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The socio-economic determinants of older people's health in Brazil: the importance of marital status and income

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ABSTRACT
Studies in various countries have reported that older people who are married have better health than older widows. This paper reports a replication of these analyses with Brazilian data. The main objective was to explore the relationships between marital status, individual and household income, and the health of men and women using ordered logistic regression with self-assessed health as the dependent variable. The explanatory variables of interest were gender, marital status, and individual and family income. The data are from a survey of 7,920 non-institutionalised older people resident in the southern state of Rio Grande do Sul in 1995. The survey used a structured, multi-disciplinary questionnaire, which collected information on demographic attributes, household composition, social relations, occupation, income and health status. The results show that widows were 20 per cent more likely to report better health than married women. The women without individual income had worse health than those who did, even after controlling for family income. For men, there were no significant differences in health by marital status. The main recommendation is that the health status and economic circumstances of married elderly women should be given more attention in both research and policy, certainly in Brazil and probably in other Latin American countries. Programmes of income support to the poorest households should include specific transfers to these elderly women. Brazil's Family Health and Older People's Health public programmes should place more emphasis on the health of elderly home-makers.

KEY WORDS – older people, marital status, health, income, Brazil.

Introduction

An elderly person faces the social and health challenges of their age, with a raised incidence of co-morbidity, cognitive impairment and bereavement,

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a higher likelihood of difficulties in performing the activities of daily living, and the existential challenges that come with proximity to the end of life. Various factors that have a cumulative impact on health are more likely with increasing age to generate undesirable health outcomes, from unhealthy behaviour, such as smoking and alcohol abuse, through the physical demands and stress of paid employment, to exposure to environmental pathogens and pollutants. In Brazil, as in other Latin American countries, these universal concerns are lived in a society that is unprepared for a large elderly population, being characterised both by low incomes and inadequate public health-care, in both its quantity and the orientation towards older people.

Although the Brazilian public health-care system provides universal access and treatment that is free at the point of delivery, the system has well known deficiencies, especially in its low resources. The public share of total health-care spending is lower than in other Latin American countries, and the private share is higher (including out-of-pocket payments and insurance premiums) (Pan American Health Organisation 2002). In these circumstances, older people's low incomes and savings strongly constrain their access to private health-care (Bós and Bós 2004*b*; Ramos *et al.* 1993; Romero 2002; Lima-Costa *et al.* 2003). Private providers are viewed as offering better quality services but are expensive (Farias 2001; Gouvêas, Travassos and Fernandes 1997). Bós (2005) observed that older people who use private providers have better health than those who rely on the public system. The most obvious indicator of an individual's financial resource is his or her personal income, but this measure has limitations. The financial resources of other household members may or may not be used to access health care for an older person. This is a particularly relevant consideration in Brazil because few older people live alone (16 % in our sample), or only with a spouse (23 %), and most (53 %) live in multi-generational households. To understand the relationship between marital status and health, it is therefore important to assess the financial resources of not only the individual but also the household.

For many senior citizens, their income largely depends on their receipt of social security benefits. Beltrão, Pinheiro and Oliveira (2002) reported that reforms in the Brazilian social security system during the late 1980s and early 1990s, especially the increased value of old-age benefits and the reduction of the eligibility age, raised the number of pensioners. The improvements in coverage and benefits have changed the economic resources of the family. Whereas in 1988 older people contributed 10 per cent of urban household income, by 1998 the percentage had increased to 16. The presence of elderly members in a household (or family) is associated with greater income, and the effect is particularly strong among

poorer households (Barros, Mendonça and Santos 1999). The new social security system has also changed the allocation of income to individuals, especially elderly women. From an analysis of census data for both rural and urban areas, Camarano (2003) reported that the percentage of elderly women who received an income increased substantially from 1980 to 2000, from 58 to 82 per cent.

There are two main reasons why individual income might have a strong impact on older people's health. One expects that a person has more control over his or her individual or personal income than over the income of other household members (Pezzin and Schone 1997). A person would be more likely to use their own than others' resources to finance their health care. Furthermore, contributing financially to the household should enhance the individual's bargaining position for overall household resources (Tiefenthaler 1999). This leverage might be used to direct more of the household's income towards the individual's health care. If these two expectations are correct, the typical home-maker without a personal income is in double jeopardy: they have no resources of their own to use for health care, and they have little leverage on the household's resources.

The marital status of an older person has important implications for their health, even after controlling for household income and other demographic and social factors. Most studies in both developed (Krause *et al.* 1995; Mookherjee 1997; Nilsson *et al.* 2005; Roos and Havens 1991; Schoenborn 2004) and developing countries (Mostafa and Van Ginneken 2000; Rahman 1999; Zimmer and Amornsirisomboon 2001; Krause *et al.* 1995) have suggested that married elderly people have better health than those of other marital status groups, and that this applies to both sexes. The differential might however be specific to a country's social security and public health systems. Studies that have not found marriage to be beneficial for one or both sexes have included those by Noale *et al.* (2005) in five European countries and Israel, by Nagata, Takatsuka and Shimizu (2003) in Japan, and by Pizzetti, Manfredini and Lucchetti (2005) in Parma, Italy.

The financial benefits of being married include the higher income from two individuals (Pearlin and Johnson 1977; Wyke and Ford 1992; Smith and Zick 1996). Upon widowhood, the survivor loses the spouse's income, for which pension and other survivors' benefits might not sufficiently compensate. The impact of this transition depends on the specifics of a country's pensions and bereavement-benefit policies. Another benefit of marriage is the direct and intimate emotional support from one spouse to another, which of course is lost on widowhood (Wyke and Ford 1992). But being married can also be a source of stress, abuse and even violence. Widows might gather social support from outside the household, as a

supplement or substitute for spouse support, as from current or previous co-workers, neighbours and friends, and from members of church and other civic or informal groups (Fuhrer and Stansfeld 2002; Koukouli, Vlachonikolis and Philalithis 2002; Michael *et al.* 2001; Nocon and Pearson 2000). Good social support reduces reliance on the benefits of marriage. Finally, widowhood implies a period of bereavement, which might affect health, although usually temporarily (Anderson and Dimond 1995; de Leon *et al.* 1994; Lee *et al.* 2001; Lindeboom, Portrait and van den Berg 2002). Married women's health may be worse than that of single or widowed women because the time and emotional commitments to married life negatively affect their health (Artazcoz, Borrell and Benach 2001; Burton *et al.* 2003; Pizzetti, Manfredini and Lucchetti 2005; Satariano, Minkler and Langhauser 1984; Wallhagen *et al.* 2004).

This discussion has considered the role of marriage in protecting health, but there is an alternative hypothesis, that healthier individuals are more likely to marry and to stay married – the marriage selection effect (Wyke and Ford 1992; Goldman 1993; Waldron, Hughes and Brooks 1996). This hypothesis also implies that married older people have better health than those who are widowed, single and divorced. The data used in this study do not allow for a specific consideration of this effect, although some of the results provide relevant understanding. This aim of the paper is to contribute to the understanding of the social determinants of older people's health, with special emphasis on the influences of marital status and income. Besides reporting evidence from Brazil, the main objective is to explore the relationships between these determinants and their impact on health.

Methods

Data source

We used publicly-available data from the southernmost state of Brazil, Rio Grande do Sul, which has 10.2 million inhabitants, of whom 10.5 per cent are aged 60 or more years (Instituto Brasileiro de Geografia e Estatística 2000*a*). In 1995, the Conselho Estadual do Idoso (1997) [State Committee for Older People] carried out in co-operation with 14 universities a 'Multidimensional Study of the Conditions of Life of Older People'. The target population of this cross-sectional survey was men and women aged 60 or more years living in non-institutional homes in urban areas. The sampling process was rigorous and effective: the large representative data set is the main strength of this report. The sample was made representative of several strata, namely the populations of the nine regions of the State,

and of the population sizes and main socio-economic groups in the cities of each region. This was achieved by random selection without replacement of the cities in each region, by random selection of census sectors (or tracts) in each selected city, and finally by random selection of the eligible citizens in each census sector. The target was 880 older people in each of the nine regions, to produce a total State sample of 7,920. Data collection was performed using a structured, multi-disciplinary questionnaire, with information on demographic attributes, household composition, social relations, occupation, income, and health status.[1]

Rio Grande do Sul has advanced along the age-structure transition, which follows a substantial decline in fertility, a little more than the rest of the country. As noted, 10.5 per cent of the State population is aged 60 or more years, whereas the figure for Brazil is 8.9 per cent. One of the most important demographic differences between Rio Grande do Sul and the country is the racial composition, the State being less diverse. In fact, 87 per cent of the population self-classifies as white, whereas the corresponding figure for the country is only 54 per cent (Instituto Brasileiro de Geographia e Estatística 2000*a*). Nonetheless, in other respects it is expected that the State is broadly representative of Brazil. Rio Grande do Sul shares with the rest of the country the main features of the Brazilian national health system (Sistema Único de Saúde), the *National Plan of Elderly Health* and the various benefits provided by the Social Security programme. No significant cultural differences between the state and the country are apparent – such as in the distinct caring roles of husbands and wives. Where data were available, the results from the Rio Grande do Sul sample have been compared with other areas of the country.

Self-assessed health

The dependent variable of interest was self-assessed health, which was elicited by the question, *Em geral diria que sua saúde é*? [In general, how would you say your health is?]. According to data from the Conselho Estadual do Idoso (1997), men reported better self-rated health than women (Table 1). These figures are very similar to those reported by the Instituto Brasileiro de Geografia e Estatística (2000*b*) for the country as a whole. Self-assessed health has a high degree of external validity, and many studies have shown that it provides a good summary of overall health status (Jylha *et al.* 1998; Liang 1986), and is well correlated with mental health (Davies and Ware 1981), morbidity (Molarius and Janson 2002) and functional status (Hoeymans *et al.* 1997; Kaplan *et al.* 1993). On the other hand, Amber and Cooper (1999) found little correlation between subjective health and functional impairment. Self-reported health is also a

TABLE 1. *Self-assessed health by gender: people aged 60 or more years, Rio Grande do Sul, Brazil, 1995*

Health assessment	Women	Men	Both sexes
		Percentages	
Very poor	8.8	4.9	7.5
Poor	7.0	5.6	6.6
Fair	51.7	46.4	49.9
Good	24.6	31.4	26.9
Excellent	7.9	11.7	9.3
Sample sizes	5,184	2,599	7,783

good and independent predictor of mortality (Mete 2005; Idler 1992; Idler, Kasl and Lemke 1990; Idler and Benyamini 1997; Benyamini and Idler 1999), health-care use (Miilunpalo *et al.* 1997) and early retirement (Karpansalo *et al.* 2004). Mackenbach *et al.* (2002) concluded that self-assessed health is an inclusive measure of health, in that it reflects aspects relevant to survival that other health indicators do not cover. Based on data from six different Latin American countries, Palloni, Wong and Peláez (2005) concluded that self-assessed health captured multiple facets of the health of older adults, such as chronic diseases, levels of satisfaction with their nutrition, life and memory, and problems with functioning.

The subjective evaluation of one's own health status applies a broader view of 'good health' than the absence of disease and disability or any other objective biomedical measure (Bryant, Corbett and Kutner 2001; Simon *et al.* 2000), and expresses a holistic perspective on the overall state of wellbeing (Barsky, Cleary and Klerman 1992). As a single measure of a very complex phenomenon, it does however have limitations. This single global item might not be a good substitute for a multi-item assessment (Barofsky, Erickson and Eberhardt 2004), and there is also concern about its reliability (Crossley and Kennedy 2002). Kerkhofs and Lindeboom (1995) argued that responses to a self-assessed health question may be biased by financial incentives and social norms. One example is when social insurance benefits are linked to disability for retirement, on the grounds that poor health is socially more acceptable than, say, to have more leisure. In Van Doorslaer and Gerdtham's (2003) study, however, there was no systematic adjustment of self-assessed health by income, and they concluded that any income-related variation in self-assessed health is unlikely to be biased by reporting error. The power of self-assessed health to predict mortality does not appear to vary systematically by income (Burstrom and Fredlund 2001).

We estimated the reliability and validity of the self-assessed health variable using other health indicators from the survey. Only the main

results of these analyses are presented here.[2] A morbidity score was based on the number of 16 specific health conditions that had received treatment over the previous six months. The results show that self-assessed health was closely related to morbidity. Persons with better subjective health reported fewer health problems, while those with worse subjective health reported more problems. Specifically, the average number of health problems was 5.4 for those with 'very bad health', 5.0 for those with 'bad health', 3.7 for those with 'fair health', 2.1 for those with 'good health', and 1.4 for those with 'excellent health'. Another test showed that self-assessed health was closely related to the ADL score. People with better subjective health reported fewer ADL help needs, while those with worse self-rated health reported a need for more assistance. For instance, 80 per cent of those with 'excellent health' but only 35 per cent of those with 'very bad health' reported no need for assistance. The financial bias suggested by Kerkhofs and Lindeboom (1995) was not important in the study sample, for only 11 per cent had retired for health reasons. In these cases, moreover, giving a health reason for retirement did not associate with current health as measured by either self-assessed health or by the number of chronic conditions receiving treatment.

Marital status

We were particularly interested in how marital status related to health. The vast majority (90 %) of the sample were either married or widowed, and we therefore concentrated on the comparison between these two groups. Among women in the sample, 56 per cent were widowed and 32 per cent were married; while among the men, 71 per cent were married and 18 per cent were widowers. Only 4.6 per cent of the men and 7.5 per cent of the women were single (never married), and only six per cent of the men and 4.5 per cent of the women were divorced (and had not remarried). These findings are very similar to Camarano's (2003) for the country as a whole from the 2000 census.

Financial resources

Table 2 presents both the average household income in units of the number of minimum wages (100 *Reais* in 1995; *Real* is the Brazilian currency) and the average household size by marital status. Although the differences are not large, married older people had higher household income than the other marital status groups, but the differential was 'compensated' for by the larger households. The average *per capita* household income (household income divided by household size) was identical for married people and widows (1.4 minimum wages). These

TABLE 2. *Average family income and household size by marital status*

Marital status	Average family income in minimum wages[1]			Average household size (persons)
	Female	Male	Both sexes	
Single	3.3	2.7	3.2	2.6
Married	4.3	4.7	4.5	3.1
Widowed	4.0	3.5	3.8	2.7
Divorced	3.3	3.5	3.4	2.4
Total	4.0	4.3	4.1	2.8

Note: 1. Expressed as number of minimum wages (100 *reais*) per month.

figures show that high household income in Brazil is not related to being married and, inversely, low household income is not an outcome of widowhood. Strictly speaking, the *per capita* figures are not reliable indicators of financial well-being, since they overlook the economies of scale that benefit bigger households – two persons living together usually have a lower cost of living per head than two persons living independently because they share the residence and household goods. Given this problem, we entered total household income rather than the *per capita* figures into the regressions and used household size as an additional control variable.

As a previous study (Bós and Bós 2004*b*) had found that an individual's health-care use has a clearer relationship with their personal income than their household resources, the survey established each respondent's individual income. Two indicators are particularly important: whether a person has any individual income, and for those who do, its value. About 15 per cent of women and two per cent of men had no individual income. For these respondents, the household provided financial support, which may or may not have made them vulnerable. Among those who had personal income, the average amount for women was 2.4 minimum wages, which was 30 per cent lower than men's. Overall, women had a lower level of financial resources at their discretion, which leads to the expectation of worse health.

Since married women were more likely to be home-makers, we expected them to be less likely to have an individual source of income than widows. The survey data confirmed this expectation. Whereas most widows (97 %) had some income, more than one-third (37 %) of the married women had none. As many married women had to rely on the income of their husbands, and among those living in multi-generational households of other household members, it was expected that married women would on average have poor health. On the other hand, there were no important differences in average individual income by marital status. For widows, the average income was 2.5 minimum wages, and

for married women it was 2.2. One may conclude that when comparing elderly women by marital status, the main issue is whether she had individual income, not its level.

Control variables

The control variables were age (in years), race, education, and two measures of lifetime paid occupations. A previous study (Sickles and Taubman 1997) had shown that these variables might influence health in old age, although they are not the focus of the present analysis. Self-classified race was also entered as a binary variable (1 = nonwhite, 0 = white). It was expected that health deteriorates with age and that the relationship between race and health would reflect, among other factors, the accessibility of neighbourhood health-care facilities and racial discrimination by health-care providers. Indirect evidence of these relationships was found by Bós (2005) and they have been analysed by Travassos and Williams (2004). Education was measured by the highest level of schooling achieved and had four categories: no formal education (including illiterates), primary education (up to four years of schooling), secondary education (5–12 years schooling), and college education (more than 12 years education). It was expected that better-educated older people would have better health, as they would make more informed decisions about both health-related behaviour and health care (Chaieb and Castellarin 1998; Moreira *et al.* 1995).

The two occupational variables represent distinctive features of the occupational experience of older Brazilians in the present cohort; namely the economic sector and occupation in which they had spent most of their working life. These measures were chosen as being most relevant to long-term health. For the economic sector the base category was agriculture – with the alternative being the other sectors, industry and services. The category for occupation was non-specialised occupations (construction labourer, garbage collector, cleaning, unskilled assistants in retail and office, maids, fishermen, longshoremen, street peddlers, office boys and watchmen) – with the alternative being all other (semi-specialised and specialised) occupations. It was expected that being employed for many years in non-specialised occupations would have a deleterious effect on health in old age (Fuchs 2004; Costa 2000).

There were strong relationships among income, race, education, economic sector and occupation, the measures that identify the socio-economic and occupational status of an individual. We chose to focus on income, especially the distinction between household and individual income. Interactions between the controls and the variables of interest were studied.

TABLE 3. *Socio-economic profiles of men and women in the sample*

Attribute	Category	Men	Women	Both sexes
			Percentages	
Age group (years):	60–69	60.1	55.2	56.9
	70–79	31.7	33.8	33.1
	80 and older	8.2	11.0	10.0
Race:	White	83.6	85.4	84.8
	Non-white	16.4	14.6	15.2
Education:	None or non-formal	25.4	28.9	27.7
	Primary	57.4	57.9	57.7
	Secondary	13.6	11.3	12.1
	College	3.7	1.9	2.5
Economic sector:	Agriculture	33.8	20.2	24.7
	Other	66.2	79.8	75.3
Occupation:	Not specialised	45.8	35.4	38.8
	Other	54.2	64.6	61.2
Sample size		2,599	5,184	7,783

Since the sensitivity analyses did not suggest any important changes in the main results, they are not presented in this paper (but are available from the authors upon request). Table 3 presents the relevant profiles using data from the Conselho Estadual do Idoso (1997) report on the circumstances of older people in Rio Grande do Sul.

Regression analysis

The self-assessed health indicator asked the respondents to rate their health using one of five categories, ranging from 'very poor' to 'excellent'. Given that the variable is ordinal, we used ordered logistic regression.[3] A complication of the ordered logistic model is the difficulty of interpreting the influence of the explanatory variables on the predicted probabilities for the intermediate categories 'poor', 'fair' and 'good', which might be ambiguous (Greene 2003). We chose to present the odds ratios for all categories, and each can similarly be interpreted as the odds ratio of a two-outcome logistic regression. In the present case, it provides a comparison of the chances of the outcome being equal to or higher than a specific category as a ratio of the chances of being lower. A full description of this interpretation is available in Long (1997). The ordered logistic models were run separately for the female and male respondents.

Thirteen per cent of the usable sample replied 'don't know' to the question on family income. This answer was more frequent among women, the widowed, the oldest and those who lived with their children. This suggests that if these cases were eliminated from the sample, the

TABLE 4. *Results of the ordered logistic regression for self-assessed health*

	Women		Men	
Variable	OR	SE (OR)	OR	SE (OR)
Marital status: single[1]	1.594***	0.177	1.112	0.196
Marital status: widow[1]	1.211***	0.084	1.099	0.112
Marital status: separated[1]	1.272*	0.172	1.244	0.199
Individual income (log)	1.018	0.017	1.253***	0.062
Family income (log)	1.278***	0.045	1.031	0.058
Age (years)	0.998	0.004	0.987	0.005
Race: nonwhite	1.009	0.078	1.199*	0.124
Education: primary[2]	1.434***	0.092	1.129	0.107
Education: secondary[2]	2.862***	0.288	1.729***	0.236
Education: college[2]	4.602***	0.883	1.877***	0.413
Economic sector: agriculture[3]	0.768***	0.053	0.826**	0.069
Occupation: non-specialized[4]	0.835***	0.050	0.822**	0.066
Household size	0.968*	0.178	0.973	0.253
Imputed	0.986	0.070	1.172	0.140
Likelihood ratio	396.33***		142.51***	

Notes: OR: odds ratios. SE (OR): standard error of the odds ratios. 1. Reference category: married. 2. Reference 2. Reference category: less than primary education (including illiterate). 3. Reference category: had not worked in agriculture. 4. Reference category: had not had non-specialised/low-skilled occupations.
Significance levels: * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

results would be seriously biased, so it was decided to impute the missing values using ordinary least-squares regression of the full set of demographic variables (as in Table 3), individual income and average city income.[4] The average city income was gathered from the 1991 national census (Instituto Brasileiro de Geographia e Estatística 1991). Logarithmic transformations of both individual and family income variables were entered in the regressions. The cases with zero income were given an imputed value of 1.0 *real*, which made their log transformation zero.

Results

The results of the ordered regression of the ordinal measure of self-assessed health show clearly the importance of marital status, income and gender (Table 4). Of particular relevance is the comparison between widows and the married respondents, the reference category. Among women, there was a significant difference in the self-assessed health of these two marital status groups, with widows having a 21 per cent higher chance of better health than married women, but no such difference was found for men. These results confirmed our expectation that married women would on average have worse health than widows.

TABLE 5. *Factors influencing women's health by possession of individual income*

	With individual income		Without individual income	
Variable	OR	SE (OR)	OR	SE (OR)
Marital status: single	1.634***	0.196	1.255	0.406
Marital status: widow	1.151*	0.086	1.500*	0.335
Marital status: separated	1.304*	0.190	1.063	0.398
Individual income	1.307***	0.081		
Family income	1.257***	0.063	1.204***	0.069
Sample size	4,391		793	

Notes: OR: odds ratio. SE (OR): standard error of the odds ratio.
Significance levels: * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

There was also a sharp gender difference in income. For women, family income was significant and very important in improving the health score (odds ratio 1.28, see Table 4), whereas individual income was not significant. For men, individual income was significant and very important (odds ratio 1.25), whereas family income was not significant. These results confirmed the expectation that individual income was an important factor in men's better subjective health than women's. On the other hand, they do not support our expectation that family income has a stronger impact on the health of men than of women. Individual income was not an important influence on women's subjective health. To check whether this finding resulted from so many women not having personal income, Table 5 compares the women with and without individual income. The models were fitted with the same control variables as before, but the results are reported for only the variables of interest.

The most important result in Table 5 is the large odds ratio for individual income. As the odds ratio for this variable was insignificant when all women were taken together (Table 4), it is shown that this is a function of 14 per cent of the women having no individual income. Given the high odds ratio, at a level similar to that for men (1.25), it was concluded that men and women relied equally on individual income to support their health-care needs. The odds ratio for family income was slightly higher (1.26) for those with individual income than for those without (1.20). This suggests that having individual income brought additional bargaining power over family resources, but because the difference between the two odds ratios was insignificant at the 95 per cent level, this additional bargaining power was not a powerful factor. The odds ratio for widows shows that they rated their health as better than did married women, the reference category. When the whole female sample was considered, the odds ratio was 1.20, but when the analysis was restricted to those with

individual income, the odds ratio was smaller (1.15). It follows that having an individual income partly explained the lower health status of married women. In other words, economic circumstances alone did not fully explain the difference between the marital groups.

Discussion

Our study has found that among older women in Rio Grande do Sul in 1995, married women had worse subjective health than those who were widowed or single and divorced, which is consistent with the findings from Rosa *et al.* (2003). This disparity is by no means found worldwide, and suggests that the worse health of married women may be a specifically Brazilian phenomenon or, given the cultural proximity, something that might also be found in other Latin American countries. As aptly reported by Romero (2002), family structure and social support are important influences on older people's health but the specific causal paths are not completely clear, especially in Brazil. Our results provide strong support for the hypothesis that having individual income is an important factor: certainly, women who do not have such income tend to have worse self-assessed health. The fact that a higher percentage (37) of married women than those in other marital status categories had no individual income partially explains why married women had worse health (*n.b.* only four per cent of widows had no individual income). The results do not fully explain why individual income had such an impact, although access to quality health care was probably important. The assumption, and strong possibility, is that older women rely more on their own financial resources than on household income to purchase good quality health care (Bós and Bós 2004*b*).

There were no differences between men and women in the relationship between individual income and self-rated health, which contradicts Brumer's (2002) opinion that Brazilian women rarely use their own money for personal expenses. Beyond its direct use, personal income enhances a person's decision-making capability by providing a stronger sense of control (Okojie 1994; Possatti and Dias 2002). Among older people, it may change their household economic role from being dependent to being a provider (Camarano 2003).

The importance of individual income should not be over-interpreted, for example by inferring that members of a household make entirely self-centred resource and expenditure decisions, because the level of household income was also significantly associated with older people's self-rated health (Beltrão, Pinheiro and Oliveira 2002; Barros, Mendonça and

Santos 1999; Camarano 2003). For those without individual income, household resources provide the basic source of financial support, and evidence from the present analysis shows that this support was forthcoming. There were no differences in this support by marital status. These results do not support the notion that, in Brazil after the death of the husband, one of the most important difficulties of the widow is reduced income (Groothest and Groenou 1999).

Other explanations for the worse health status of married women can be advanced, although the present study cannot directly assess their importance. One important factor is the time and emotional commitments of married life and whether these demands have a negative affect on health (Santana, Loomis and Newman 2001). In a Brazilian study of the main care-givers of people who had recently suffered their first stroke and who had returned to their families with some ADL dependency, Karsch (2003) found that most care-givers were from the household (98 %) and were women (93 %) – and that among the women, 44 per cent were spouses and 31 per cent daughters. There were also many cases of one older person taking care of another; indeed, care-givers aged 60–80 years took care of 62 per cent of the dependent seniors. These results confirm Ramos's (1992) findings, that most of those supporting older people living in the community were family members, most often spouses.

The results suggest that the marriage selection effect does not occur in the expected direction. Especially among women, those who were either single or divorced had better health than those who were married. Instead of healthier individuals being more likely to marry and to stay married, the inverse effect might occur: individuals with worse health being more likely to seek marriage. A full explanation is not possible with the available data, but it is possible that those with worse health seek a care-giver, while the better health of singles and the divorced occurs even among those who are care-givers (Karsch 2003). Another possibility is that that good health is a pre-condition for living alone, but even this is not a strong explanation, since only 28 per cent of the single and 35 per cent of the divorced were in this living arrangement.

Conclusions

It is believed that some unique Brazilian – and possibly Latin American – circumstances put elderly women who are married at a health disadvantage. Most older people can rely on their family to meet their general support and care needs, but in many families these resources are insufficient to guarantee access to high-quality health care. Besides the low

average income and its unequal distribution, other factors in Brazil include the low level of public resources dedicated to health, the comparatively low quality of public services, and the high cost of private providers. To access the needed services, older people have to rely on their individual resources, and it has been shown that women are as willing to use them as men. Women without an individual income are clearly at a disadvantage. The fact that relatively more married women than widows have no individual income to a large extent explains the finding that, on average, married women have worse health. This result is in part a function of the pension system, which compensates for the decline in income that follows widowhood. Widows have the same level of resources to meet their health needs as those still married.

Older people's income prospects in Brazil are uncertain. On the one hand, the social security system is already suffering the financial pressures of an ageing population. Any changes that reduce the value of the benefits will decrease the financial resources available to widows. On the other hand, the proportion of women without employment outside the home has been decreasing. Fewer married women will have the double vulnerability of no individual income and little leverage over household resources. One final comment is that the relationship between income and health can and hopefully will be changed by an improved public health-care system. If the public system provides better care for older people, the relative health benefit from an ability to purchase supplementary private-sector care will be reduced.

Recommendations

The health status and circumstances of married women should be a stronger priority for both research and policy in Brazil and comparable countries. As economic factors have not fully explained the worse health of married women, emphasis should be placed on the impact of women's care-giver roles and other family obligations. As income is an important factor, an interesting question is whether the source of income makes a difference. Given their cultural and economic similarities, this study should be replicated for other Latin American countries. The Brazilian federal government's *National Policy for Older People* does not explicitly target married older people, and most of its policies target those who live alone or are without strong family ties. Some federal programmes, and others at the state and local levels, might reach married women, but we recommend more attention to this group.

It is also recommended that the federal *Family Health Programme* recognises that elderly home-makers are particularly vulnerable. The FHP

is the premier primary health-care programme, and is delivered by teams of health-care professionals in specific geographic areas. Being an elderly home-maker can be considered a factor affecting a person's quality of life in her or his family context. The *Family Income Transfer* and *Continuous Benefit Assistance* social security programmes (which guarantee a minimum income) should be targeted at older people as individuals, rather than at their households. One way in which this could be accomplished is by raising the family income threshold when allocation to an individual woman is decided. On the same lines, the recently approved *Homemaker Pension Program* will have a beneficial impact, if successfully implemented by the government and accepted by the Brazilian population.

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NOTES

1 The data received for analysis have no personal information or identification of the participants. The same dataset was used in Scarton, Bós and Stobaus (2003), Bós and Bós (2004*a*), and Bós and Bós (2004*b*).
2 Detailed accounts are available from the authors upon request.
3 This model applies to categorical variables, where the specific numeric codes for the alternatives are irrelevant besides the order they imply, for instance, that good health implies a better outcome than poor health. An added feature of the model is that it used all five categories, avoiding the need for an arbitrary dichotomisation that would occur if the 'average', 'poor' and 'very poor' categories had been combined, or if the 'good' and 'excellent' categories had been pooled.
4 Although the imputation drew on information from outside the original dataset, the primary objective was to avoid losing information (for those subjects with missing values), not to explore other possible influences. Imputation is important when missing values are not randomly distributed, which could bias results. In the present study, income was most often missing among the widowed women who lived with their children (probably because they did not have access to this information). This imputation does not spuriously inflate the sample size since the original number of subjects is maintained. To assess whether the imputation introduced biases in the analysis, a marker variable in the regressions indicated the observations with imputed household income.

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