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Prevalence and Correlates of Functional Status in an Older Community-Representative Sample in Brazil

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Abstract

Objective—Information on dependency level of elderly in rapidly aging developing countries is limited, but is needed to ascertain extent of need for help with activities of daily living (ADLs).

Methods—In-person information was obtained in 1995 from a statewide survey of representative community residents 60 years of age in the state of Rio Grande do Sul, Brazil (N=7040), on demographic characteristics, health conditions, social ties, health behaviors, and ADL performance.

Results—Nearly 40% needed help with one or more ADLs. In controlled analyses, need for help approximately doubled with each succeeding decade. Increased education and income and regular physical activity reduced risk. Selected health conditions (stroke, depression, poor self-rated health) were consistently associated with need for help.

Discussion—A large proportion of noninstitutionalized elderly have ADL problems. In addition to health care, interventions promoting equity of access to education and economic opportunity could reduce ADL dependency in coming generations.

Keywords

activities of daily living; elderly; representative community sample; cross-sectional study

While preventive medicine is already being promoted and practiced in Brazil (Lei Orgânica da Saúde -1990), maintenance of personal independence is also important. Functional status has been shown to decline with increase in age, is generally more problematic for those of lower income and education, for women than for men (but varies with the task and with the culture), and may be associated with race/ethnicity (Camargos, Machado, & Rodrigues, 2007; Jagger, Arthur, Spiers, & Clarke M, 2001; Kington, & Smith, 1997; Wray, & Blaum,

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2001). Health conditions, in particular stroke and depression, and chronic conditions such as arthritis have been found to be associated with adverse functional status (Alves et al., 2007; Boulton, Kane, Louis, Boulton, & McCaffrey D, 1994; Stuck, et al., 1999; Verbrugge, Lepkowski, & Imanaka Y, 1989), while social characteristics and health behaviors may be protective for continued independence (Hays, Saunders, Flint, Kaplan, & Blazer, 1997; Manton, 2008; Stuck, et al., 1999).

While descriptive information on functional status in the elderly in major cities and smaller localities in South America and the Caribbean is now available (Laks, et al. 2005; Lopes, et al., 2007; Melzer, & Parahyba, 2004; Palloni, Peláez, Wong, 2006; Santos, Koszuoski, Dias-da-Costa, & Pattussi, 2007), with rare exceptions (Alves, et al., 2007; Menéndez, Guevara, Arcia, Díaz, & Marín, 2005), few studies have been published that have controlled for characteristics that could explain the findings. Absence of controlled studies limits the accuracy with which interventions can be planned.

The present study uses data from a statewide survey of representative community residents 60 years of age in the southeastern state of Rio Grande do Sul, Brazil (Conselho Estadual do Idoso, 1997). It examines the prevalence of self-reported need for help with activities of daily living (ADL), identifies the main patterns of disability present, and notes the association of demographic factors, health conditions, social ties and health behaviors with need for help in performing ADL tasks. The findings facilitate identification of the characteristics associated with loss of independence in older community residents, and indicate potentially modifiable characteristics where intervention could reduce the likelihood of dependence. This is an important issue, given the rapid aging of the population, and the potential burden of an increasing number of dependent elderly.

METHODS

Data

This cross-sectional study of persons 60 years of age or older, was based on a multistage, stratified random-sampling procedure. The aim was to draw a sample from nine homogeneous areas covering the entire state of Rio Grande do Sul, in the southern region of Brazil. This region has a largely agro-industrial economy, and is populated primarily by descendants of European immigrants. The first step was to stratify the 333 municipalities into five categories according to basic economic activity and number of inhabitants. The proportion of each category in each homogeneous zone was calculated, and the number of subjects in each stratum needed to obtain a representative proportion of elderly community residents was determined. Second, the municipalities were randomly selected proportionally in each stratum. The third step was to obtain a random sample of urban census areas for each municipality as supplied by the Brazil Geography and Statistics Institute (Instituto Brasileiro de Geografia e Estatística; IBGE). Fourth, to get a sample of private households from each of these census areas, a block was randomly selected and every eighth house was systematically visited in person by the interviewer. If a household had more than one age-eligible person, the respondent was randomly selected. Houses with no eligible person were replaced by the next neighbor.

Data were gathered in 1995 by specifically trained, closely monitored interviewers, using structured face-to-face household surveys with 7920 residents of urban and rural counties. To increase the quality of data collection, all interviewers and field supervisors underwent in-class training. This included a detailed description of the research project and its methodology, role-playing techniques, and tests of fieldwork reliability. Tape recorded interviews were used to discuss the research instrument, improving both interviewing skills and data collection techniques. Field supervisors closely monitored data collection, and

revisited participants to ensure fieldwork quality control. No adjustment had to be made to the procedure in the course of fieldwork.

Data entry problems were identified in one region, which was then excluded from analysis. In the remaining eight regions, 7040 persons were approached: 880 subjects in each area. No proxy information was collected. Only 77 persons (1.1%) did not take part in the assessment, primarily refusals, yielding an overall response rate of 99% (N = 6963).

The structured interview included assessment of sociodemographic characteristics, mental and physical health, functional status, health service use, activity (exercise and employment), and living arrangements. The study was approved by the Ethics Committee of the Federal University of São Paulo. Participants gave oral consent.

Primary outcome

Dependence in ADL was assessed by response (no, yes, don't know, no response) to each of five items asked in the following order, with the examples indicated: "Do you need help performing household activities (cleaning, maintenance, meal preparation ...)?, taking medications?, with personal hygiene (bathing, combing hair, dressing, cutting nails...)?, feeding yourself?, with mobility (sitting down, getting up, lying down, walking, going up stairs...)? Response categories of "don't know" and "no response" were rare, and were recoded conservatively to "no" (need no help).

Independent variables

Demographic measures included gender, age (years), race/ethnicity (Caucasian, African-Brazilian, Asian, Mulatto), education (0–3 years, 4 years), and income (low income <US \$200/month, high income US\$200/month).

Health measures included self-rated health, assessed by asking participants "How would you consider your health?", with response dichotomized as poor (fair, bad, very bad) vs. good (good, very good). Participants also self-reported on the presence of 19 medical conditions (see Table 1). With the exception of depression (measured by a validated Brazilian modification of the Short Psychiatric Evaluation Scale (Blay, Ramos & Mari, 1988; Pfeiffer, 1979), and headache, for which information was asked about the previous month, participants were asked whether the health condition had been present in the previous six months. Self-report of vision and hearing asked "How would you consider your sight/hearing at this moment"? Response to vision was dichotomized as normal (excellent, good) vs. impaired (fair, bad, very bad, blind). Response to hearing was dichotomized as not impaired (no difficulty hearing), vs. impaired (any of the following: completely deaf; great difficulty, difficulty, some difficulty hearing).

Social ties and health behaviors included marital status (married/cohabiting, no longer married/cohabiting, never married); whether participating (yes, no) in social activities, religious activities; physically active at least once a week; and currently smoking tobacco.

Statistical methods

Descriptive statistics were used to characterize the sample, and assess prevalence of needing help with ADL tasks. We examined the factorial structure of the five ADL items using Principal Components Analysis with quartimax rotation with Kaiser normalization. All variables loaded on factor 1 (eigenvalue 2.51, 50.13% variance explained). Cronbach's alpha is 0.70, which is within the acceptable range of reliability. The resulting summed scale was used in uncontrolled analyses. However, since the individual tasks might be differentially affected by demographic characteristics, health conditions, social ties and

health behaviors, in controlled analyses we examined each task separately using logistic regression.

Since the number of people requiring help with certain tasks was small, we first refined each of the three sets of independent variables (demographic characteristics, health conditions, social ties and health behaviors), by running individual chunk tests for each ADL task (e.g., regressing household tasks on health conditions entered as a chunk). All chunks being significant, we selected for inclusion in further analyses the statistically significant variables in each chunk. Three models were then run for each ADL task. Model 1 included only demographic characteristics, Model 2 added social ties and health behaviors Model 3 further added health conditions. Multivariate significance tests were carried out using Wald χ^2 tests. Statistical significance was evaluated using 2-tailed tests, with $P < 0.01$ for significance to control for Type I error inflation. Analyses were performed using SPSS 15.0.

RESULTS

The sample was preponderantly female, under age 70, white, and with low education and income (Table 1). A larger proportion of women, older persons, the socioeconomically disadvantaged, those with health conditions, with poorer social ties and lacking activities reported needing help with ADL tasks.

Prevalence and patterns of needing help with ADL tasks

While 60.5% stated that they required no help with any of the five activities, the percentages requiring help were: household tasks-- 34%, taking own medications--12%, mobility--10%, personal hygiene--8%, feeding self--3%. The combination of tasks with which help was needed was semi-hierarchical (Table 2). Nearly a quarter of the sample needed help with only one task, preponderantly household tasks (20.6%). About one in 14 needed help with two tasks (typically household tasks and taking medicine, or household tasks and mobility). One in 27 needed help with three tasks, typically household tasks and alternative combinations of taking medicine, mobility and personal hygiene. One in 43 required help with 4 tasks (typically all but eating), while 1.6% required help with all tasks.

Uncontrolled analyses

Overall, the mean number of ADL problems was 0.67 (standard deviation 1.08).

Uncontrolled analyses indicated that, for each task, the percentage needing help increased with age, and within each age category was greater for women than for men (Table 1 and Figure 1), doubling between ages 60–69 and 80 and over for household tasks, and for all others doubling with each increasing decade (60–69, 70–79, 80). While the average number of ADL problems was greater when any health condition was present, this was particularly so for (in descending order), stroke, pneumonia, depression, cancer, and at comparable levels: diabetes, urinary infection, and osteoporosis. With the exception of living with others, the average number of ADL problems was greater for people with fewer social connections.

Controlled analyses

With only demographic characteristics controlled (Table 3, Model 1), gender differences were found only for household tasks, and mobility. There was a near doubling of need for help among 70–79 year olds as compared to 60–69 year olds, and a three- to six-fold increase among those age 80 and over. Increased education and higher income independently were associated with reduced need for help with any task.

The addition of significant health conditions modified the impact of the demographic characteristics (Table 3, Model 3. Model 2 is not presented since social ties and health behaviors barely modified demographic and health characteristics when they were added.) Women still needed help with household tasks, men needed help taking medication. Mobility, personal hygiene, and self-feeding became gender-fair. Higher education and income were no longer consistently protective.

Stroke and depression were associated with needing help for each of the ADL tasks. Poorer self-rated health was associated with all tasks except self-feeding. Hearing was associated only with household tasks and with taking medications; diabetes and osteoporosis with household tasks and mobility; pneumonia with all but household tasks, and backache with none. Chunk analysis had indicated that the other health conditions present were not significantly associated with need for ADL help. They were therefore not included in analysis.

Social ties and health behaviors (Table 3, Model 3), made a unique contribution, and modified little the effect of previously entered demographic characteristics or health conditions. No longer being married/cohabiting was associated with needing help with medications, while living with others was associated with need for help with all tasks except self-feeding. Nonparticipation in social activities was associated with poor mobility and need for help with personal hygiene, while absence of physical activity was associated with need for help with all tasks.

DISCUSSION

Our data come from an epidemiological study of a large representative sample of elderly community residents 60 years of age and older in Brazil – a developing country. The response rate was high, but high response rates are not uncommon in epidemiological studies in developing countries (1.6% nonresponse rate in Nigeria [Hendrie et al., 1995], even lower in rural India [Chandra et al., 1998]). The information available permits determination of the extent to which ADL problems exist in this statewide survey of representative community residents 60 years of age in the southeastern region of Brazil, and allows identification of the demographic, health, social and health behavior characteristics associated with ADL dependence. Potentially, the findings permit identification of interventions that could facilitate personal independence.

The extent to which help is needed is substantial – 39.5% need help with one or more activities. Need for help, however, is not evenly distributed across tasks or across people, and tasks are differentially affected by different characteristics. A hierarchical pattern of need for help was found 66.6% of the time, with a semi-hierarchical pattern the remainder of the time. Thus, individual evaluation remains necessary if services are to be provided appropriately. Need for help was most frequently reported for household activities, a type of activity not requiring specialized personal care skills (Isaacs & Neville, 1976), and likely within the capability of the informal network. Help with other activities, however (mobility, personal hygiene), may require more formal training.

In this study, race was not a significant determinant of need for ADL help. Unfortunately, race is not inconsequential throughout Brazil. Mestizo/Native elders in the São Paulo site of the Health, Well-being and Aging in Latin America and the Caribbean (SABE) study reported a higher prevalence of difficulty than did Whites or Blacks/Mulattos (Guerro, Alvarado, Zunzunegui, 2008). Other studies from Brazil do not refer to race, suggesting that this characteristic may be considered to be irrelevant, or too difficult or inappropriate to measure.

In analyses controlled for demographic characteristics, there were no gender differences in need for help with basic self-care tasks, but women were more likely to say that they needed help with household tasks (perhaps their household tasks are more demanding, or their standards are higher), while men were more likely to need help with medications. Need for help increased markedly with age.

When health conditions were taken into account, increased education ameliorated some problems and higher income ameliorated others. A consistent association has been shown between increased education, adequate income, and better health and functional status (Banks, Marmot, Oldfield, & Smith, 2006; George, 1996; Kington & Smith, 1997; Manton, 2008; Manton, Gu, & Lamb, 2007; Pampel, 1998). Together with preventive medical care that is already practiced, improved education and access to economic opportunity should be considered as long term interventions likely to result in improved health and functional status in both the earlier and later years. Brazil has already made significant strides in this direction by ensuring more adequate funding through the first eight grades, an intervention that appears to be succeeding by improving school enrollment rates, and reducing illiteracy levels (de Mello & Hoppe, 2005; Brazil Geography and Statistics Institute, each accessed October 1, 2009). While the cost of such intervention is not inconsequential, it would hopefully be offset at the individual, state, and national levels by lower lifetime medical care costs, improved material circumstances, and a better economy.

As have others, we found that stroke and depression had an adverse effect across all ADL tasks (Brenes, et al., 2008; Ford, et al., 1988; Furner, Rudberg, & Cassel, 1995; Guccione, et al., 1994; Verbrugge, Lepkowski, & Imanaka, 1989), while other health conditions were task specific. Our data also confirm the importance of self-rated health in providing information beyond that provided by specific health conditions (Furner, Rudberg, & Cassel, 1995; Idler & Benyamini, 1997). Elderly who lived with others were more likely to require help, suggesting that they had either been able to age in place, or that non-institutional arrangements had been made for them. Living with others seems to provide a safety net.

Absence of physical activity was found to be a substantial risk factor for needing help with ADL tasks, while lack of participation in social activities was associated with problems with mobility and personal hygiene. Since this study is cross-sectional, it is unclear whether these associations reflect cause or consequence. Exercise is increasingly being recognized as important to good health. Exercising need not be expensive -- walking is typically encouraged (Clark, 1996), but ensuring a safe environment, and persuading people to exercise may not be easy. As found in previous studies (Fillenbaum, Burchett, & Blazer, 2007), current use of tobacco was not associated with need for help with ADL tasks. These smokers may be survivors.

Comparison with other reports is difficult. The specific tasks at interest differ across studies. Some studies count the number of problematic tasks and do not consider specific tasks. Analyses are not always controlled. Nevertheless, our finding that age, but not gender, is associated with performance of basic activities is confirmatory (Menéndez, et al., 2005) although whether, in highly developed countries, increased education and income are generally protective is unclear (Boult et al., 1994; Landerman & Fillenbaum, 1997; Ostchega, Harris, Hirsch, Parsons, & Kington, 2000). Similarly, the health conditions examined tend to vary across studies. Chunk analysis reduced our original listing of 19 health conditions to seven conditions. The excluded conditions were not necessarily inconsequential, indeed several (e.g., cardiovascular conditions, arthritis) have been found to be associated strongly with ADL problems (Verbrugge, Lepkowski, & Imanaka, 1989).

The association of health conditions with need for ADL help suggests that intervention to reduce the incidence of implicated health conditions, or to better control them, might reduce or delay a cascade of needing help with daily tasks, and facilitate independence. It has been suggested that improved medical care rather than reduction of chronic conditions underlies decline in disability in the US (Freedman, Schoeni, Martin, & Cornman, 2007; Manton, 2008). Appropriate interventions for the implicated conditions are known, and fit well with Brazil's focus on preventive care. In particular, the development and increasing reach of the Family Health Program, whereby multidisciplinary health care teams are responsible for the health care needs of families within a defined geographic area, shows promise for reducing health care issues (Aquino, de Oliveira, & Barreto, 2009; Barreto & Aquino, 2009).

This study has several limitations. Perhaps foremost, the functional status items used do not constitute a scale with established validity and reliability. Factor analysis, however, indicated that all five items fall on a single factor, with acceptable reliability. Nevertheless, in controlled analyses we preferred to examine the individual items, since previous work has indicated that associations may be task-specific (Landerman & Fillenbaum, 1997). Three of the five items combine several activities, reducing ability to identify specific problems. Combining tasks is, however, a procedure frequently used when information is sought from a generally healthy population (U.S. National Health Interview Survey, 2008).

Question phrasing has been shown to affect findings. Participants were asked whether they needed help. Findings might have been different had participants been asked about level of difficulty, or limitations in task performance (Rodgers, & Miller, 1997).

All information was self-reported. Self-reported ADL, and in particular of need for help with ADL tasks has been found to be reliable (Crawford, Jette, & Tennstedt, 1997), as has self-report of health conditions (Beckett, Weinstein, Goldman, Yu-Hsuan, 2000). Sample size for some outcomes did not permit examination of combinations of health conditions, and information on cognitive status was absent. Those in institutions and the homeless are not represented in this study. Little information regarding the size of each of these groups is available; however, it has been estimated that the homeless may represent 0.06% of city dwellers, and of these homeless, 14% are 56 years of age or older, while the institutionalized represent less than 1% of city residents age 65 and over (Chaimowicz, & Greco, 1999; Federal Government, 2008). Thus current findings are expected to be affected little by their absence. Our data are cross-sectional, making it difficult to distinguish among cause, consequence and coincidence. Longitudinal studies are needed to help to identify the characteristics of persons for whom help with ADL tasks is needed only temporarily.

On the positive side, these data reflect the status of a large, representative sample of older persons, while the controlled analyses took into account multiple factors, permitting identification of the independent association of individual characteristics.

In summary, nearly 40% of these representative community residents 60 years of age report that they need help with ADLs. They include the oldest, the socioeconomically disadvantaged, those with certain health conditions, and elderly who live with others. Increased education (Manton, Gu, & Lamb, 2007), and higher income (Kington & Smith, 1997), were associated with better functional status. Certain health conditions were associated with poorer functional status, suggesting that medical care, particularly regarding stroke, depression, and pulmonary disorders (Manton, 2008; Ostchega et al., 2000), and encouragement of physical activities such as walking (Clark, 1996) may reduce the risk for need for help with activities of daily living. Institutionalization is currently rare in this geographic region. Support for multiperson households that include a functionally disabled older person should be considered in order to delay the introduction of undesired

institutions. Importantly, approaches such as increased education, known to result in improved functional status in older age, also improve well-being and health in the younger years. While such intervention may initially be costly, the long term effect is likely to be advantageous at both an individual and a population level.

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Figure 1. Percentage needing help with activities of daily living (household, medication, mobility, hygiene, feed self), by age and gender

Table 1

Characteristics of the sample by specific ADL activities

	N (%)	ADL problems Mean (sd) 0.67(1.08)	Household tasks %	Take medications %	Mobility %	Personal hygiene %	Feed self %
<u>Demographic characteristics</u>							
Gender							
Male	2366 (34.0)	0.52 (0.98)	26.0	10.8	6.8	6.1	2.4
Female	4592 (66.0)	0.75 (1.13)	38.7	12.0	12.0	8.6	3.2
Age							
60–69	3941 (56.8)	0.47 (0.86)	27.2	7.2	6.3	4.1	1.7
70–79	2276 (32.8)	0.77 (1.13)	39.8	13.8	12.0	8.7	3.2
80+	717 (10.3)	1.46 (1.53)	53.6	28.9	26.4	24.5	8.9
Race/ethnicity							
White	5860 (84.2)	0.65 (1.07)	33.8	10.5	10.0	7.6	2.7
African-Brazilian	472 (6.8)	0.79 (1.16)	36.4	16.5	14.0	7.8	4.0
Other	625 (9.0)	0.79 (1.17)	38.2	18.0	9.9	8.7	4.2
Education							
<4 y	4574 (66.2)	0.76 (1.16)	36.7	14.9	12.4	9.3	3.6
4+ y	2340 (33.8)	0.47 (0.85)	29.7	5.1	5.9	4.5	1.6
Income							
Low income	4323 (64.2)	0.76 (1.16)	37.2	14.4	12.0	9.2	3.7
Higher income	2414 (35.8)	0.47 (0.85)	28.8	6.2	6.4	4.1	1.2
<u>Health conditions</u>							
Self-rated health							
Poor	4398 (63.5)	0.83 (1.17)	41.2	14.6	13.5	9.8	3.6
Good	2524 (36.5)	0.39 (0.83)	22.5	6.3	4.5	4.0	1.7
Vision (impaired)	4850 (70.1)	0.73 (1.12)	36.7	12.9	11.6	8.4	3.4
Hearing (impaired)	2365 (34.2)	0.84 (1.18)	40.9	15.9	13.4	10.1	3.8
Stroke	254 (3.6)	1.76 (1.70)	59.8	39.4	31.5	33.1	11.8
Heart condition	1962 (28.2)	0.91 (1.20)	45.3	16.6	15.2	10.8	3.7
Hypertension	3410 (49.0)	0.78 (1.15)	39.4	13.7	12.7	9.0	3.3

	N (%)	ADL problems Mean (sd) 0.67(1.08)	Household tasks %	Take medications %	Mobility %	Personal hygiene %	Feed self %
Diabetes	761 (11.0)	0.98 (1.26)	46.6	17.1	18.4	11.7	3.8
Cancer	94 (1.4)	1.01 (1.38)	41.5	19.1	19.1	14.9	6.4
Urinary infection	1222 (17.6)	0.98 (1.28)	45.9	19.2	16.2	11.7	5.0
Pneumonia	459 (6.5)	1.17 (1.44)	48.1	24.7	19.6	15.9	8.2
Headache	2248 (39.9)	0.82 (1.18)	39.9	15.6	13.3	9.2	4.0
Pulmonary problems	1917 (27.6)	0.84 (1.17)	41.7	16.0	13.1	9.9	3.7
Gastrointestinal problems	1272 (18.3)	0.77 (1.11)	39.9	13.2	12.2	8.1	3.2
Dermatological problems	724 (10.4)	0.84 (1.17)	42.7	16.9	11.7	9.9	3.0
Backache	2999 (43.1)	0.75 (1.12)	39.0	12.1	12.4	8.2	3.4
Rheumatism/ arthralgia	3001 (43.1)	0.80 (1.15)	40.1	14.2	12.7	9.5	3.7
Varicose veins	1197 (17.2)	0.74 (1.08)	38.3	12.1	12.5	8.2	2.6
Osteoporosis	1047 (15.0)	0.98 (1.20)	50.6	15.0	17.3	11.1	3.9
Depression	2722 (39.1)	1.02 (1.29)	47.0	19.7	17.3	12.9	5.0
Kidney problem	897 (12.9)	0.87 (1.27)	39.0	17.5	13.7	11.6	5.4
Social ties and health behaviors							
Marital status							
Married	3159 (45.4)	0.54 (0.94)	29.6	9.1	7.6	5.3	2.0
Single	471 (6.8)	0.61 (1.06)	29.3	10.9	9.6	7.7	3.0
No longer married	3327 (47.8)	0.80 (1.19)	39.5	14.0	12.8	10.0	3.8
Living arrangement							
Alone	1056 (15.2)	0.52 (0.91)	30.5	7.0	7.5	4.7	2.6
With others	5893 (84.8)	0.70 (1.10)	35.1	12.4	10.7	8.3	3.0
Social activities							
Yes	2736(39.5)	0.57 (0.92)	33.4	9.4	7.0	5.2	1.7
No	4221 (60.7)	0.74 (1.18)	34.9	13.0	12.3	9.3	3.8
Religion-activity							
Yes	4964 (71.5)	0.65 (1.04)	34.7	11.2	9.1	6.9	2.6
No	1977 (28.5)	0.73 (1.18)	33.8	12.5	13.1	9.9	3.8
Physical activity							
Yes	2608 (37.7)	0.45 (0.81)	28.0	7.3	4.8	3.8	1.0

	N (%)	ADL problems Mean (sd) 0.67(1.08)	Household tasks %	Take medications %	Mobility %	Personal hygiene %	Feed self %
No	4316 (62.3)	0.80 (1.20)	38.4	14.2	13.6	10.1	4.1
Tobacco (current use)							
Yes	1302 (18.8)	0.63 (1.09)	30.7	12.0	9.5	7.5	3.2
No	5632 (81.2)	0.68 (1.08)	35.3	11.5	10.4	7.7	2.9
Total [†]	6958	0.67 (1.09)	34.3	11.6	10.2	7.7	2.9

[†]There are missing data for some variables

Table 2

Number and main patterns of ADL problems. Tasks have been arrayed in descending order of frequency of needing help.

Activities of Daily Living						N	%					
Household	Medicine	Mobility	Hygiene	Feed self								
No help needed						4212	60.5					
Help needed with 1 task						1699	24.4					
+	+	+	+	+	1436	20.6						
					135	1.9						
					86	1.2						
					40	0.6						
					2	<0.1						
					492	7.1						
Help needed with 2 tasks						200	2.9					
+	+	+	+	+	185	2.7						
+	+	+	+	+	49	0.7						
+	+	+	+	+	22	0.3						
					12	0.2						
					11	0.2						
					9	0.1						
					3	<0.1						
					259	3.7						
Help needed with 3 tasks						76	1.1					
+	+	+	+	+	69	1.0						
+	+	+	+	+	64	0.9						
+	+	+	+	+	20	0.3						
+	+	+	+	+	12	0.2						
					9	0.1						
					6	0.1						
					158	2.3						
					Help needed with 4 tasks							

Activities of Daily Living					N	%
+	+	+	+	+	116	1.7
+	+		+	+	26	0.4
+		+		+	8	0.1
	+	+	+	+	5	0.1
Help needed with all 5 tasks					109	1.6
+	+	+	+	+		

+ = help needed

blank cell = no help needed

Percentages do not total 100 because some rare combinations have not been included.

Table 3

Association of demographic characteristics, health conditions, and social ties and health behaviors with need for help in five activities of daily living. (Conditions that are significant have been bolded.)

	Household tasks		Medication		Mobility		Personal Hygiene		Feeding self	
	OR [†]	99% CI [‡]	OR	99% CI	OR	99% CI	OR	99% CI	OR	99% CI
Model 1. Demographic characteristics only										
Gender (female)	1.64[§]	1.41, 1.91	0.88	0.70, 1.10	1.56	1.21, 2.01	1.10	0.83, 1.45	0.98	0.64, 1.52
Age 60–69										
70–79	1.72	1.41, 1.99	1.91	1.52, 2.40	1.89	1.48, 2.41	2.11	1.57, 2.82	1.66	1.05, 2.62
80+	3.25	2.60, 4.06	4.46	3.38, 5.89	4.58	3.43, 6.11	6.57	4.77, 9.05	4.74	2.93, 7.69
Education ≥4 yrs	0.80	0.69, 0.93	0.38	0.29, 0.50	0.53	0.40, 0.70	0.58	0.43, 0.80	0.55	0.32, 0.93
Income (higher)	0.86	0.73, 0.99	0.52	0.40, 0.67	0.69	0.53, 0.90	0.54	0.39, 0.74	0.37	0.21, 0.65
Model 3[†]. Demographic characteristics, health conditions, and social ties and health behaviors										
Demographic characteristics										
Gender (female)	1.38	1.15, 1.65	0.72	0.55, 0.94	1.20	0.89, 1.62	0.88	0.63, 1.22	0.77	0.46, 1.26
Age 60–69										
70–79	1.65	1.41 1.93	1.82	1.42, 2.34	1.79	1.37, 2.33	2.03	1.48, 2.78	1.48	0.91, 2.42
80+	3.17	2.48, 4.06	3.99	2.90, 5.50	4.41	3.16, 6.16	6.09	4.19, 8.84	3.65	2.09, 6.35
Education ≥4 yrs	0.99	0.84, 1.16	0.47	0.35, 0.64	0.71	0.53, 0.95	0.78	0.55, 1.09	0.71	0.40, 1.24
Income (higher)	0.97	0.82, 1.14	0.60	0.46, 0.79	0.84	0.64, 1.12	0.64	0.45, 0.89	0.48	0.27, 0.85
Health conditions										
Self-rated health (poor)	1.38	1.15, 1.65	1.44	1.09, 1.90	1.96	1.43, 2.69	1.52	1.08, 2.15	1.17	0.69, 1.99
Hearing (impaired)	1.23	1.06, 1.43	1.32	1.05, 1.64	1.15	0.90, 1.44	1.08	0.82, 1.42	1.00	0.66, 1.52
Stroke	1.65	1.41, 1.93	3.40	2.29, 5.07	2.68	1.76, 4.07	4.34	2.83, 6.67	2.92	1.57, 5.42
Diabetes	3.17	2.48, 4.06	1.31	0.96, 1.80	1.84	1.35, 2.50	1.22	0.83, 1.79	1.01	0.55, 1.86
Pneumonia	1.27	0.96, 1.67	1.83	1.30, 2.58	1.48	1.02, 2.13	1.68	1.12, 2.53	2.43	1.43, 4.14
Backache	1.04	0.89, 1.21	0.82	0.65, 1.04	1.11	0.90, 1.46	0.92	0.69, 1.21	1.11	0.73, 1.69
Osteoporosis	1.65	1.35, 2.00	1.22	0.92, 1.63	1.50	1.17, 2.05	1.30	0.93, 1.82	1.08	0.64, 1.82
Depression	1.80	1.54, 2.09	2.54	2.00, 3.21	2.11	1.64, 2.70	2.26	1.69, 3.02	2.32	1.46, 3.68

	Household tasks		Medication		Mobility		Personal Hygiene		Feeding self	
	OR [†]	99% CI [‡]	OR	99% CI	OR	99% CI	OR	99% CI	OR	99% CI
Social ties and health behaviors										
Marital status:										
Married		Reference		Reference		Reference		Reference		Reference
Never married	0.88	0.64, 1.20	1.12	0.70, 1.81	1.04	0.63, 1.71	1.26	0.71, 2.23	1.23	0.51, 2.93
No longer married	1.15	0.96, 1.36	1.37	1.06, 1.78	1.18	0.89, 1.56	1.37	0.99, 1.89	1.48	0.89, 2.44
Living arrangement (Live with others)	1.52	1.23, 1.89	2.41	1.67, 3.47	1.75	1.22, 2.51	2.57	1.63, 4.05	1.50	0.81, 2.77
Social activities - no	0.92	0.80, 1.07	1.09	0.87, 1.38	1.46	1.13, 1.88	1.36	1.02, 1.82	1.51	0.95, 2.41
Physical activity - no	1.27	1.04, 1.48	1.42	1.11, 1.82	2.13	1.60, 2.84	1.84	1.33, 2.55	2.73	1.52, 4.90
Use tobacco - no	1.00	0.82, 1.21	1.10	0.83, 1.47	1.07	0.78, 1.46	1.07	0.75, 1.53	1.084	0.64, 1.83

[†]OR = Odds ratio

[‡]CI = Confidence interval

[§]All bolded values are significant at P<.001 except as indicated below:

Model 1. Household tasks: income significant at p<.009 Feeding self: age 70–79 significant at p<.005, education significant at p<.003

Model 2 (Demographic characteristics + health conditions) not displayed since values are comparable to those of Model 3.