Prevalence of Disability - some correlates in four Latin American metropolises

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Introduction [2]

Over the next 25 years the elderly people in Latin America and the Caribbean will hugely increase in relative and absolute terms according to every available forecasting (See for example, United Nations, 2003). This aging process will increase the demands for health care to elderly people that up to now has been modeled to attend a rather young population. In this almost certain scenery, where the eldest elders –those aged 80 or more years- will probably grow at rates higher that 4.0- and knowing that functional decline is mostly an age-related condition, disability is a central issue of the Health research agenda in LAC.

The paper describes the pattern of disability among elderly population according to selected socio-economic characteristics using data from four Latin American urban settings.

There are several reasons that justify research on this subject; above all, functional decline and/or disability and the health care provided to these conditions are clear indicators of quality of life at older ages. Also knowledge on functional decline and its relationships are necessary in designing prevention programs and other public health measures that target disability among older persons. Identification of factors associated to disability will be useful inputs for intervention programs oriented to diminishing functional impairment since increments in the latter is associated with increasing needs for social services and medical care (Fried and Guralnick, 1997)

Functional disability predicts mortality and nursing home needs, but also poor function is associated with increased medical costs (Morley, 2003). The functional status has been proved to be a reliable predictor of health care use, specifically the community–based formal services (Tennstedt et *al*.1990). Disability, however, may reverse if there are adequate interventions to do so, thus modifying the impact on health care expenditure; recently, high

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[2] This paper includes some results reported in "*Health of Older Persons - Some findings from the PAHO Multicenter Survey SABE" - Presented at the XXXVIII Meeting of the Advisory Committee on Health Research/ Washington, D.C., 3–5 November 2003 – PAHO Headquarters*, by Martha Peláez, Laura R. Wong, Rebeca Wong and Alberto Palloni. Remaining errors are, however solely responsibility of the author.

rates of recovery among newly disabled elders has been found in developed settings (Gill and Kurland; 2003), and important proportion of dependent elderly people has returned to independence over a period of 18 to 24 months (Katz *et al*. 1983; Rogers *et al*., 1989). Finally, while efforts have been dedicated to study cross sectional correlates and longitudinal predictors of disability and functional impairments in high income countries, scarce research on functional impairments in LDC, however, impede to evaluate how well programs oriented to disable elderly people may work in Latin American population

1. Data and Methods and Definitions

Data used in this study are from comparative community based Surveys on Health and Well-being and Ageing (SABE) conducted in 1999/2000 in seven urban settings in Latin American and the Caribbean (See: Peláez *et al*. 1999).

Nearly 11,000 individuals aged 60 years or more living in the community were interviewed based in a complex, stratified, multistage, cluster sampling design. This study refers to four of these settings: Buenos Aires, Mexico City, Santiago and Sao Paulo; they represent big metropolis -with more than five million people in Santiago and more than ten million in the other three. Their corresponding countries constitute altogether about two thirds of the total population of the Region, it is an important share that, we believe, it portraits much of the urban Latin American elderly population.

Proportions of elderly people with disability are presented as a first approach to evaluate prevalence of disability; a pairwise correlation is presented in order to quantify the relationship between functional status, some socio-economic characteristic and health conditions. Finally a more complex model to measure the probability of having limitations to perform at least one limitation for activities of daily life (ADL) is included.

Definitions

Functional Status refers to the tasks a person performs within the context of daily life. These tasks are usually related to activities of daily living (ADLs) as movement, going up and down stairs, changing and holding posture, bathing, toileting, and dressing, grooming and eating. The self-care tasks or basic ADLs are considered essential to independent living (American Geriatrics Society; 2002). In general, having limitation to perform at least one ADL indicates health care needs.

Disability is also defined as any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being (ICIDH -2, WHO, 2001). This concept has been framed originally by Nagi (1976; 1991),

who defines disability as limitation in performance of socially defined roles and tasks within a socio-cultural and physical environment.

In this study, population with disability is comprised by the individuals that report in the SABE Survey having difficulties with at least one of the following daily life activities: walking, dressing, bathing, eating, getting in/out of bed and toileting.

2. Characteristics correlated to disability

Older age, work status, female, low social contact, depressive symptoms, poor life satisfaction, and poor self-rated health are commonly associated to disability (Lee and Shinkai, 2003). There has been found that co-occurrence of common impairments as motor and cognitive impairments, and co-morbidity including hip fracture, vision or hearing loss and depressive symptoms further exacerbate the effects of other impairments on disability (Kempen *et al*., 1998; Braithwaite and Wong, 2003; Tidermark J.2003).

In this study, prevalence of disability is presented firstly, according to health indexes and then to selected socio-demographic characteristics, number of chronic conditions and living arrangements

Health and disability

It is generally accepted that health self report (HSR) is a reliable indicator of the actual health status, either at individual or aggregated level. Figure 1 (a) shows the association between HSR and number of ADL limitations in the four cities [3].

In addition, the survey also shows evidence of the association between number of number of chronic conditions and ADL limitation prevalence. ADL limitation has multiple causes, and its association with chronic conditions and depression, as said, has been frequently found (Lee and Shinkai, 2003). Many people with chronic illnesses also have activity limitations inclusive in developed settings (Partnership for Solutions, 2002), corresponding to the elderly highest prevalence of disabling conditions (National Academy on an Aging Society, 1999). Presence of these conditions, however, is by no means synonymous of ADL limitation, particularly when the elderly person has access to adequate health care. Elderly people, very often have at least one chronic condition; hypertension, diabetes and arthritis were the most common ones reported in these surveys. Figure 1(b) shows that, in general, those with no ADL limitations have on average, less than 1,5 chronic diseases. However those having at

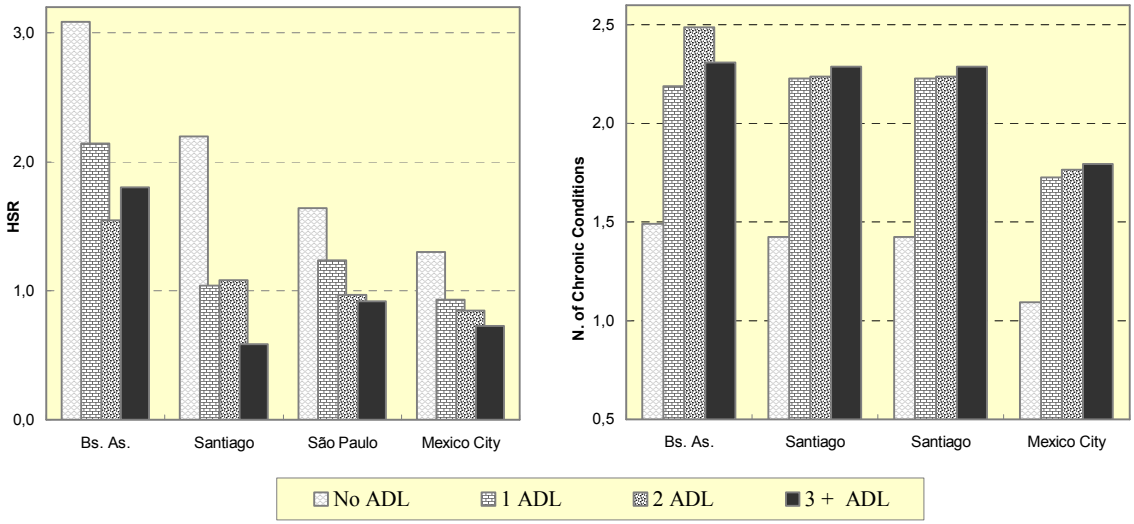
[3] HSR was evaluated in the SABE Survey, through five categories, then, for analytical purposes answers are punctuated as follows:

0.0 = Bad Health	3.0 = Very Good
1.0 = Fair	4.0 = Excellent
2.0 = Good	

least 1 ADL limitation, report, on average, more than two chronic diseases. The only exception is Mexico City, where, in any case, the pattern of more chronic condition among those wit hat least one ADL is clear.

Figure 1: Population aged 60 or more according number of Activities of Daily Life limitations (ADL) and Health Self Report (HSR) and number of chronic conditions - Selected cities of Latin America (2000)

a) According to Health Self Report (HSR) *b) According to number of chronic conditions*



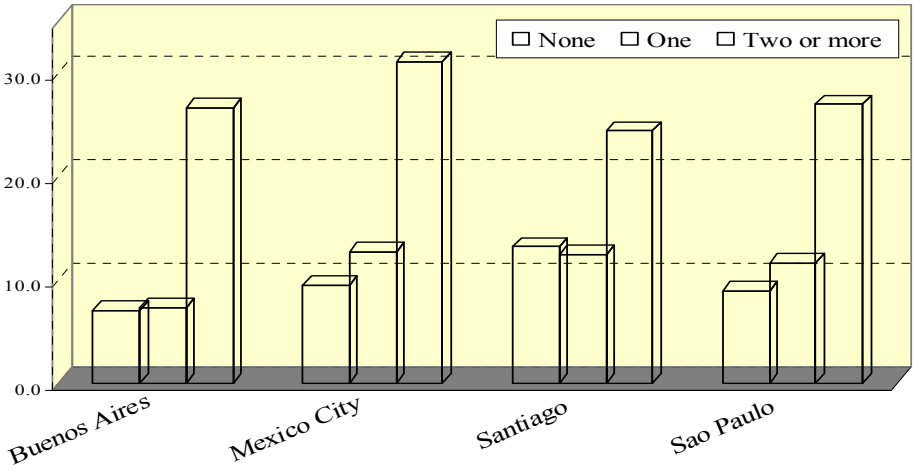
Source: PAHO – SABE Survey/2000

In addition, multiple health conditions as a clear indication of higher risk of functional limitation are confirmed by the results of the SABE Survey in these four cities. Figure 2 shows the increment in the proportion ADL-dependents according to the number of chronic conditions[4]. While prevalence of disability is near 20%, the proportion among those with no chronic conditions or just one is well below this value: it is 10% on average and without meaningful differences whether the elderly has none or one chronic condition.

Oppositely, when the elderly person has two or more chronic conditions, there is a dramatic increase in the prevalence of ADL limitations: in all cities the proportion is near 25% and Mexico City presents the highest value (above 30%). Furthermore, in the case of Buenos Aires, disability among those with two or more chronic conditions is nearly four-fold the average prevalence of those with none or just one chronic condition.

[4] Chronic conditions included here are: Hypertension, diabetes, cancer, lung deceases, cardiovascular deceases, and stroke. Depressive symptoms are also included.

Figure 2 Buenos Aires, Mexico City, Santiago and Sao Paulo (2000) : Population aged 60 or more that have ADL limitations according number of chronic conditions (%)



Source: SABE-2000/PAHO

In short, ADL limitations portray the health status and health care needs in a given population which is particularly true among the elderly population.

- Disability and socio-demographic characteristics

Prevalence of disability according socio-demographic characteristics is shown in Table 1; first panel shows the general prevalence among elderly people having at least one ADL limitation in each city according to age, marital status, living arrangements and education by sex.

In general, nearly 20% of the elderly people have at least one ADL limitation. Considering gender, prevalence of disability is about 50% higher among women than men; disability, as said before is more age-related than gender: there are nearly two ADL-dependents at age 70 or more for each elderly of younger age, being the difference more accentuated among men. Presence of disability is above 25% in the four cities for the age group 70 or more. Similar levels of prevalence are commonly found in other settings[5].

Considering both sexes, increase of ADL limitations appears to be extremely associated with aging in Santiago de Chile.

According to marital status, ADL dependency is more frequent among non married elderly persons; this relation is clearer among women, consistently with the association with age and mortality since women tend to live longer than men, which motivates higher proportions of widow females. Prevalence of ADL limitation among non married women may be nearly

[5] Percentage of Hispanic adults aged 65-74 with limitation in functional activities living in the United States for the early nineties was estimated as 27.8. (Campbell *et al*., 1999)

twice the prevalence among married women as is the case in Buenos Aires and Santiago de Chile. Non-married status, should be reminded, it is not equivalent to uni–personal households.

Table 1.
Population aged 60 or more that have at least one disability according selected characteristics
Selected cities of the Americas (2000)

Selected characteristics		Bs. Aires	Mexico City	Santiago	Sao Paulo
Both sexes		**17.4**	**19.4**	**19.1**	**19.3**
Age	60- 69	10.9	13.0	11.5	14.5
	70 or more	23.1	27.8	28.0	26.1
Marital Status	Married	12.3	16.0	14.0	17.1
	Non married	23.6	23.7	25.7	22.2
Living Arrangement	Alone	22.1	17.1	17.3	20.0
	Nuclear	12.1	12.5	16.6	15.9
	Extended	22.7	25.1	19.8	22.7
Years of Education	Less than three	27.9	26.5	29.1	24.2
	Three to seven	23.3	17.2	20.4	17.6
	More than seven	12.2	9.9	11.1	9.9
Male		**12.8**	**14.1**	**14.8**	**14.8**
Age	60- 69	7.6	10.0	9.6	10.8
	70 or more	17.8	25.4	19.9	21.4
Marital Status	Married	11.6	15.2	13.8	14.9
	Non married	16.4	19.2	14.2	14.5
Living Arrangement	Alone	15.6	13.5	3.9	16.4
	Nuclear	11.3	9.7	13.4	14.2
	Extended	14.8	23.5	15.3	15.5
Years of Education	Less than three	12.3	25.9	22.9	19.0
	Three to seven	19.3	13.1	14.9	14.7
	More than seven	10.2	8.0	8.0	6.1
Female		**20.2**	**22.4**	**22.7**	**22.4**
Age	60- 69	13.0	15.5	13.1	17.4
	70 or more	26.3	29.4	32.5	29.0
Marital Status	Married	13.0	17.1	14.2	20.0
	Non married	25.7	25.0	28.8	24.1
Living Arrangement	Alone	24.5	18.8	22.7	21.2
	Nuclear	12.7	15.8	19.9	17.7
	Extended	26.3	26.0	23.8	26.8
Years of Education	Less than three	34.8	26.9	32.4	27.2
	Three to seven	25.3	26.1	24.3	19.7
	More than seven	13.8	11.7	13.4	14.3

Source PAHO – SABE Survey/2000

Although it is a frequent phenomenon (nearly 20% of ADL dependents live alone), there is higher prevalence of disabilities among elderly persons living in extended families (23%), which, is due primarily to living arrangements of elderly disable women.

Finally, ADL limitation seems to be a socio-economic function as the number of years of education, as a proxy of the socio-economic status indicates. Indeed, comparatively to age and sex, the strongest inverse association corresponds to education: the less the years of

schooling, the higher the prevalence of ADL limitations. The average ratio of disabilities for the less educated to the more educated is 2.6. This ratio is higher among males, being the extreme cases Mexico City and Sao Paulo: in these cities, prevalence of at least one ADL limitation among less educated elderly people is more than threefold the corresponding proportion among the more educated elderly people. Is it worth to note in addition that these two cities besides having notorious socio-economic inequalities, hold the poorest educational status, where average of schooling years is 3.4 and 4.7 respectively[6].

- Assistance to the ADL dependent

The functional impairment would force assistance to the elderly person on a daily basis in order to maintain a minimum quality of life. Table 2 refers to the total elderly people with at least one ADL limitation according to several aspects of help in order to portray approximately the quantity and quality of assistance that they receive; it includes money, foods and other goods and services like transportation, housework, clothing, etc.

Firstly, there are important proportions of disable population reporting not receiving assistance. In these set of cities about a third of the elderly people with at least one ADL limitation reports not receiving care/help at all. The highest proportion corresponds to Buenos Aires (40.6%).

Amount of people receiving help varies according living arrangements. Although random variations regarding the sample size need to be considered, Table 2 indicates, in general, that elderly people living alone tend to receive scarcer assistance than those living accompanied. In Buenos Aires and Mexico City, the proportion is almost twice the value of those sharing a household.

Also, very often the assistance is received on a non-daily basis. In Buenos Aires and Mexico City, among those living alone and with at least one disability, only one or two out of ten receive help in a daily basis. In Santiago and Sao Paulo, the equivalent ratio is higher (about 30%).

The care-taker in most of the cases is a close relative for those who live accompanied: partner, child and child in law. We include the latter category since they are important components in Latin American extended families (Ramos, 1994; Saad, 1996) and similarities between biological children and children in law have been found in relation to care-giving to the elderly in extended families (Peter-Davis, Moss and Pruchno, 1999). Among those living alone, with the exception of Buenos Aires in about two thirds of the cases, the care-taker is other than a close relative.

[6] In Buenos Aires and Santiago, this average is above 6.0

Table 2.

Buenos Aires, Mexico City, Santiago and Sao Paulo (2000): Population 60 or more having at least one ADL limitation that receive some care/help, according to frequency of care/help and relation and residence of the care-taker

City	Report Receiving care				Relationship		Residence	
	Total	Frequency of care			Partner/ child /child-n law	Other	Same house or nearby	Outside the neighborhood
		W/O help/care	Daily	Non-daily				
Total of population with at least 1 ADL limitation								
Bs. Aires	100.0	40.6	41.7	17.7	49.9	50.1	80.6	19.4
Mexico City	100.0	29.1	46.3	24.6	60.1	39.9	86.2	13.8
Santiago	100.0	16.1	57.9	26.0	62.0	38.0	90.5	9.5
Sao Paulo	100.0	27.3	57.5	15.2	62.7	37.3	85.4	14.6
Living Alone								
Bs. Aires	100.0	64.6	13.4	22.0	12.9	87.1	47.9	52.1
Mexico City	100.0	51.7	17.0	31.3	43.4	56.6	62.3	37.7
Santiago	100.0	22.1	29.4	48.5	34.3	65.7	76.2	23.8
Sao Paulo	100.0	36.9	37.7	25.4	41.3	58.7	62.8	37.2
Living Accompanied								
Bs. Aires	100.0	32.7	51.0	16.3	56.4	43.6	86.4	13.6
Mexico City	100.0	27.1	49.0	23.9	61.1	38.9	87.6	12.4
Santiago	100.0	15.6	60.4	24.0	64.2	35.8	91.7	8.3
Sao Paulo	100.0	25.9	60.5	13.6	65.5	34.5	88.3	11.7

Source PAHO – SABE Survey/2000

In addition, although major part of the care-takers share the same household or live nearby which is clearer when the ADL dependant lives accompanied, an important proportion of them lives outside of the elder's home neighborhood (around 10% on average). In the case of those living alone, the care–taker very often lives outside of the elder's neighborhood, being the extreme situation in Bs. Aires, where half of the caretakers do not live near the elderly's household.

Summarizing, the general description of prevalence of ADL limitation above indicates that among the set of characteristics considered, there is clear association regarding age, education, chronic conditions, and living arrangements. The correlation coefficients presented in Table 3, considering number of ADL limitations, instead of having just one of them, show that association with these variables are significant in most of the cases.

Table 3

Buenos Aires, Mexico City, Santiago and Sao Paulo (2000): Pairwise correlation of Self rate health and selected characteristics of the elderly population

Pairwise correlation of ADL limitation and :		Bs. Aires	Mexico City	Santiago	Sao Paulo
Both sexes	Age	0.2494*	0.2654*	0.2754*	0.1982*
	Years of education	-0.1585*	-0.1522*	-0.1582*	-0.1181*
	Socio-Economic Status	-0.0966*	-0.0977*	-0.1076	-0.0930*
	N. of chronic conditions	0.2499*	0.2357*	0.2605*	0.2375*
	Frequency of care	0.4872*	0.5110*	0.6431*	0.4836*
	Living arrangements	0.0613*	0.0194	0.0144	-0.0073
	Care taker	0.4423*	0.5003*	0.6261*	0.4316*
	Marital Status	0.0892*	0.0695*	0.0509	0.0658*
Male	Age	0.1463*	0.2614*	0.1123*	0.1852*
	Years of education	-0.0959	-0.1725*	-0.1410*	-0.1222*
	Socio-Economic Status	-0.0750*	-0.1713*	-0.1316*	-0.1349*
	N. of chronic conditions	0.1720*	0.2274*	0.2053*	0.2486*
	Frequency of care	0.4740*	0.5910*	0.6248*	0.5878*
	Living arrangements	-0.0342	0.0197	0.0746	-0.0127
	Care taker	0.4054*	0.5962*	0.6150*	0.5447*
	Marital Status	-0.0007	0.0018	-0.0763	0.0273
Female	Age	0.2938*	0.2609*	0.3451*	0.1996*
	Years of education	-0.1775*	-0.1247*	-0.1550*	-0.1002*
	Socio-Economic Status	-0.0957*	0.0449	-0.0960*	-0.0625*
	N. of chronic conditions	0.2747*	0.2268*	0.2593*	0.2143*
	Frequency of care	0.4841*	0.4687*	0.6434*	0.4181*
	Living arrangements	0.0936*	0.0723*	0.0509*	0.0053
	Care taker	0.4471*	0.4416*	0.6244*	0.3598*
	Marital Status	0.1051*	0.0786*	0.0811*	0.0448

* Significant with p-value > 0.05%

Source PAHO – SABE Survey/2000

The highest coefficients corresponding to frequency of care given to the elderly and presence of caretaker in the first place and number of chronic conditions and age in the second place. Education shows a clearer association than socio economic status (SES), furthermore, among women, coefficients for the latter are always lower than for education[7].

Regarding sex, an important difference is that marital status and living arrangements are significantly associated to ADL limitations, among women only, being the one exception, Sao Paulo where this variable shows no significance at all.

[7] Socio-economic Status was defined using criteria by ABA/ABIPEME (1984) and Mattar (1997).

Discussion and preliminary remarks

Results indicate that there are more similarities than differences among the four cities in terms of disability. In general we can expect that around 20% of the elderly people would report at least one ADL limitation. Considering that disability is inversely related to educational levels and that results corresponds to urban settings where very often education have higher levels than the rest of the country, a conservative estimate can be done for Latin America and the Caribbean. Using the above prevalence, extrapolation for the total population would imply 9.7 million people aged 60 years or more in 2005, in need of social services and medical care in order to perform ADLs satisfactorily. Ceteris Paribus, this demand will increase on average nearly 3% per annum thus, by 2025 the equivalent figure would be at least 20 million elderly people having at least one ADL.

Among vulnerable population, less educated and or with low SES, regardless of the total prevalence of ADL limitation in these four cities, 30% of the vulnerable population would report at least one ADL limitation. This result also indicates that prevalence of disability is affected mostly by the social environment; individual socio-economic differences do not appear to affect the probability of reporting ADL limitations.

In Latin America, where, public health care is deficient, one of the basic measures to alleviate the foreseen burden that the aging process will bring about might be to improve education of the total population in general and of the elderly in particular. Primary education may cover involvement of families, communities or institutional programs providing people with the tools to address major social issues and health preventive behaviors. SABE data has shown that multiple chronic conditions are closely associated to ADL limitations and it is known that we can delay onset of such diseases through preventing behavior (WHO, 2004; CDC, 2004).

A major issue concerning functional decline is that permanent caregiving, demanded by the disable elderly population, may not be provided by the public service in the near future in most of the Latin American countries. Thus programs to support informal care will be essential. SABE results have shown some negative and positive perspectives in this respect.

Firstly, there is an important fraction of the elderly population with ADL limitations (about half of them) that do not receive help on a daily basis. The figure increases among those living alone, being the most impressive cases Buenos Aires and Mexico City. Lack of assistance might be mediated by the individual's socio-economic conditions, thus auto–sufficiency to afford domestic conveniences to offset troubles caused with disabilities might explain absence of help. This might apply to Buenos Aires, which is a city with relatively high life standards, but could be an insufficient explanation to the rest of the cities. This aspect deserves further attention.

In addition, although elderly people living alone constitute about 10-15% of the total elderly population in the SABE Survey, it is also among elderly living alone that help is given by others than non-close relatives. This situation that is almost general in Buenos Aires might be associated to the actual lack of close relatives available to look after the elderly person. If this is the case and it is related to the demographic changes ongoing in Latin America in general, we may expect this pattern to be generalized very soon throughout the continent. On the other side, however, as more than half of all the elderly population with disabilities receives assistance from close relatives or live in extended families, we can also expect that cultural patterns favoring familial networks can outpace demographic changes and thus creating conditions to strength informal caregiving. Studies by Dilworth-Anderson et al., (1999) and Hopp (1999), for example, suggest that this is the case for black families that give support to their disable elderly members. If Latin American family ties culture is stronger enough to survive demographic changes, police maker could count on them as important resource for implementation of informal care for the disable elderly. Considering that more than 80% of the caregivers live in the same house or nearby the elderly persons, it seems that the network is already installed. This is another issue to address.

Finally, gender is also a fundamental issue to consider. Due to the higher female survivorship and being disability an age-related phenomenon, vulnerable individuals with disability will be mostly women with higher chances of carrying at least one ADL. It is highly probably that informal care will be given to her. Research to evaluate this type of informal care is also needed.

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