

# Staten Island Falls Risk Survey, 2018 - Final Report

## OVERVIEW OF FALLS AMONG OLDER ADULTS

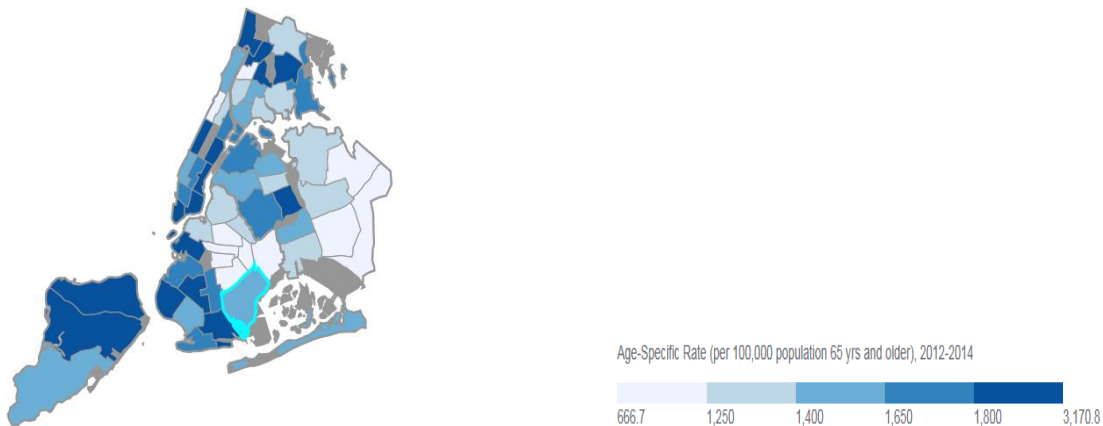
Falls are a major threat to the health and independence of older adults 65 years and older. Each year, approximately one in four older adults has a fall<sup>1</sup>, and less than half talk to their health care provider about it.<sup>2</sup> Falls can cause moderate to severe injuries, such as hip fractures and head traumas, and can increase the risk of early death.<sup>3</sup>

In New York City (NYC), falls rank as a leading contributor to morbidity and mortality among older adults.<sup>4</sup> Annually, there are almost 300 falls-related deaths among NYC's older adults. An additional 18,000 inpatient hospitalizations and nearly 33,000 emergency department visits occur as the direct result of falls.<sup>5</sup> As the NYC older adult population is expected to increase 45% from 2010-2030, an even heavier burden of falls and their attendant costs is projected.<sup>6</sup>

## PROBLEM STATEMENT, FALLS AMONG STATEN ISLANDERS

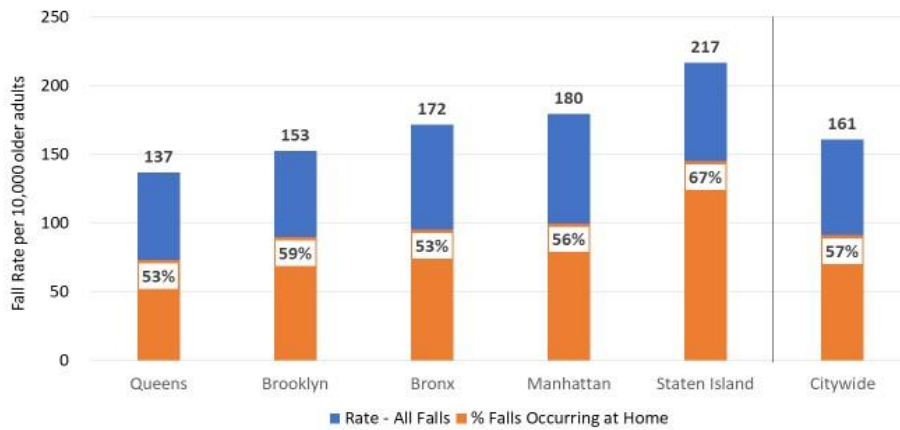
NYC's falls-related death rate among older adults is 27 deaths per 100,000 aged 65+ years, whereas Staten Island's death rate is 33.5 per 100,000 – the highest of NYC's five boroughs.<sup>7</sup> Staten Island is the only borough where the older adult falls hospitalization rate has increased since 2010. The falls hospitalization rate on Staten Island is also higher than the rate for NYC. A higher proportion of falls among older adults living on Staten Island are occurring in the home, when compared to the citywide proportion.<sup>8</sup>

### Fall-related hospitalizations among older adults - Age-Specific Rate (per 100,000 population 65 yrs and older), 2012-2014, by Community District



Source: New York State Statewide Planning and Research Cooperative System (SPARCS) inpatient data 2000-2011, updated March 2013; inpatient data 2012, updated April 2014. NYC DOHMH population estimates updated July 2013

**Fall-related hospitalization rates and proportion of falls at home among older adults by borough of residence, NYC, 2011-2014**



Source: Hospitalization data (Statewide Planning and Research Cooperative System) patient level hospital discharge information

**PATHWAY TO SOLUTIONS FOR OLDER ADULTS ON STATEN ISLAND**

Research shows multiple risk factors contribute to falls among older adults, including gait and balance impairments, muscle weakness, multiple medications, poor vision, hearing impairments and environmental hazards.<sup>9</sup> Environmental hazards for falls include many indoor risks, such as uneven or slippery floor surfaces, tripping obstacles, inadequate lighting, and unsafe stairways.<sup>10</sup> Absence of safety or preventive devices, such as nightlights, grab bars or handrails can also play a role in falls.<sup>11</sup> In addition, the psychological fear of falling may cause self-restricted movement and/or social isolation which may, in turn, place an older adult at risk for recurrent falls.<sup>12</sup> In communities where falls are occurring at higher rates, it is likely these risk factors feature prominently. Reducing falls requires reduction of these risks.

To understand the elevated falls-related hospitalization rates on Staten Island, as well as the borough’s high proportion of falls-related hospitalizations that result from a fall in the home, the NYC Department of Health and Mental Hygiene’s (DOHMH) Injury and Violence Prevention Program (IVPP) developed and implemented a falls risk survey for older adults living on Staten Island. The survey assessed comprehensively the home and social environments of older adults living on Staten Island, as well as their health status.

**SURVEY DESIGN AND STUDY PARTICIPANTS**

The Staten Island Falls Risk Survey was a cross-sectional, interviewer-led, semi-structured survey. Participants were recruited through a nested, snowball sampling approach. Institutions where seniors congregate – senior centers, health care settings and other senior-serving programs (e.g., meal delivery and home visitation services) – were sites and resources for survey participant recruitment. In addition, older adult participants referred eligible friends and neighbors to DOHMH project staff. We sought variation across geographic location of participant recruitment sites and homes on Staten Island; types of sites from which seniors were recruited; and participant gender, age, race/ethnicity, and health and social circumstances.

DOHMH's IVPP project staff administered the survey among community-dwelling seniors, aged 65 and older and English-speaking who lived on Staten Island, regardless of falls history. English is the most commonly spoken language among older adults on Staten Island.<sup>13</sup> Participants were excluded from the study if they were under 65 years of age, were non-ambulatory, and/or were cognitively impaired. Survey participants received a night-light, DOHMH's [Falls Safety Checklist](#), educational brochures, resources for seniors, and a gift card as incentives. Ineligible interviewees received the Checklist and educational brochure.

Recruitment started on June 12, 2018 and concluded on December 13, 2018. DOHMH project staff asked senior center staff, health care setting staff and other service sites to post signage and distribute promotional flyers indicating that a survey by NYC DOHMH was taking place. The flyer included a dedicated telephone number for potential participants to call and learn more about the survey and how to participate, if interested. The recruitment included 14 diverse sites located throughout Staten Island: the Department for the Aging (DFTA) senior centers, faith-based organizations, a non-profit, and a public library. Recruitment was also conducted by tabling at two community health events held in Staten Island. See Appendix A for site recruitment and recruitment flyer details.

One-hundred and twenty-four survey questions sought self-reported information on a wide range of established and emerging falls risk-related topics, such as the home environment, social isolation, fear of falling, chronic conditions, medications, and mobility. Specific domains included:

- Demographic characteristics;
- Information about where the subject lives and how they view their home and neighborhood;
- Specifics on the individual home environment and characteristics of the home and its rooms;
- Use of assistive devices, means of local transportation, and personal physical activity engagement;
- Social engagement in and out of the home;
- Health, vision, and health care access;
- Presence of falls risks and individual history of falls.

See Appendix B for the final survey instrument. See Appendix C for details on field operations. The NYC DOHMH IRB approved this project on March 6, 2018.

## **ANALYSES**

Descriptive statistics were computed to describe the study sample, and respondents' home environment, transportation and physical activity, social connections and health status. Further, among study participants who reported a fall in the past year, frequencies were computed to describe the circumstances surrounding their fall. Lastly, to examine any differences in falls risks between fallers and non-fallers, chi-square tests were run.

Narrative information from the open-ended survey questions was reviewed through an iterative process. Two members of the research team identified, coded and categorized recurring themes in the narrative data. Most frequently recurring themes pertaining to study participants' attitudes toward living at home while aging and their general health are presented below. These domains illuminate interpretation of the quantitative findings.

## SURVEY FINDINGS: QUANTITATIVE

### *General sample characteristics*

The sample consisted of 203 community-dwelling older adults living in Staten Island. Survey participant ages ranged from 65 to 98 years, with a mean age of 75 years. Over half the sample was between 65 and 74 years. Seventy-nine percent of participants reported their gender as female. The majority of older adults were White (57%), followed by Black or African American (29%), and Asian or Pacific Islander (7%). Most were non-Hispanic or Latino (92%). (Table 1)

	N (%)
<b>Gender</b>	
Male	42 (21)
Female	161 (79)
<b>Age years</b>	
65-74	111 (55)
75-84	63 (31)
≥85	29 (14)
<b>Race</b>	
White	115 (57)
Black	58 (29)
Asian	15 (7)
Other	12 (6)
<b>Hispanic or Latino</b>	
Yes	16 (8)
No	186 (92)

### *Home structure and environment*

Survey participants mostly lived in one- or two-family homes (48%) or apartments (47%). Renters represented more than half of participants (53%); 44% reported owning their apartment or home. About two-thirds (66%) had grab bars or handrails installed in their bathroom showers, and 39% had grab bars installed by their toilets. Eighty-one percent of older adults believed that their home was as well maintained as it could be. Most of the older adults considered their typical room in their home to be at low risk of clutter (97%). (Table 2)

	N (%)
<b>Type of housing</b>	
1 or 2 family home	98 (48)
Apartment	96 (47)
Other	9 (4)
<b>Home owned or rented</b>	
Own	90 (44)
Rented	108 (53)
Occupied without payment of rent	5 (3)
<b>Wall-mounted handrails or grab bars in bathroom showers or tubs</b>	134 (66)
<b>Wall-mounted handrails or grab bars by any of your toilets</b>	79 (39)
<b>Feel home is well maintained</b>	165 (81)
<b>Level of clutter in typical room</b>	
Low risk	196 (97)
High risk	4 (2)

Sixty-eight percent (n=138) of survey participants reported stairs in and around their home. Among these participants, 75% used their stairs daily. While most stairs reportedly had handrails (95%) and sufficient lighting (94%), fewer than one-third had some form of non-slip covering on stairs (29%). (Table 3)

	N (%)
<b>Frequency of stair use</b>	
Never	6 (5)
Sometimes	27 (20)
Daily	99 (75)
<b>Stairs have handrails</b>	126 (95)
<b>Stairs have some form of non-slip covering</b>	39 (29)
<b>Enough light near stairs</b>	128 (94)

**Assistive devices, transportation and physical activity**

More than half of survey participants reported that they did not drive at all in the past year (56%) (*data not shown*). Travel by bus was the most commonly used mode of public transportation (67%), followed by Access-a-Ride/Paratransit (door to door transportation provided by aging facilities - 42%).

Forty-one percent of older adults said that they never do exercises to increase their balance or strength. Approximately one-third (34%) reported doing these exercises weekly.

Just over half of the sample (53%) reported no use of cane or walker.

**Social interaction**

Over half (60%) of survey participants reported living alone. The majority (84%) of survey participants reported experiencing no loneliness. Fifty-seven percent reported that they had 4 or more people in their lives that they could talk to about personal affairs and/or spend leisure time with. Most (82%) of the older adults did not own pets, such as a dog or cat. Seventy-three percent of older adults did not report having a medical alert system in case of emergencies. (Table 5)

**Table 4. Transportation, assistive devices and physical activity characteristics of older adults (n=203)**

	N (%)
<b>Types of transportation used most often (n=173)*</b>	
Bus	116 (67)
Access-a-Ride/Paratransit	73 (42)
Subway	33 (19)
Bus	43 (25)
Ferry	
Other	18 (10)
<b>Frequency of balance or strength exercises</b>	
Never	84 (41)
Daily	45 (22)
Weekly	68 (34)
Monthly	6 (3)
<b>Use of a cane or walker</b>	
Yes	95 (47)
No	108 (53)

\*Percentages represent how many individuals reported a specific mode of transportation out of total number of individuals who used any public transportation (n=173). Percentages do not sum to 100 because some respondents used multiple transportation modes

**Table 5. Social characteristics of older adults (n=203)**

	N (%)
<b>Household composition</b>	
Live alone	122 (60)
Spouse or partner	41 (20)
Child/children	32 (16)
Other family	5 (3)
Friends and other	27 (13)
<b>Level of loneliness</b>	
Not lonely	171 (84)
Lonely	32 (16)
<b>Number of people close to you at the present time</b>	
None	4 (2)
1-3	84 (41)
4 or more	115 (57)
<b>Own any pets at home such as a dog or cat</b>	
Yes	36 (18)
No	167 (82)
<b>Own a medical alert system in case of emergencies</b>	
Yes	54 (27)
No	149 (73)

### **Health, vision and health care**

A small proportion of survey participants reported their overall health as excellent (7%), whereas 64% reported their health as very good or good. Most (92%) reported needing no help with basic tasks of everyday living.

Fifty-five percent of survey participants reported taking 4 or more prescription drugs, a number associated with risk of falling; 20% reported taking 4 or more over-the-counter (OTC) medications.<sup>14</sup> More than three quarters or 78% of older adults had their vision checked in the last year. Forty-two percent of survey participants reported contact with four or more health care providers in the past year. Twenty percent reported health care providers talking with them about falls prevention.

The study sample reported a range of health concerns often associated with a fall. Thirty-four percent reported living with diabetes and 22% reported living with osteoporosis. Sixty-five percent reported high blood pressure; 28% reported vitamin D deficiency as well as hearing problems. Twenty-seven percent reported foot disorder or foot pain, and 16% reported depression. Approximately half the sample reported being worried about falling. (Table 6)

<b>Table 6. Health, vision and health care indicators (n=203)</b>	
	<b>N (%)</b>
<b>Self-reported health</b>	
Excellent	14 (7)
Very good	51 (25)
Good	79 (39)
Fair	48 (24)
Poor	11 (5)
<b>Anyone helping with basic tasks of everyday living</b>	
Yes	17 (8)
No	186 (92)
<b>Number of prescription medications taken on a regular basis</b>	
None	18 (9)
1 to 3	73 (37)
4 to 5	59 (30)
6 or more	50 (25)
<b>Number of OTC medications taken on a regular basis</b>	
None	50 (25)
1 to 3	112 (55)
4 to 5	26 (13)
6 or more	14 (7)
<b>Vision checked in the last year</b>	
	158 (78)
<b>Number of different health care providers seen in the past year</b>	
1-3	113 (56)
4 or more	85 (42)
<b>Health care providers talked to you about fall prevention</b>	
	40 (20)
<b>Diagnosed with Diabetes</b>	
	68 (34)
<b>Diagnosed with Osteoporosis</b>	
	44 (22)
<b>Diagnosed with high blood pressure</b>	
	129 (65)
<b>Diagnosed with vitamin D deficiency</b>	
	54 (28)
<b>Diagnosed with hearing problems</b>	
	57 (28)
<b>Diagnosed with foot disorder/pain</b>	
	55 (27)
<b>Diagnosed with depression</b>	
	32 (16)
<b>Worried about falling</b>	
	101 (50)

### Characterizing falls

Twenty-nine percent of older adults reported a fall within the past 12 months. Most fallers were female (85%), and 60% percent of these falls occurred only once (*data not shown*).

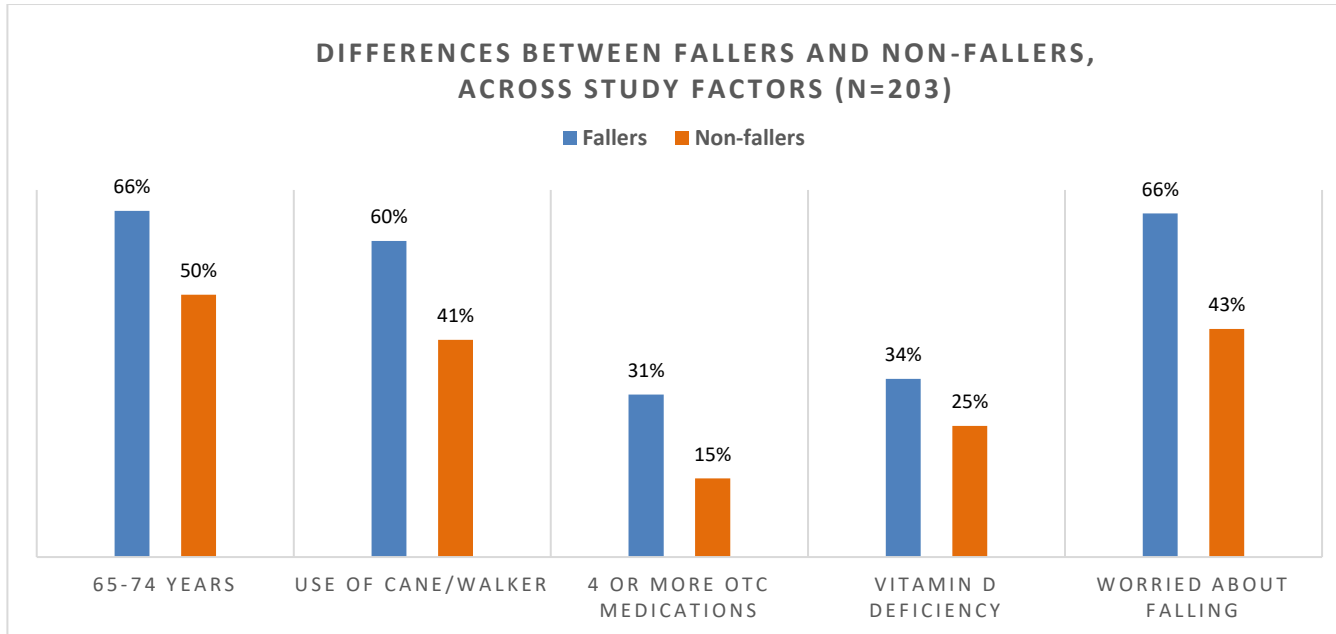
Approximately half (52%) of these falls resulted in an injury.

Fallers most commonly reported tripping (31%), losing balance (29%) or slipping (19%) as a cause for their most recent fall. Fifty-five percent occurred in the home, with 27% of these occurring on the stairs and 23% occurring in the living room. While 67% were alone during their fall, most told someone about their fall (85%). Family members (64%) and friends (24%) were most frequently informed of the fall. (Table 7)

<b>Table 7. Characteristics of falls in the past year (n=58)</b>	
	N (%)
<b>Had a fall in the last year</b>	
Yes	58 (29)
No	145 (71)
<b>Sustain an injury from fall</b>	
Yes	30 (52)
No	28 (48)
<b>Circumstances of fall</b>	
Slipping	11 (19)
Tripping	18 (31)
Losing balance	17 (29)
Getting on to or out of chair, sofa, bed	5 (9)
Reaching for something	6 (10)
<b>Location of fall</b>	
Home or apartment	31 (55)
Common area of residence	3 (5)
Sidewalk	9 (16)
Street crossing	3 (5)
Other	10 (18)
<b>Location of fall in home/apt</b>	
Stairs	8 (27)
Living room	7 (23)
Bedroom	4 (13)
Kitchen	4 (13)
Bathroom	2 (7)
Other	5 (17)
<b>Alone when fell</b>	39 (67)
<b>Told someone about fall</b>	49 (85)
<b>Person informed of fall</b>	
Family member	37 (64)
Friend	14 (24)
Doctor/medical professional	13 (22)
Neighbor	5 (9)
Other	9 (16)

### Fallers vs Non-fallers

When possible, we compared study participants who reported falling with those who did not across all study factors. Most factors were not significantly different for the two groups. The following graph highlights instances where there were differences.\* Specifically, study participants who fell, when compared with those who did not fall, were more likely to be 65 to 74 years old (66% vs 50%), to use a cane or a walker (60% vs 41%), to take 4 or more over the counter (OTC) medications (31% vs 15%), to report a vitamin D deficiency (34% vs 25%), and to be worried about falling (66% vs 43%).



\*Difference mean the chi-square test generated results that were significant at the p=.05 level or approached significance. All other study factors reported above were not significantly different between fallers and non-fallers.

## SURVEY FINDINGS: QUALITATIVE

### Comfort, familiarity and hassle

In the open-ended elements of the survey, several survey participants reported being very attached to their homes. They highlighted neighborhood conveniences such as being near shopping, transit options, and leisure activities as well as the familiarity that results from being in one place for a long time. Survey participants cited their living room as their favorite spot to occupy, as that is where the television is. Many said they wanted to stay in their homes, ideally until the day they died. Moving closer to family was a key reason cited for relocating. Upon deeper reflection, though, survey participants recognized aging may necessitate a change. Deteriorating health, impaired mobility, and struggle with activities of daily living may become obstacles to staying put. Some survey participants expressed that their current home is too big for them to manage now and that they would be interested in downsizing in order to cut back on maintenance work. Participants seemed to largely understand that declining health may eventually uproot their lives and home situations as they age.

While most survey participants did not identify immediate home repair needs, those who did unwittingly identified issues that contribute to falls risk. Maintenance issues included: “no light in stairwells;” “more outlets



needed in dining room and living room;” “when the time comes I may need grab bars;” “the rail in the shower is not as sturdy as it could be;” “the guard rail around the stairs needs to be fixed;” “boards on the deck need repairs;” “grab bars in the bathroom are loose,” “kitchen tiles are coming up;” “ floor has been buckling;” “Railing on steps outside the house has a post that is broken and it is also loose.” Barriers to getting any repair work done centered on non-responsiveness of maintenance staff, admitted inattention by the residents themselves and cost.

## **DISCUSSION AND PREVENTION IMPLICATIONS**

Study participants reported strong attachment to their homes, while also acknowledging that falls risks are present. Noteworthy was the frequent occurrence of falls happening while the older adult was alone. Also, falls happened with the highest frequency in the room identified as the place where this survey’s older adults like to spend a lot of time – the living room. There, companionship often takes the form of television. This sort of companionship certainly does not offer protective eyes on the older adult resident.

Over half of survey participants reported having stairs in and around their Staten Island homes. Daily use of stairs was high, and stairs were the site of nearly a quarter of the falls. Tripping and losing one’s balance were identified as prevalent contributors to falls. These Staten Island-specific discoveries point to the need for clear, targeted alerts about the risks for falls stairs can pose.

Interestingly, there were few significant differences between fallers and non-fallers with regard to many established environmental, behavioral and health factors for falls. The select differences that did emerge were intuitive and instructive. The younger age (i.e., 65 to 74 years) of the older adult fallers signals a potential greater exposure to falls risk, as the younger sub-group may be more ambulatory, active and engaged in their social and physical environments than the older sub-group of older adults. The higher prevalence of cane or walker use among fallers compared to non-fallers likely signals the use of assistive devices *after* a fall - a co-occurrence that makes perfect sense. The higher frequency of four or more OTC medications among fallers compared to non-fallers is consistent with the literature on polypharmacy.<sup>14</sup> Prescription drug polypharmacy did not emerge as a distinguishing characteristic between fallers and non-fallers, which could signal growing attention to and management of this falls risk factor by local health care providers. Extending that awareness among health care providers to OTC drugs is a sensible outreach step. The slightly higher prevalence of vitamin D deficiency among fallers compared with non-fallers is expected and comports with research identifying that deficiency as a falls risk factor.<sup>15</sup> While the effectiveness of vitamin D supplementation has been debated in recent years,<sup>16</sup> supplementation is likely worth individualized consultation with health care providers. Lastly, our findings confirm the long-established role worrying about a fall can play in contributing to a fall. Mitigating that worry through education, outreach and home risk management must be sustained elements of falls prevention messaging for older adults on Staten Island.

This study has a few limitations. The sample of older adults on Staten Island was drawn through convenient means. While we sought diversity through a variety of recruitment strategies, we very likely surveyed slightly healthier and more socially supported or engaged older adults by virtue of our recruitment approaches (See Appendix A). Also, resource constraints held us to one language for survey translation and administration, though we communicated in the language most commonly spoken among older adults on Staten Island.<sup>13</sup>

In closing, these limitations do not diminish the wisdom of promoting three actionable remedies:

1. **Stairs** should be prominently featured in home risk assessment and management for older adults living independently on Staten Island. Stairs are a featured part of the [DOHMH's Home Safety Checklist](#); DOHMH's Injury and Violence Prevention Program staff will emphasize that sub-section of the Checklist in our outreach activities on Staten Island.
2. While study participants did not report a high level of being lonely, the high frequency of being alone for a fall suggest the need for some **supportive companionship**. Toward that end, DOHMH is continuing its outreach, education and training to a broad range of service providers in the homes of older adults – e.g., superintendents, handy-people, occupational and physical therapists, case managers, etc. – to be ambassadors for falls prevention messages and actions. We aim to arm all who enter the homes of older adults with elevated awareness of the potential for falls in the home as well as guidelines for how to reduce risks.
3. DOHMH aims to **amplify usual falls risk management messages**, particularly with health care providers, related to OTC polypharmacy, vitamin D supplementation on an individualized basis, and worrying about a fall. Building a village of ambassadors for falls prevention (as indicated above) may also contribute to managing the worry-factor.

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