of religiosity and diet. However, additional investigation suggested that regional differences do not explain the observed relationship between **religiosity** and diet.

# ORGANIZATIONAL FACTORS

Organizational factors and features of Life Plan Communities may affect residents’ health. Age Well Study findings related to organizational factors are displayed in Tables 10 and 11. Table 10 shows the relationship between organizational factors and healthy behaviors, while Table 11 shows the relationship between organizational factors and health outcomes.

**Table 10. Relationship between Organizational Factors and Healthy Behaviors**

	Physical Activity (overall)	Social Activity (overall)	Healthy Diet	Meditation/ Personal Contemplation
Profit status				
Number of sites				
Fee structure				
Religious affiliation				↑
Non-religious affiliation				↓
Area type (suburban, rural, urban)				
Number of IL residents				
Number of Amenities	↑			
Region		S > MW		S/MW > W

■ Positive Outcomes  
■ Negative Outcomes



Residents of communities with more amenities are more physically active.

**Table 11. Relationship between Organizational Factors and Health Outcomes**

	Self-Reported Health	Stress
Profit status		
Number of sites		
Fee structure		
Religious affiliation		
Area type (suburban, rural, urban)		
Smaller (Number of IL residents)		↑
Larger (Number of IL residents)		↓
Number of Amenities		
Region		

■ Positive Outcomes  
■ Negative Outcomes

Note: Direction of arrows indicates an increase (↑) or decrease (↓) in the behavior or health outcome in relation to the predictors in the left column. Since behaviors and health outcomes may be positive (e.g., healthy diet) or negative (e.g., stress), colors highlight positive (teal) or negative (orange) outcomes. For Region, MW = Midwest, S = South, W = West; Northeast (NE) is not included in these results as there were no differences between NE and other regions for these outcomes.

- **RELIGIOUS AFFILIATION:** Residents of communities with a religious affiliation spend more time on meditation or personal contemplation (which may include prayer).
- **COMMUNITY SIZE (BY NUMBER OF INDEPENDENT LIVING RESIDENTS):** Residents of smaller communities report more stress in their lives.
- **NUMBER OF AMENITIES:** Residents of communities with more amenities are more physically active.
- **REGION:** Residents of communities in the South region are more socially active than those in the Midwest. Residents in the South and Midwest regions spend more time on meditation and personal contemplation than those in the West.
- There were no relationships observed between healthy behaviors and health outcomes for the organizational factors of profit status, number of sites (single or multiple), fee structure, and area type (urban, suburban, rural).



Similar to the results in the Year 1 report of the Age Well Study, there are very few associations between organizational characteristics of Life Plan Communities and residents' healthy behaviors and outcomes. It may be that these high-level environmental factors do not directly impact residents' health, and that more personal factors may play a more critical role. However, some relationships were observed. Residents in communities with a **greater number of amenities** were more physically active, possibly due to the availability of features supporting physical wellness. This aligns with previous research that has found a relationship between increased physical activity and amenities such as walking paths (Joseph & Zimring, 2007; Nathan, Wood, & Giles-Corti, 2014) and exercise facilities (Kerr et al., 2011). It may also be that more physically active people are drawn to communities with more physical amenities.

There was also a difference in time spent on meditation or personal contemplation by residents in **religiously affiliated vs. non-affiliated communities**, with residents in the former engaging in this behavior more. Due to how the question was worded, religious participants might have included prayer in this category of behavior, explaining their increased frequency of engagement.

**Regional** effects suggested some differences between participants living in the South versus other regions, namely their increased social activity and more frequent time spent on meditation or personal contemplation.

## DEMOGRAPHICS & OTHER PERSONAL FACTORS

Results detailed in previous sections account for the possible influence of several demographic and other personal factors that might impact engagement in healthy behaviors or other health outcomes. These additional factors are examined here.

**Table 12. Relationship between Demographic Factors and Healthy Behaviors**

	Physical Activity (overall)	Social Activity (overall)	Healthy Diet	Meditation/ Personal Contemplation
Older age	↓	↓	↑	↓
Female	↓	↑		↑
Male	↑	↓		↓
Higher income	↑	↑	↑	↓
Higher education	↑	↑	↑	
Married/Partnered		↓	↑	
Not Married/Partnered		↑	↓	
More depressive symptoms	↓	↓	↓	
More chronic conditions	↓		↓	
Longer length of residence				↑

■ Positive Outcomes  
■ Negative Outcomes

Residents who are not in a relationship are more socially active.

**Table 13. Relationship between Demographic Factors and Health Outcomes**

	Self-Reported Health	Stress
Older age	↓	↑
Female		
Male		
Higher income	↑	↓
Higher education		
Married/Partnered		↑
Not Married/Partnered		↓
More depressive symptoms	↓	↑
More chronic conditions	↓	↑
Longer length of residence		

■ Positive Outcomes  
■ Negative Outcomes

Note: Direction of arrows indicates an increase (↑) or decrease (↓) in the behavior or health outcome in relation to the predictors in the left column. Since behaviors and health outcomes may be positive (e.g., healthy diet) or negative (e.g., stress), colors highlight positive (teal) or negative (orange) outcomes.

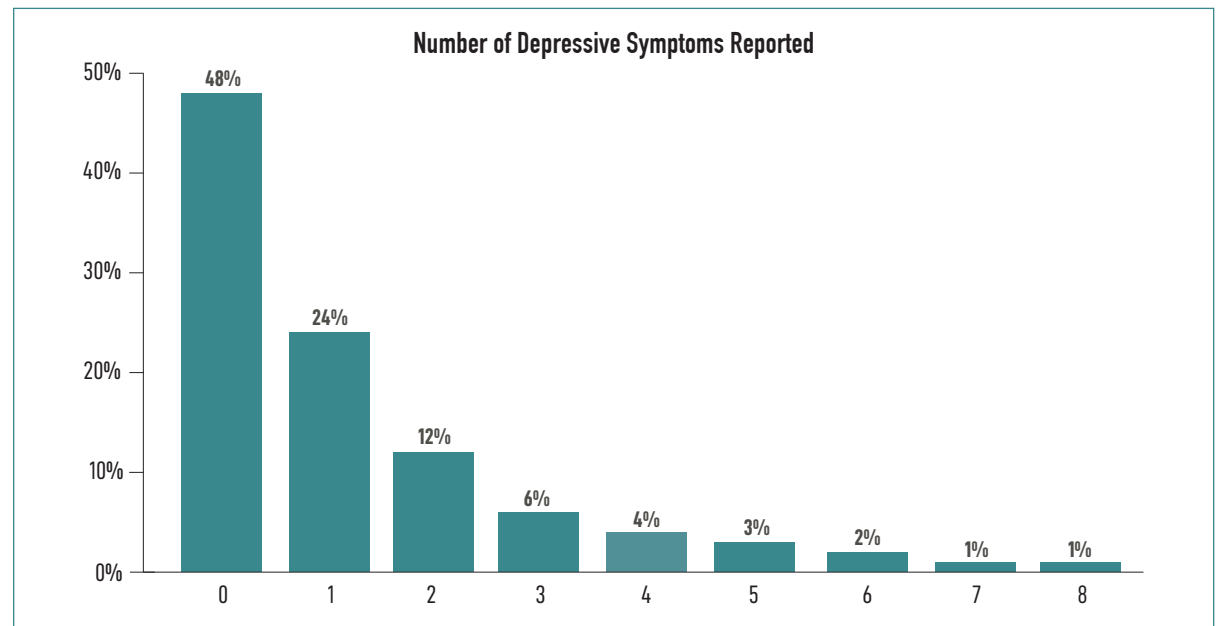
- **AGE:** Older residents eat healthier diets. However, they are also less physically and socially active, spend less time on meditation and personal contemplation, and report worse health and more stress in their lives.
- **GENDER:** Male residents are more physically active (except for mild physical activity, which females engage in more frequently). Female residents are more socially active and spend more time on meditation or personal contemplation.
- **INCOME:** Residents with higher total household incomes are more physically and socially active, eat healthier diets, and report better overall health and less overall stress in their lives. However, they spend less time on meditation or personal contemplation.
- **EDUCATION:** Residents with higher levels of education are more physically and socially active and eat healthier diets.
- **MARITAL STATUS:** Residents who are in married/partnered couples eat healthier diets; however, they also report more stress in their lives compared to residents not in relationships. Residents who are not in a relationship are more socially active.



- **DEPRESSIVE SYMPTOMS:** Residents reporting more depressive symptoms (see Figure 3), such as restless sleep, are less physically and socially active and eat less healthy diets. They also report worse overall health and more stress in their lives.
- **CHRONIC HEALTH CONDITIONS:** Similar to those reporting more depressive symptoms, residents reporting more chronic health conditions are less physically active and eat less healthy diets. They also report worse overall health and more stress in their lives.
- **LENGTH OF RESIDENCE:** Residents living in their communities longer spend more time on meditation or personal contemplation.

**Figure 3. Number of Depressive Symptoms Reported by Age Well Study Participants**

Almost half of participants (48%) reported experiencing zero symptoms of depression. The most commonly reported symptom was “My sleep was restless,” reported by 30% of participants.





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**Older participants report eating healthier diets.**

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Older age was generally associated with fewer healthy behaviors, worse self-reported health, and more stress. However, older participants report eating healthier diets, possibly due to the perceived benefits for their health as they age. **Gender** differences suggested that **male** participants are more physically active, but that **female** participants are more socially active. **Gender** differences in activity preferences might affect couples in unique ways, if one member tends to decide in which activities the couple will engage, or if couples differ in whether they engage in activities together or individually with other company. There were also differences in **marital status**—residents in relationships eat healthier diets, perhaps due to partners encouraging one another to eat better more consistently. Participants in married or partnered relationships are less socially active (with friends) compared to participants not in such relationships, possibly because the latter seek the company of friends to enrich their social lives, while members of couples attain at least some social fulfillment with their partner. Since a large proportion of non-coupled residents are widowed, they may also seek the company of friends to alleviate feelings of loneliness or isolation.

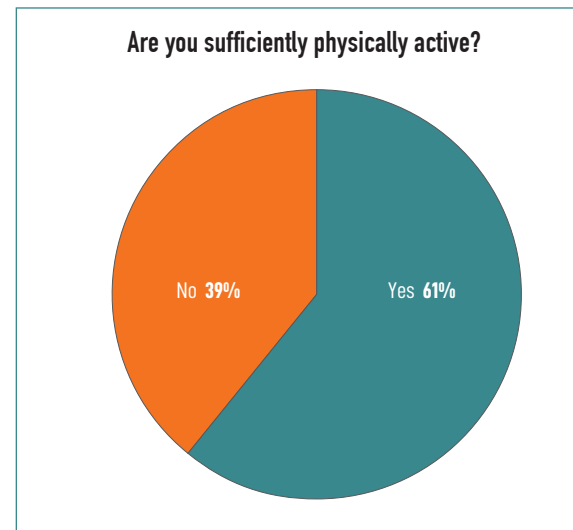
Higher levels of **household income** and **education** were generally associated with increased healthy behaviors, which may be due to increased knowledge of health and wellness or increased availability of healthier food or more opportunities for activity engagement. Increased reports of **depressive symptoms** and **chronic health conditions** were associated with fewer healthy behaviors, worse health, and higher stress in life, reinforcing the importance of designing programs and living environments to promote well-being for individuals with these conditions that might require special care.

## BARRIERS TO PHYSICAL ACTIVITY

The benefits of physical activity are compelling. Physical activity is linked to longevity, reduced risk of many health conditions, and benefits to balance, functional ability, and cognitive ability (Nelson et al., 2007). However, most older adults don't get enough physical activity (Macera et al., 2003). A better understanding of why individuals are not active can be used to tailor environments and programs to meet resident needs.

Age Well Study findings related to physical activity are discussed below. Figure 4 displays perceptions of physical activity among residents. Figure 5 depicts barriers to physical activity among residents who said they were not sufficiently physically active. In Figure 6, the physical activity intensity level for participants is presented.

**Figure 4. Age Well Study Participants' Perceptions of Their Physical Activity**



When asked “From your point of view, are you sufficiently physically active?”, about 61% of respondents said Yes (see Figure 4). Of the approximately 39% that answered No (see Figure 5):

- **47%** said that they weren’t more active because of health reasons.
- **44%** said that they weren’t interested in physical activity.
- **36%** said that they were afraid of falling or hurting themselves during exercise.
- **30%** said that they didn’t have any company and would be more active with a partner/group.
- **27%** said that they didn’t have time for physical activity.
- **24%** said that there weren’t any appropriate sports programs for them.
- **9%** said that none of the above barriers applied to them, suggesting that their physical activity may be inhibited for other reasons.

**Figure 5. Barriers to Physical Activity by Age Well Study Participants Who Felt That They Were Not Sufficiently Physically Active**

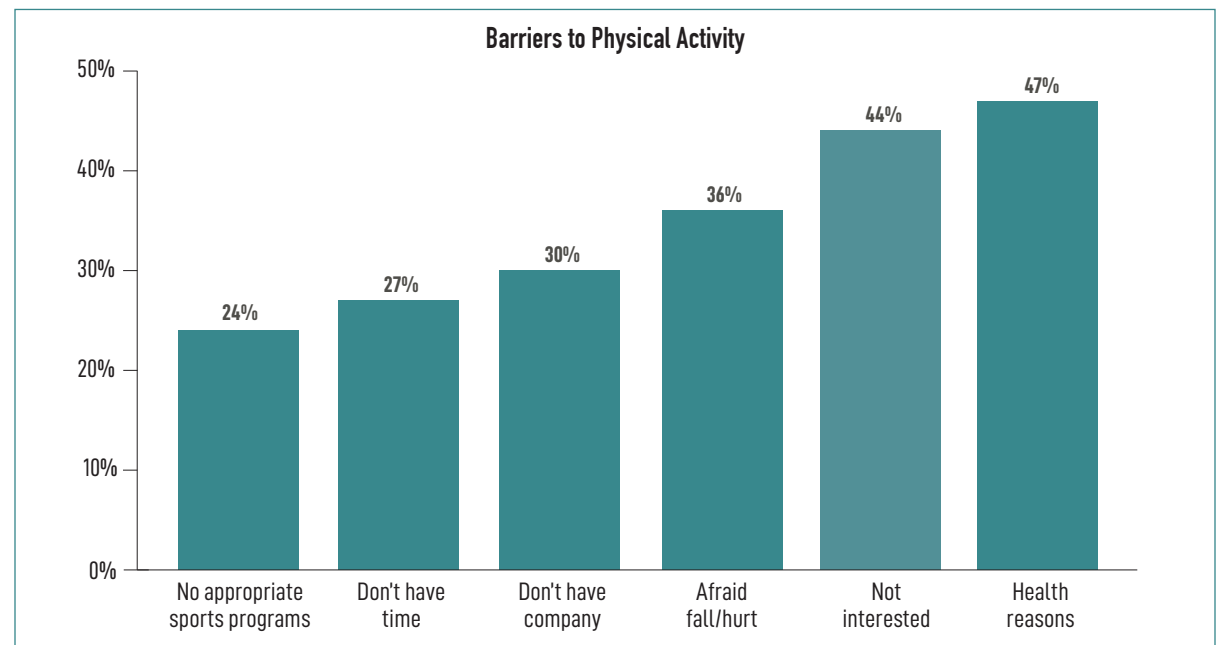
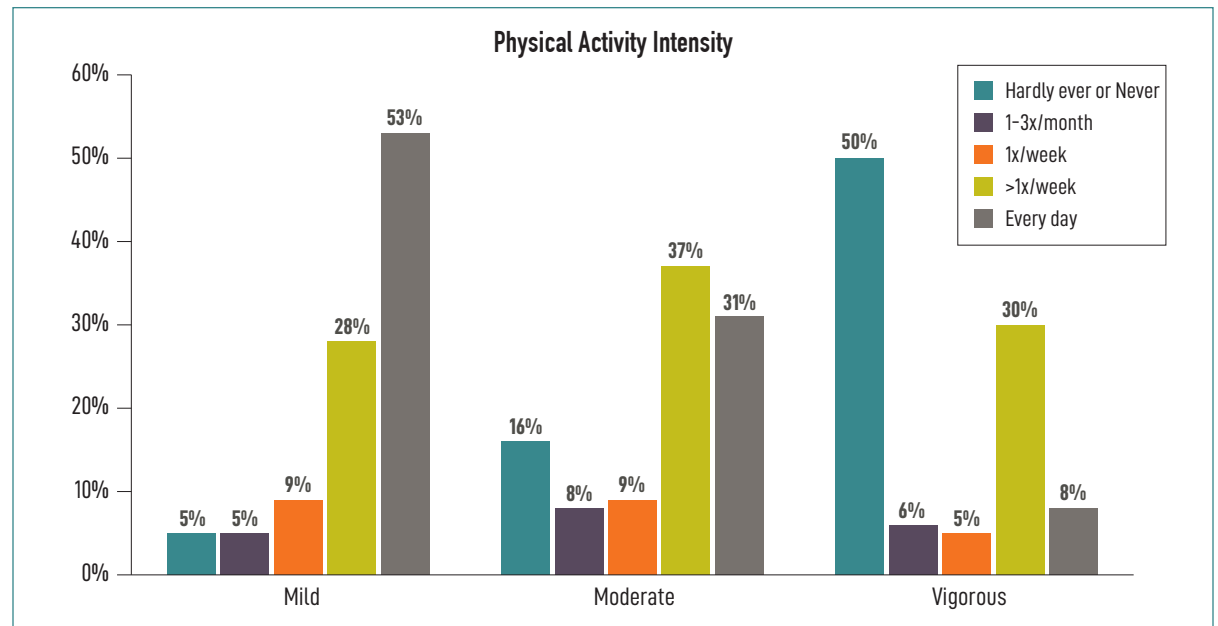






Figure 6 illustrates overall physical activity of different intensity levels (mild, moderate, and vigorous) reported by Age Well participants. Mildly energetic activities were described as vacuuming, laundry, or walking at a slow pace. Moderately energetic activities were described as gardening, cleaning the car, walking at a moderate pace, dancing, and floor or stretching exercises. Vigorous activities were described as running or jogging, swimming, cycling, aerobics or gym workout, tennis, or digging with a spade or shovel. Analyses showed that physical activity was lower for residents who reported any of the barriers listed, except for lack of time. Perhaps surprisingly, residents reporting lack of time as a barrier to physical activity were actually more active overall than those who did not perceive time as a barrier. Among all other barriers, lack of interest, health reasons, and fear of falling or getting hurt were most strongly associated with reduced physical activity; these three were also the most commonly reported barriers by residents.

**Figure 6. Intensity Levels of Physical Activity Reported by Age Well Study Participants**



## DIFFERENCES IN BARRIERS BY AGE, GENDER, OR OTHER FACTORS

- **LACK OF APPROPRIATE SPORTS PROGRAMS**

- ↑ More likely to be reported as a barrier by male residents, lonelier residents, and those reporting more chronic health conditions
- ↓ Less likely to be reported as a barrier by more extroverted residents and those with a greater sense of purpose in life

- **LACK OF TIME FOR PHYSICAL ACTIVITY**

- ↑ More likely to be reported as a barrier by female residents, lonelier residents, those with a greater sense of purpose in life, and those with a stronger sense of social cohesion in their communities
- ↓ Less likely to be reported as a barrier by residents with more depressive symptoms, and residents not in married/partnered relationships

- **LACK OF COMPANY (PARTNER OR GROUP) FOR EXERCISE**

- ↑ More likely to be reported as a barrier by male residents, and those not in married/partnered relationships
- ↓ Less likely to be reported as a barrier by more conscientious residents

- **FEAR OF FALLING OR GETTING HURT DURING EXERCISE**

- ↑ More likely to be reported as a barrier by female residents, older residents, those with more chronic health conditions, more neurotic residents, and residents with higher religiosity
- ↓ Less likely to be reported as a barrier by more extroverted residents, more resilient residents, more spiritual residents, those with more positive perceptions of aging, and those with a stronger sense of social cohesion within their communities

- **LACK OF INTEREST IN PHYSICAL ACTIVITY**

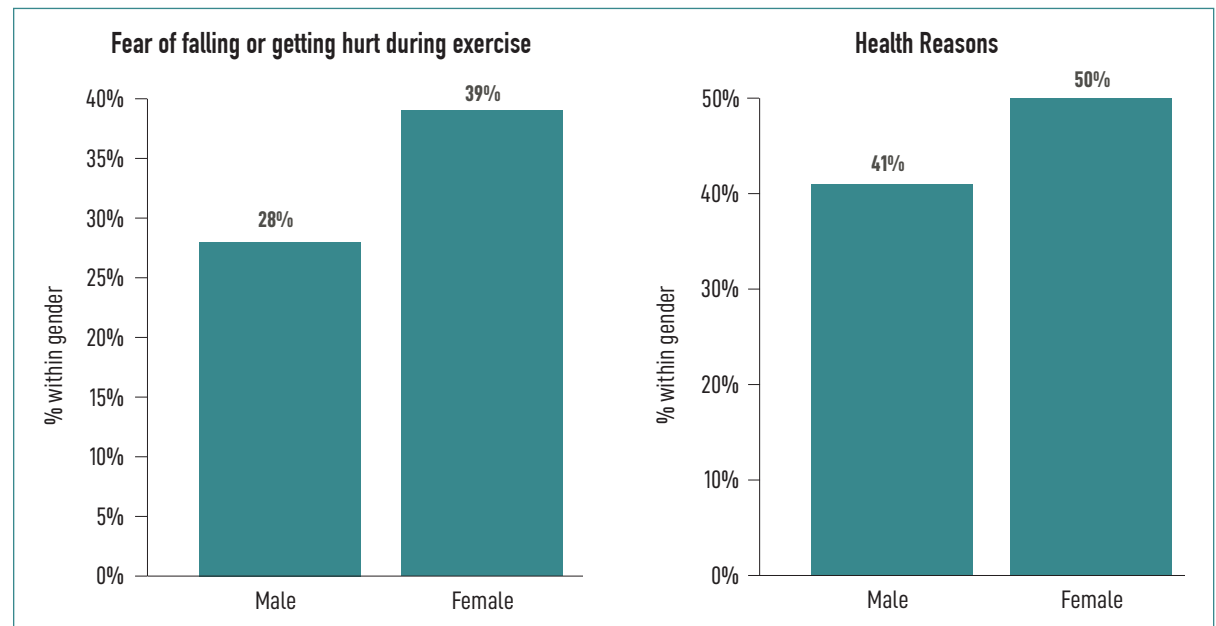
- ↑ More likely to be reported as a barrier by residents with a higher sense of perceived control over their lives
- ↓ Less likely to be reported as a barrier by more extroverted residents, more spiritual residents, those with a greater sense of purpose in life, more spiritual residents, and those with a greater sense of social cohesion within their communities

- **HEALTH REASONS LIMIT/PREVENT PHYSICAL ACTIVITY**

- ↑ More likely to be reported as a barrier by female residents, more conscientious residents, older residents, those with more depressive symptoms, more chronic health conditions, and those living in their communities longer
- ↓ Less likely to be reported as a barrier by more extroverted residents, and those with more positive perceptions of aging

The largest gender differences in reported barriers to physical activity were in **fear of falling or getting hurt during exercise** and **health reasons** (see Figure 7). Among residents who reported not being sufficiently active, females were more likely than males to report both of these reasons as barriers. These findings are consistent with prior studies (Bruce, Devine, & Prince, 2002; Moschny et al., 2011; Newson & Kemp, 2007).

**Figure 7. Gender Differences in Fear of Falling or Getting Hurt and Health Reasons as Barriers to Physical Activity**



Note that these graphs include only those participants who answered “No” to believing that they were sufficiently physically active.



## DISCUSSION



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**Residents who form strong bonds within their community tend to engage in more healthy behaviors and have better overall health.**

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Findings from Year 1 of the Age Well Study revealed that Life Plan Community residents, on average, have relatively high levels of health and wellness compared to older adults in the community at large. However, there are individual differences in health and wellness across residents. Year 2 of the Age Well Study identifies specific resident characteristics associated with healthy behaviors and overall health of residents. **By identifying key factors related to resident wellness, the study findings can be used to inform the development and customization of programs and resources to support resident wellness.**

Overall, residents with higher levels of extroversion reported more healthy behaviors and better health overall, while the findings related to the other personality characteristics were more mixed. Personality characteristics, such as extroversion and conscientiousness, tend to be relatively stable throughout one's lifespan. Therefore, it is important for Life Plan Communities to provide a variety of wellness offerings that may appeal to residents with different personalities. **For example, boisterous group exercise classes may be well-suited for extroverts, whereas introverts may prefer one-on-one fitness coaching or exercise in their private residences.**

Residents who reported higher levels of psychological/personal resources, such as optimism and positive perceptions of aging, tended to report more positive outcomes; however, the pattern of results varied across types of healthy behaviors and health outcomes. Previous research suggests that some psychological resources, such as optimism and resilience, can be learned and strengthened. Programs to increase residents' psychological resources may also contribute to residents' engagement in healthy behaviors and overall health. For instance, older adults with negative perceptions of aging may believe that it's natural for older adults to be sedentary. **Pairing an educational program aimed at changing residents' expectations regarding aging with an exercise class may work to improve residents' physical activity levels (e.g., Sarkisian, Prohaska, Davis, & Weiner, 2007).**

The study findings further suggest that **residents who form strong bonds within their community tend to engage in more healthy behaviors and have better overall health.** Similarly, spirituality, which is a sense of connection with something greater than one's self, was associated with several measures of healthy behaviors and overall health in this study. Formal and informal opportunities for social engagement tend to be plentiful within Life Plan Communities; however, residents may differ in their level of participation as well as their feelings of belonging and connection.

## PROPOSED STRATEGIES FOR ORGANIZATIONS

Life Plan Communities interested in leveraging the study findings to support the health and well-being of residents should consider the following broad strategies for developing or customizing programs and resources:

- In addition to group exercise classes, provide physical fitness offerings that appeal to introverts, such as private fitness coaching and expanded fitness center hours.
- Offer lectures or other programs that provide education on psychological/personal resources (e.g., resilience, sense of purpose, optimism) and ideas on how to foster them.
- Break down barriers to fitness by combining an exercise class with an educational segment on safety for older adults who exercise.
- Strengthen bonds among residents through programs such as “welcome buddy” pairing for new residents, programs that place different residents together at meals, and engaging more residents in programs and activities.
- Provide programs and environments that target change in depressive symptoms in order to improve mood, motivation, or energy.
- Offer a wellness coaching program to residents that enables them to identify opportunities for enhancing wellness that are tailored to their individual needs, interests, and preferences.

Furthermore, residents may prefer to fulfill their social and spiritual needs in different ways, so communities may want to offer a spectrum of programs, opportunities, and resources to address diverse interests.

It is interesting to note that few organizational characteristics measured in this study were associated with residents’ healthy behaviors and overall health. Individual characteristics of the residents were a stronger indicator of their wellness. Although not measured directly in this study, residents may participate in different types of programs and services, offered within and outside of their Life Plan Community, that could impact their health and well-being.

Study findings also revealed that six out of 10 residents indicated that they are sufficiently physically active. Among residents who are not sufficiently active, the most commonly mentioned barrier to physical activity is that they are inactive for health reasons. This suggests that **there may be an opportunity to educate residents about aging and physical activity**. Some residents may have a general misconception that it is not safe for older adults to exercise or they may not know how to safely modify physical activities to accommodate any physical limitations.

## CAVEATS

Although the study demonstrated associations between various psychological, individual, social, and, to a much lesser extent, organizational factors and healthy behaviors and outcomes, it should be noted that these relationships may not be causal in nature. For example, the study indicates that higher optimism is associated with greater social activity among residents of Life Plan Communities. It may be that higher optimism causes social activity, social activity causes higher optimism, or something else that was not measured by this study causes both higher optimism and greater social activity.

A second caveat is that, as in Year 1, organizations and participants self-selected into the study, and their responses may not be representative of all Life Plan Communities. For example, participating residents may be more inclined to participate in wellness activities than those who did not participate.

Participating communities may also be more likely to prioritize wellness and offer greater wellness resources.

In addition, the survey may not have captured the entirety of participants' experience with these factors and outcomes. For example, when residents are asked about social cohesion and community belonging, they are asked to think about their experience within the Life Plan Community, however, they may have strong pre-existing friendships and social networks outside of the Life Plan Community that affect their overall level of social activity.

Finally, as in Year 1, all data included in the analysis relied on self-report measures rather than objective assessments. For example, residents were asked to report the frequency of physical activity rather than sending their physical activity data via a tracking device. Because of potential error in memory or tendency to inflate scores for positive behaviors and characteristics, data may contain inaccuracies that could affect the results of the analysis.

## FUTURE STUDY

In Year 1 of the study, findings revealed that residents of Life Plan Communities score more favorably than older adults in the community at large in five of six dimensions of wellness. Study findings from Year 2 build on our understanding of wellness among Life Plan Community residents by identifying a diverse set of factors associated with healthy behaviors and health outcomes. Additional data will be collected annually for the next three years of the study. In future years, change in wellness outcomes over time among residents will be compared to change over time among older adults in the community at large.

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# APPENDIX A – STUDY MEASURES

## HEALTHY BEHAVIORS AND OUTCOMES

**PHYSICAL ACTIVITY:** Participants were asked three questions assessing how often they engage in vigorous, moderate, or mildly energetic activities (1 = Hardly ever or never, 2 = One to three times a month, 3 = Once a week, 4 = More than once a week, 5 = Every day). Scores on the three items were averaged together for an overall physical activity score, ranging from 1 to 5. [Included from HRS]

**SOCIAL ACTIVITY:** Measures how often individuals contact others in their social networks through various means of communication. Participants rated how frequently they contact their friends using four modes of communication: in-person meetings, phone calls, written/email messages, and Skype/Facebook/other social media (1 = Less than once a year or never, 2 = Once or twice a year, 3 = Every few months, 4 = Once or twice a month, 5 = Once or twice a week, 6 = Three or more times a week). Scores on the four items were averaged together for a composite score that could range from 1 to 6. [Included from HRS]

**HEALTH OF OVERALL DIET:** Participants were asked to rate how healthy their diet is overall using a single-item measure (1 = Poor, 5 = Excellent).

**MEDITATION/PERSONAL CONTEMPLATION:** Administered as a single item, participants were asked “How often do you meditate or take time for personal contemplation?” (1 = Never, 2 = Less than once a month, 3 = Once a month, 4 = A few times a month, 5 = Once a week, 6 = A few times a week, 7 = Once a day, 8 = More than once a day). [Included from HRS]

**SELF-REPORTED HEALTH:** Participants rated their own health status using a single-item measure (1 = Poor, 2 = Fair, 3 = Good, 4 = Very good, 5 = Excellent). [Included from HRS]

**STRESS:** Measures participants’ appraisal of stress in their daily lives (Perceived Stress Scale; Cohen, Kamarck, & Mermelstein, 1983). Participant rated four statements that assessed how often they felt stressed or that their problems were out of their control (1 = Never, 2 = Almost never,

3 = Sometimes, 4 = Fairly often, 5 = Very often). The ratings were averaged together for a composite score that ranged from 1 to 5.

## PERSONALITY

**PERSONALITY:** Measures the “Big 5” dimensions of personality (Lachman & Weaver, 1997; IPIP, <http://ipip.ori.org/>). Participants rated the extent to which 31 personality traits describe themselves (1 = Not at all, 4 = A lot). Four to ten items were averaged together for each dimension of personality to produce composite scores (ranging from 1 to 4) for neuroticism, extroversion, openness to experience, agreeableness, and conscientiousness. [Included from HRS]

## PSYCHOLOGICAL/PERSONAL RESOURCES

**OPTIMISM:** Measures the extent to which people expect positive outcomes in the future (Scheier, Carver, & Bridges, 1994). Participants rated their level of agreement with six items (1 = Strongly disagree, 6 = Strongly agree). A composite score for optimism was calculated by averaging the three items associated with each scale. Composite scores could range from 1 to 6. [Included from HRS]

**PERCEIVED CONTROL:** Measures participants’ sense of control or agency over their own lives and activities (Lachman & Weaver, 1998; Pearlin & Schooler, 1978). Participants rated the extent to which they agreed or disagreed with five statements regarding their confidence in controlling their own lives (1 = Strongly disagree, 6 = Strongly agree). Responses to the five items were averaged together for a composite score that could range from 1 to 6. [Included from HRS]

**SENSE OF PURPOSE IN LIFE:** Measures an individual’s feelings of worth and accomplishment in life (Ryff, 1989; 1995). Participants rated their agreement with seven statements regarding their feelings of purpose and sense of direction in life (1 = Strongly disagree, 6 = Strongly agree). Responses to each item were averaged together for a composite score that could range from 1 to 6. [Included from HRS]

**PERCEPTIONS OF AGING:** Measures attitudes toward aging (Kotter-Grühn, Kleinspehn-Ammerlahn, Gerstorf, & Smith, 2009; Lawton, 1975; Liang & Bollen, 1983). Participants rated the extent to which they agreed or disagreed with eight statements (1 = Strongly disagree, 6 = Strongly agree). Items were averaged together for a composite score that could range from 1 to 6. [Included from HRS]

**RESILIENCE:** Measures an individual’s ability to “bounce back” or recover from stressful events. It was assessed using the six-item Brief Resilience Scale (Smith et al., 2008). Participants rated the extent to which they agreed or disagreed with each statement (1 = Strongly disagree, 7 = Strongly agree), and items were averaged together for a composite score that could range from 1 to 7.

## **SOCIAL AND SPIRITUAL**

**LONELINESS:** Measures feelings of isolation and lack of social contact/connections (Hughes, Waite, Hawkey, & Cacioppo, 2004). Administered as a 11-item scale that asks participants how often they feel lonely or isolated from others (1 = Often, 2 = Some of the time, 3 = Hardly ever or never). Item responses were averaged together for a composite score that could range from 1 to 3. [Included from HRS]

**SOCIAL COHESION:** Adapted from a measure of neighborhood cohesion, measures an individual’s perceptions of cohesion and closeness with others living in their senior living community, focusing more on social relationships than on being part of the community overall (Buckner, 1988; Fone et al., 2007; Robinson & Wilkinson, 1995). Administered as an eight-item scale that asks participants to rate the extent to which they agree/disagree with statements about their relationships with others within the senior living community (1 = Strongly disagree, 6 = Strongly agree). Responses to each item were averaged together for a composite score that could range from 1 to 6.

**COMMUNITY BELONGING:** Adapted from a measure of neighborhood belonging, measures participants’ sense of belonging as a member of their senior living community (Buckner, 1988; Fone, Dunstan, Lloyd, Williams, Watkins, & Palmer, 2007; Robinson & Wilkinson, 1995). Participants rated the extent to which they agreed with six statements about their feelings toward the senior living community (1 = Strongly disagree, 6 = Strongly agree). Responses were averaged together for a composite score that could range from 1 to 6.

**RELIGIOSITY:** Measures religious beliefs and values separate from religious affiliation (Levin, 2003). Participants rated the extent to which they agree/disagree with four statements regarding their religious beliefs (1 = Strongly disagree, 6 = Strongly agree). Responses to the items were averaged together for a composite score that could range from 1 to 6. [Included from HRS]

**SPIRITUALITY:** Administered as a single item, participants were asked “To what extent do you consider yourself a spiritual person?” (1 = Not spiritual at all, 2 = Slightly spiritual, 3 = Moderately spiritual, to 4 = Very spiritual). [Included from HRS]

## **OTHER (DEMOGRAPHICS & PERSONAL FACTORS)**

**DEPRESSION:** A measure of depressive symptoms experienced by older adults (Lewinsohn, Seeley, Roberts, & Allen, 1997). Participants completed an eight-item version of the Center for Epidemiological Studies-Depression scale (CES-D; Radloff, 1977). Participants indicated (Yes/No) if they experienced each depressive symptom “much of the time” during the past week. The number of depressive symptoms experienced were added together, and composite scores could range from 0 to 8. [Included from HRS]

**CHRONIC HEALTH CONDITIONS:** Participants indicated (Yes/No) if a doctor has ever informed them that they have one of the chronic health conditions listed (high blood pressure; diabetes or high blood sugar; heart attack, coronary heart disease, angina, congestive heart failure, or other health problems; stroke; emotional, nervous, or other psychiatric problems; arthritis or rheumatism; memory problems). An overall score was calculated by adding together the number of chronic conditions for each participant, and scores could range from 0 to 7. [Included from HRS]

## **BARRIERS TO PHYSICAL ACTIVITY**

**BARRIERS TO PHYSICAL ACTIVITY:** Measures the extent to which older adults perceive barriers to being physically active (Moschny, Platen, Klaaßen-Mielke, Trampisch, & Hinrichs, 2011). Participants were asked, “From your point of view, are you sufficiently physically active?” (Yes/No). Participants who responded “No” were asked if they agree (3), partly agree (2), or disagree (1) that each of 6 barriers applies to them.

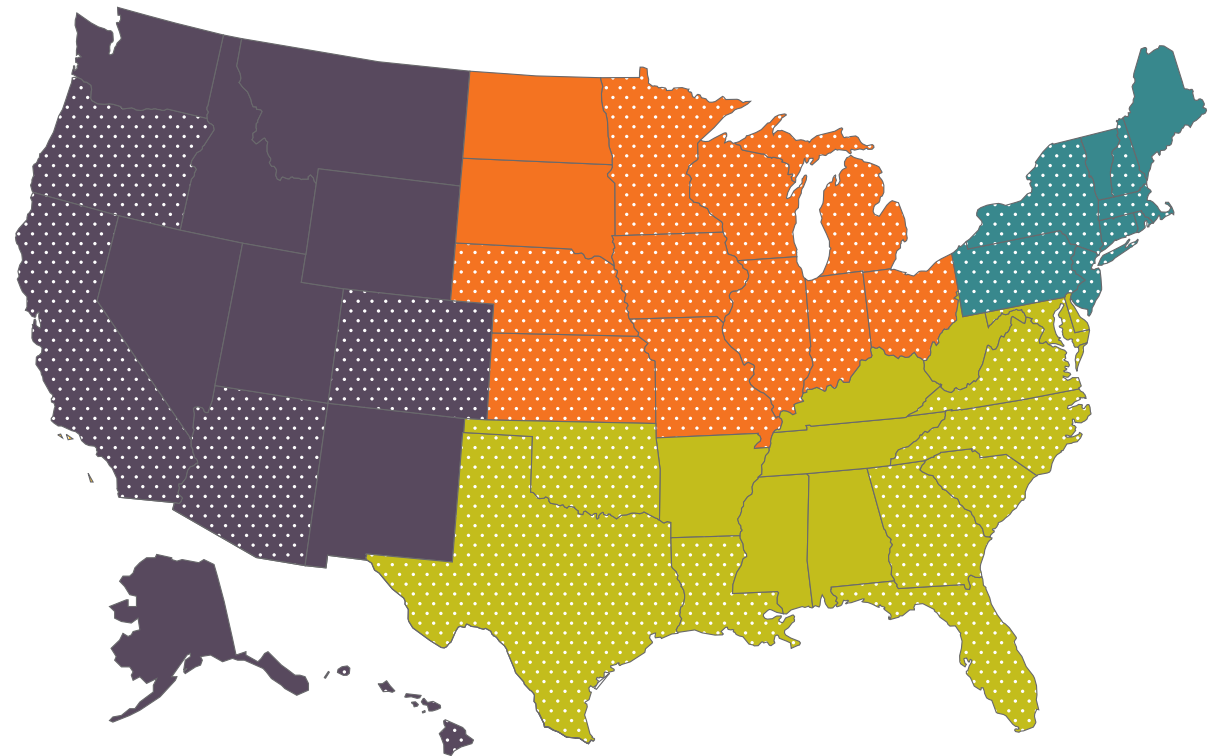


**Table 14. Descriptive Statistics for Select Measures**

	Participant Mean (Average)	Participant Range
Stress	1.81	1 - 5
<b>Personality</b>		
Openness to Experience	3.09	1 - 4
Conscientiousness	3.34	1 - 4
Extroversion	3.26	1 - 4
Agreeableness	3.48	1 - 4
Neuroticism	1.95	1 - 4
<b>Personal/Psychological Resources</b>		
Optimism	4.94	1 - 6
Perceived Control	4.77	1 - 6
Purpose	4.78	1 - 6
Perceptions of Aging	3.77	1 - 6
Resilience	5.19	1 - 7
<b>Social/Communal</b>		
Loneliness	1.39	1 - 3
Social Cohesion	3.94	1 - 5
Community Belonging	4.49	1 - 5
Religiosity	4.29	1 - 6
Spirituality	2.74	1 - 4
<b>Other</b>		
Age	83.82	57 - 106
Chronic Conditions	1.84	0 - 7
Length of Residence (months)	71.18	0 - 435

## APPENDIX B – MAP OF GEOGRAPHIC REGIONS

Organizations and residents were categorized based on the US geographic region in which they are located. Regions are based on HRS definitions. The figure below displays the states included in Northeast, Midwest, South, and West regions. Life Plan Communities that are participating in the Age Well Study are located in the states marked with dots.



- Northeast
- Midwest
- South
- West

Dots indicate states where participating Life Plan Communities are located.

## ABOUT THE ADVISORY GROUP

**MATHER** (Evanston, IL) is a respected resource for research and information about wellness, aging, trends in senior living, and aging services innovations. In order to support senior living communities and others that serve older adults, the Institute shares its cutting-edge research in areas including effective approaches to brain health, ways to enhance resilience, and employee wellness programs. Mather Institute is part of Mather, a nearly 80-year-old not-for-profit organization dedicated to developing and implementing Ways to Age Well<sup>SM</sup> by creating programs, places, and residences for today's young-at-heart older adults. In 2018, Mather impacted more than 180,000 older adults and industry professionals, directly and indirectly.

**AMERICAN SENIORS HOUSING ASSOCIATION** (Washington, DC) provides leadership for the seniors housing industry on legislative and regulatory matters, advances research, education and the exchange of strategic business information, and promotes the merits of seniors housing. While most members are for-profit operators or financiers, ASHA's membership also includes a significant number of executives from leading not-for-profit seniors housing providers and other prominent professionals. The Association's membership owns and/or manages an estimated 600,000 units of seniors housing in the US. The ASHA membership is comprised of companies with small market and regional presence, as well as most national providers.

**LEADINGAGE** (Washington, DC) is a national association of 6,000 not-for-profit organizations representing the entire field of aging services, 39 state partners, and hundreds of businesses, consumer groups, foundations, and research partners. Together, its members touch 4 million lives every day. The mission of LeadingAge is to expand the world of possibilities for aging. LeadingAge is also a part of the International Association of Homes and Services for the Aging (IAHSA), which spans 30 countries across the globe. LeadingAge is a 501(c)(3) tax exempt charitable organization focused on education, advocacy, and applied research.

**LIFE CARE SERVICES** (Des Moines, IA) is the third largest manager of rental senior living communities and Life Plan Communities. Every community offers a rich array of services, countless programs for a fulfilling lifestyle, wellness programming for healthful living, social opportunities and resident camaraderie, plus a community-customized continuum of care for peace of mind. Communities managed by Life Care Services may include residences for independent living, assisted living, memory care, skilled nursing care, or a combination of these living arrangements.

**NATIONAL INVESTMENT CENTER** (Washington, DC) is a 501(c)(3) organization whose mission is to advance access and choice in seniors housing and care—from independent living (IL), assisted living (AL), and memory care, to skilled nursing and post-acute care. NIC provides research, education, and increased transparency that facilitate informed investment decisions, quality outcomes and leadership development in seniors housing and care.

**NORTHWESTERN UNIVERSITY** (Evanston, IL) is a leading university committed to excellent teaching, innovative research, and the personal and intellectual growth of its students in a diverse academic community. It is a premier research university that is home to more than 90 school-based centers and more than 50 University research centers.

**NOVARE**<sup>®</sup> is a national consortium of single-site and small-system Life Plan Community providers, whose mission is to accelerate member potential through peer-inspiring, collaborative leadership.

**ZIEGLER** (Chicago, IL) is a privately held investment bank, capital markets, wealth management, and proprietary investments firm. Specializing in the health care, senior living, education and religion sectors, as well as general municipal and structured finance, enables the firm to generate a positive impact on the communities it serves. Headquartered in Chicago with regional and branch offices throughout the US, Ziegler provides its clients with capital raising, strategic advisory services, equity and fixed income sales & trading, wealth management, and research.



Mather Institute is a respected resource for research and information about wellness, aging, trends in senior living, and successful aging service innovations. Whether conducting new research or interpreting the latest studies for professionals who serve older adults, the Institute is dedicated to supporting ways for older adults to Age Well.

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