

**Health outcomes associated with marriage and marital dissolution in rural South Africa:  
The role of financial support**

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**Prepared for 2018 Population Association of America Annual Conference  
April-26-28 in Denver, Co**

906 Health and Well-being of Older Adults in Developing Countries  
201 Families, Health, and Well-being

**Short Abstract:** The relationship between marriage and health are not well understood in low- and middle-income countries. In this paper, we focus on a cohort of older women (40-plus) in rural South Africa to unpack associations between marital status and various health outcomes (hypertension, activities of daily living limitations, and depression), and the extent to which these associations are mediated or moderated by receipt of financial support from within one's social network. We use logistic regression to test these associations among data from the HAALSI study, conducted between 2014 and 2015. We find evidence that marital status is associated with women's health outcomes, and receipt of financial support can moderate these associations such that health outcomes are worse for women getting financial support. Implications for understanding the influences of unions on health and wellbeing in aging populations are discussed, as well as future plans to investigate other possible social support moderators.

## **Introduction**

Marriage is consistently associated with health benefits (Stimpson, Wilson, & Peek, 2012; Waite & Gallagher, 2002; Zhu & Gu, 2010). Although these health benefits have been studied extensively in many high-income countries (HICs), we know less about how health is associated with marital status in lower- and middle-income countries (LMICs), such as those in Sub-Saharan Africa. However, it is in these very settings where health challenges can be the greatest, especially as people age into older adulthood (Mayosi et al., 2009). Hence, it is crucial to understand what influences older adults' health and wellbeing in such settings (Cohen & Menken, 2006; Ralston, Schatz, Naidoo, & Kowal, 2017). In this study we will explore associations between marital status and certain health outcomes among a cohort of older women (aged 40-plus) in rural South Africa. We will then aim to unpack the extent to which health benefits of marriage may be impacted by the receipt of financial support. We will also discuss future plans to examine the moderating effects of other types of social support.

South Africa is one of the fastest aging LMICs, with the United Nations predicting the population over age 65 to almost triple between 2020 and 2060 (United Nations, 2015). Not only is South Africa's elderly population increasing in size, the population also faces an increasing burden of disease that includes endemic levels of HIV as well as a growing epidemic of non-communicable disease (Clark et al., 2015; Kahn et al., 2012; Mayosi et al., 2012; Negin & Cumming, 2010; Nyirenda et al., 2012). Moreover, much of the population lives in poverty, possibly affecting their access to resources that can benefit their health. Despite these important transitions, few research studies have investigated the relationship between marriage and health and wellbeing in later life in this context (an exception is Myroniuk, 2017). Marriage is a core social institution where individuals give and receive emotional and financial support (Cornwell, 2012; Waite & Gallagher, 2002), and is therefore likely to have important associations with health outcomes. Likewise, unmarried people are likely to face disadvantages in health outcomes, and these disadvantages may vary based on whether they never married or their marriage dissolved through either divorce or widowhood. The present study seeks to fill this gap, offering insight into how marital status may influence health outcomes, and how this relationship might be mediated or moderated by receipt of financial support from people within one's social network.

We use recent data from the Health and Aging in Africa: Longitudinal Studies of an INDEPTH Community (HAALSI): a cohort study of rural South Africans aged 40 and older, conducted between 2014 and 2015. We focus on an analytic sample of 2,542 women in this cohort. Although South Africa has a health profile of a low-income country, it has a robust economic system. However, because of the death or absence of their caregivers, those who survive into old age often have less social and familial support than in other contexts (Hosegood & Timaes, 2005; Kautz, Bendavid, Bhattacharya, & Miller, 2010; Schatz & Seeley, 2015). Therefore, the South African context provides a unique and important opportunity to investigate the relationship between marriage status, support and health and wellbeing in older ages.

## **Present Study**

Using the HAALSI data, we examine possible differences in health and economic support by marital status among women ages 40 and older in the Agincourt population. Agincourt is a rural, low income sub-district in Mpumalanga Province in the northeastern part of South Africa. We investigate whether there are differences in health based on marital status and receipt of financial support. We address these issues through the following questions: 1) Does health and wellbeing

vary by marital status?; 2) Does the amount of financial support received from people in women's social network help explain the associations between marital status and health, and 3) Does receipt of financial support moderate the association between marital status and health? In answering these questions we will add to the understanding of marriage benefits in this setting, including whether any health benefits of marriage (or disadvantages of non-marriage) differ by receipt of social support in the form of financial assistance.

### **Study Setting**

The study area for this investigation is a cluster of villages in and near Agincourt, South Africa—a rural, low income sub-district in Mpumalanga Province in the northeastern part of South Africa. In 2014, the time of this study, the population of the Agincourt sub-district was about 110,000 people living in 21,000 households across 31 villages. At that time approximately 12 percent of the population was aged 40 or older. The land in the region is not favorable for subsistence farming due to high population density and low rainfall (MRC/Wits Agincourt Unit, 2017). There is extraordinarily high unemployment; it is estimated that 60% of the male population aged 35-54 spend some time living outside of the area for temporary work opportunities (Kahn et al., 2007). Thus, labor migration greatly affects the gender distribution of the area and the marriage environment. In addition, women's life expectancy is longer than men's, resulting in a higher proportion of female residents overall, and a much higher number of older female than older male residents. In addition, due to high levels of poverty, most of the residents rely on social protection grants and migrant remittances for survival (Bertrand, Mullainathan, & Miller, 2003; Booysen & van der Berg, 2005; Case & Deaton, 1998; Twine, Collinson, Polzer, & Kahn, 2007).

South Africa has a distinctive marriage pattern compared to other countries in the region. In much of sub-Saharan Africa, marriage is considered “nearly universal” (Myroniuk, 2017, p. 656); however, in South Africa not everyone marries, with the rate of marriage particularly low among Black South Africans (Hosegood, McGrath, & Moultrie, 2009). Customary marriage is more common among Black South Africans than civil marriage, though only recognized by law since 2000 (Budlender, Chobokoane, & Simelane, 2004). Marriage patterns have been highly influenced by apartheid policies that separated families (Hosegood et al., 2009). Social and economic policies of the apartheid government decreased and destabilized marriage rates, particularly in rural areas. In particular, labor migration policies actively separated families. During this time individuals often found more reliable support from parents and siblings than marital partners (Niehaus, 1994). The policies fundamentally changed gender roles and sexual division of labor within marriages as women were forced to enter the labor market and provide for themselves and their children with or without their husbands' support and presence (Hosegood et al., 2009). Marriage has been influenced further by the more recent HIV/AIDS epidemic, which increases the risk of widowhood and remarriage (Hosegood et al., 2009). These various influences on marital trajectories may, in turn, have important impacts on health.

### **Conceptual Framing**

A large body of gerontological and sociological research stemming from HICs has established a positive relationship between marriage and health continuing into later life (Sullivan & Fenelon, 2014; Waite & Gallagher, 2002). It is unclear whether this is due to selection of healthier people into marriage or protection that marriage offers people against poor health (Carr & Bodnar-Deren, 2009; Waite & Gallagher, 2002). Marriage may provide a protective benefit to

individuals' health in the way of adding more social and economic support into their networks that translates into better health. There are also known differences in how marriage relates to health for men and women, with marriage being more protective for men than for women (Waite & Gallagher, 2002). In the present study, with a focus on older women in a setting where mortality remains high, we are able to compare the health outcomes associated with marriage, widowhood, singlehood, and marital dissolution resulting from separation or divorce. It is particularly useful to have a sample with a large proportion widowed, as this helps us to unpack the selection effect of marriage. With a significant proportion of widows, we can assess whether being marriage, per se, provides health protections or whether the kind of people who married (and remained married until the somewhat random event of their spouse's death) are healthier to begin with.

The limited studies on older adults in Sub-Saharan Africa have shown mixed results on the association between marital status and health. In a cross-sectional study of an elderly population in Cameroon, Kuate-Defo (2006) found that unmarried individuals self-reported lower levels of health but not greater physical limitation compared to married individuals. Previous research from our study site found that older persons who were single visited health facilities more often than married individuals, positing that single individuals may have more health issues (Gómez-Olivé, Thorogood, Clark, Kahn, & Tollman, 2013). In a study of the elderly in Malawi, a country with a high rate of marriage, Myroniuk (2017) found marital dissolution to be associated with slightly worse physical and emotional health. However, it is important to note most of this research does not distinguished between divorce and widowhood, often due to sample size issues (Myroniuk, 2017). This may prove to be an important distinction for health outcomes. Further, some research has suggested that women who are widowed may experience the greatest health decline, pointing to the loss of a spouse's family ties and support as a reason for this decline (Schatz, Madhavan, & Williams, 2011). Some research also implies, but does not empirically test, that divorced and widowed women are at a particular disadvantage due to male remarriage rates and inheritance practices (Bongaarts & Zimmer, 2002; Oppong, 2006).

## **Data and Sample**

The HAALSI study is a population-based survey that aims to examine and characterize a population of older men and women in rural South Africa with respect to health, physical and cognitive function, aging, and well-being.

Participants were sampled from the existing framework of the Agincourt HDSS. Individuals 40 years and older as of July 1, 2014 and permanently living in the study site during the 12 months previous to the 2013 census round were eligible for this study. Using the full 2013 Census data, a sampling frame of 8,974 women and 3,901 men aged 40 and older who met the residence criteria were identified. Based on power calculations for key health outcomes, the target sample size was approximately 5,000 completed interviews divided equally between women and men. Out of the 6,281 selected for the study, 391 had moved outside of the study site or were deceased. From the remaining 5,890 eligible individuals, 5,059 (86%) participated in the baseline survey. Two additional waves of longitudinal follow up of the cohort are planned over the next 5 years. Our analytic sample for this paper includes all women in HAALSI who do not have missing data on any of our key measures (described below). There were 2,714 women who participated in HAALSI and we analyze data from the 2,542 of them with complete information on our key measures.

All sampled individuals were visited at home from November 2014 to November 2015. Potential participants and respondents for the household-level survey items were invited to be part of the study and asked for informed consent. Trained, local fieldworkers collected survey data electronically using Computer Assisted Personal Interviews (CAPI). Extensive survey and laboratory data were collected to assess (i) Physical and cognitive functioning, (ii) Cardiometabolic health, (iii) Economic well-being, and (iv) HIV and HIV risk. Surveys were conducted in the local language, Shangaan, with instruments translated from English and back-translated to ensure reliability.

## **Measures**

*Dependent.* To assess the association between receipt of marital status, financial assistance and health we investigate three different health outcomes. The first is a dummy measure to indicate whether the respondent had hypertension. This measure was coded ‘1’ if the respondent had a mean systolic blood pressure  $\geq 140$  mmHg or mean diastolic blood pressure  $\geq 90$  mmHg or controlled blood pressure with self-reported use of hypertensive medication. Mean blood pressure was calculated using the average between the second and third of three readings taken two minutes apart. Our second health outcome measure is a dummy variable indicating that the respondent had at least one limitation in an activity of daily living (ADL). This measure is coded as ‘1’ if the respondent reported having difficulty with walking, bathing, eating, getting in/out of bed, or using the toilet. Finally, we use a dummy measure of depressive symptoms that is coded ‘1’ if the respondent scored 3 or higher on the CES-D (indicating that they fall within the highest quartile), which originally ranged from 0 to 8.

*Independent.* To measure marital status, we use a series of dummy variables reflecting, at the time of the survey, whether the respondent (1) has never been married, (2) is currently married or living with a partner, (3) is separated/deserted or divorced, or (4) is widowed.

To test the association of financial support on health outcomes, we use a measure of receipt of financial support from someone within respondents’ social network. This measure comes from the social networks portion of the HAALSI survey to indicate whether the respondent receives financial support from one of up to six possible people in their social network. To obtain this measure, respondents were first asked to name six adults, in order of importance, who they have been in communication with (in person, by phone, or by internet) over the previous six months. Respondents are then asked if they received financial support from each social contact they identified, with a survey item phrased: “Which of the following answers best describes how often you typically received financial support from [social network person], such as borrowing money, receiving food, being given a job or anything else related to money or in-kind transfers, over the past 6 months?” Response options included “every day or almost every day,” “a few times per week,” “once per week,” “a few times per month,” “once per month,” “a few times in the past 6 months,” and “not at all.” We code the measure of financial support as 1 if the person reported getting financial support from any of their named social contacts at least a few times per month in the past six months, and 0 otherwise.

*Covariates.* We control for other factors that might affect receipt of social support. First, we control for the respondent’s age. Age is coded into a series of five dummy variables to indicate decade of life, from ages 40-49 to ages 80 and above. We also control for respondents’ education, coded into three dummy variables that indicate that (1) the respondent had not completed any formal education, (2) the respondent has some primary or completed primary

education, or (3) the respondent has some secondary or higher education. Next, we control for respondents' primary employment status, which may affect their social connectedness. These measures come from a survey item in which respondents could check as many response options as applied to them. We coded their employment status as (1) employed if they checked employed, as (2) homemaker if they did not check employed by checked homemaker, (3) as retired, if they did not say they were employed or a homemaker, or (4) not working, if they did not say they were any of the previous statuses.

We control for a series of five dummy variables that indicate household wealth quintiles. Households were ranked according to the scores from principal components analysis of household ownership of items such as televisions, refrigerators, livestock, vehicles as well as housing characteristics, type of water and sanitation facilities (Filmer & Pritchett, 2001).

We also control for the total number of people living in respondents' household, top coded at 10, in order to capture how many live-in social contacts they have. We also attempt to account for possible caregiving burden the respondent may have with controls for the number of household members under the age of 15 (top-coded at 5 due to skewedness) and the number of household members above age 60 (top coded at 3). Next, we control for a dummy measure indicating whether the respondent reports providing care to family or a household member, coded 1 if so and 0 otherwise.

Lastly, because of evidence from this study that the timing of the interview, during the course of fieldwork, impacted interviewer-driven variability in respondents' reporting of their social networks (Harling et al., Forthcoming), we control for the month when the interview was conducted.

### **Analytic Approach**

We use logistic regression to estimate the odds of hypertension, ADL limitation, and depressive symptoms. We present results from logistic regression in odds ratios. Odds ratios can be easily transformed into percent change in the odds associated with each unit change in the respective independent variable by subtracting 1 from the odds ratio and multiplying by 100.

### **Preliminary Results**

#### *Descriptives*

Table 1 displays mean values for each of the variables used in our analyses. Sixty-one percent of women have hypertension, only 8% have one ADL limitation, and 18% fall above the threshold for depression. Nearly half of the sample (46%) is widowed, and another 37% is married or cohabiting. Thirteen percent are divorced or separated from their spouse, and a minority (4%) never married. In terms of receipt of financial support, 64% of the sample received financial support from someone in their social network at least a few times a month in the six months preceding the survey.

The largest proportion of the sample falls within ages 50-59 (29%), followed by 60-69 (25%) and 40-49 (19%). Half of the sample had no formal education, a third received primary education, and 17% received secondary education. A minority of women in our sample (13%) are employed, and 13% of the remaining report being homemakers. Another 19% are retired, and the remaining 55% are not working. On average, respondents are living in households with about five total members, about two members under the age of 15, and approximately one member above age 60. About a quarter of the sample (27%) provides care to a family or household member.

### *Hypertension*

Next, in Table 2, we use logistic regression to estimate the odds of having hypertension based on marital status and receipt of financial support. In Model 1 we find evidence that the never married face 46% lower odds of having hypertension than the married/cohabiting. This association among the separated/divorced and widowed does not reach significance.

In Model 2 we add in a control for receipt of financial support, to estimate the extent to which the association between marital status and hypertension may be mediated by financial support. Receiving financial support from someone in the respondents' social network is not significantly associated with the odds of having hypertension, and adding this measure to the model does not change the odds ratio associated with never being married. Hence, we find little evidence of a mediating effect of financial support.

In Model 3 we test an interaction to estimate whether receipt of financial support moderates the association between marital status and hypertension. We find that receipt of financial support does significantly moderate the association between never being married and odds of hypertension, such that never married women have 2.15 (0.95\*2.26) times greater odds of having hypertension if they receive financial support from someone in their social network than if they do not.

### *Activities of Daily Living*

Table 3 uses logistic regression to investigate the odds of having at least one ADL limitation. In Model 1, we find that separated and divorced women face 1.93 greater odds of an ADL limitation than married/cohabiting women, while widowed women face 65% greater odds than married/cohabiting women.

In Model 2 we find that receipt of financial support is not significantly associated with the odds of having an ADL limitation, and the inclusion of the measure in the model does not largely impact the association between marital status and ADL limitation. Moreover, in Model 3 we find no evidence that receipt of financial support moderates the association between marital status and having an ADL limitation.

### *Depression*

In Table 4 we estimate the odds of scoring within the highest quartile on the CES-D depression score. In Model 1 we find that widowed women face about 43% greater odds of depression than married/cohabiting women, but no significant association for the never married or the separated/divorced.

In Model 2 we find, again, that receipt of financial support is not significantly associated with the odds of depression. However, in Model 3, we find that receipt of financial support significantly moderates the association between being separated/divorced and odds of depression. Separated/divorced women who get financial support from someone in their social network face 1.86 times greater odds of depression than separated/divorced women who do not get financial support.

### **Discussion and future directions**

Our preliminary results suggest that there are some important associations between marital status and health among this cohort of older women in rural South Africa. Women who have been single their entire lives face lower odds of hypertension, while women who are either



separated/divorced or widowed face higher odds of having an ADL limitation. Moreover, widowhood is associated with a higher depression score. Over the next few weeks we will interpret these findings in light of possible mechanisms through which these associations may be operating.

Our findings that receipt of financial support can moderate the association between never being married and hypertension, and the association between being separated/divorced and having depressive symptoms such that receipt of financial support increases the risk of those health outcomes is unexpected. It is likely that those in worse health attract more financial support from their social network, and this may explain the moderating effects we find. Our next steps will involve investigating this further, including investigation of whether other types of social support have similar or opposite moderating effects. The social networks portion of the HAALSI survey collects information not only about financial support, but also emotional support, informational support, and physical support. We will investigate how these other kinds of social support may come into play.

We will also work to match the WHO-SAGE data from 2006 and 2010 to allow us to control for past health status. The WHO-SAGE survey focuses on older persons' health and wellbeing and was conducted in the site with individuals aged 50 and older. The aim of the study was to promote a better understanding of the effects of ageing on wellbeing and other health outcomes in LMICs (Kowal et al., 2012). WHO-SAGE provides individual level data including socio-demographic characteristics, health status, physical functioning, subjective wellbeing, risk factors and health behaviors, social cohesion, and work history. Of the HAALSI respondents 3,928 were previously selected for the WHO-SAGE 2010 study, and 298 were previously selected for the WHO-SAGE Long 2006 study, with some overlap between selections for all of these studies.

**Acknowledgements:** The HAALSI study was funded by NIA of the NIH (P01 AG041710). HAALSI is nested within the Agincourt Health and Socio-Demographic Surveillance System, with funding from Wellcome Trust (058893/Z/99/A; 069683/Z/02/Z; 085477/Z/08/Z; 085477/B/08/Z), University of the Witwatersrand, and Medical Research Council, South Africa.

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Table 1: Descriptive Statistics, Sample of 2542 Women

	Mean	SD	Min	Max
<b>Health Outcomes</b>				
Hypertension	0.61		0	1
ADL limitation (at least one)	0.08		0	1
Depression	0.18		0	1
<b>Financial Support</b>				
Receives financial support from a person in social network	0.65		0	1
<b>Marital Status</b>				
Married/cohabiting	0.37		0	1
Never married	0.04		0	1
Separated/divorced	0.13		0	1
Widowed	0.46		0	1
<b>Controls</b>				
Age				
40-49	0.19		0	1
50-59	0.29		0	1
60-69	0.25		0	1
70-79	0.15		0	1
80-89	0.12		0	1
Education				
No formal	0.49		0	1
Primary	0.33		0	1
Secondary	0.17		0	1
Employment status				
Not working	0.55		0	1
Employed	0.13		0	1
Homemaker	0.13		0	1
Retired	0.19		0	1
Wealth index				
Poorest	0.20		0	1
Poor	0.20		0	1
Middle	0.20		0	1
Less poor	0.20		0	1
Least poor	0.20		0	1
Total number of household members	5.26	2.7	1	10
Number of permanent household members under age 15, top coded at 5				
	1.87	1.57	0	5
Number of permanent household members over age 60, top coded at 3				
	0.71	0.69	0	3
Provides care to family or household member	0.27	0.44	0	1
Interview month	5.47	3.03	1	12

Table 2: Odds Ratios from Logistic Regression Predicting Hypertension

	Model 1		Model 2		Model 3	
	Odds ratio	Z ratio	Odds ratio	Z ratio	Odds ratio	Z ratio
<b>Marital Status (Ref=Married/cohabiting)</b>						
Never married	0.54**	-2.86	0.54**	-2.89	0.33**	-3.08
Separated/divorced	1.14	0.92	1.14	0.87	1.08	1.31
Widowed	0.85	-1.50	0.84	-1.57	0.87	-0.53
<b>Financial Support</b>						
Receives financial support from a person in social network			0.95	-0.53	0.95+	-1.81
<b>Interactions</b>						
Never married X SN Financial Support					2.26+	1.81
Separated/divorced X SN Financial Support					1.07	0.24
Widowed X SN Financial Support					0.92	-0.43
<b>Controls</b>						
Age (Ref= 40s)						
50-59	2.16***	6.02	2.17***	6.03	2.16***	6.01
60-69	2.75***	5.61	2.75***	5.61	2.77***	5.64
70-79	3.39***	6.00	3.39***	6.00	3.46***	6.08
80-89	5.39***	7.40	5.42***	7.42	5.49***	7.46
Education (Ref=Secondary+)						
No formal	1.12	0.76	1.12	0.76	1.12	0.80
Primary	1.10	0.70	1.10	0.72	1.11	0.77
Employment status (Ref=Not working)						
Employed	0.94	-0.43	0.94	-0.44	0.94	-0.47
Homemaker	1.07	0.47	1.06	0.40	1.06	0.41
Retired	1.17	1.27	1.17	1.25	1.17	1.23
Wealth index (Ref=Poorest)						
Poor	1.04	0.26	1.04	0.27	1.05	0.34
Middle	0.96	-0.30	0.96	-0.28	0.97	-0.20
Less poor	1.29+	1.84	1.29+	1.83	1.30+	1.89
Least poor	1.22	1.34	1.22	1.35	1.22	1.38
Total number of household members	0.97	-1.15	0.97	-1.12	0.97	-1.11
Number of permanent household members under age 15, top coded at 5	0.99	-0.16	0.99	-0.18	0.99	-0.23
Number of permanent household members over age 60, top coded at 3	0.98	-0.27	0.98	-0.26	0.97	-0.35
Provides care to family or household member	1.05	0.46	1.05	0.44	1.05	0.45
Interview month	0.99	-0.85	0.99	-0.86	0.99	-0.79
N		2542		2542		2542

two-tailed tests, + p<.10 , \* p<.05, \*\*P<.01, \*\*\* p<.001

Table 3: Odds Ratios from Logistic Regression Predicting ADLs (at least one limitation)

	Model 1		Model 2		Model 3	
	Odds ratio	Z ratio	Odds ratio	Z ratio	Odds ratio	Z ratio
<b>Marital Status (Ref=Married/cohabiting)</b>						
Never married	0.93	-0.14	0.91	-0.18	1.54	0.63
Separated/divorced	1.93*	2.31	1.88*	2.23	1.60	1.01
Widowed	1.65*	2.13	1.60*	2.00	1.34	0.78
<b>Financial Support</b>						
Receives financial support from a person in social network			0.87	-0.89	0.72	-0.88
<b>Interactions</b>						
Never married X SN Financial Support					0.25	-1.12
Separated/divorced X SN Financial Support					1.27	0.43
Widowed X SN Financial Support					1.31	0.65
<b>Controls</b>						
Age (Ref= 40s)						
50-59	1.03	0.10	1.04	0.11	1.05	0.15
60-69	0.98	-0.04	0.99	-0.04	0.98	-0.04
70-79	2.08+	1.80	2.09+	1.81	2.07+	1.78
80-89	4.05***	3.38	4.12***	3.42	4.10***	3.40
Education (Ref=Secondary+)						
No formal	1.27	0.72	1.28	0.73	1.26	0.70
Primary	1.15	0.43	1.16	0.45	1.15	0.42
Employment status (Ref=Not working)						
Employed	0.74	-0.86	0.74	-0.86	0.74	-0.87
Homemaker	0.39**	-2.90	0.38**	-2.98	0.38**	-2.99
Retired	1.49*	2.24	1.48*	2.16	1.48*	2.19
Wealth index (Ref=Poorest)						
Poor	1.15	0.63	1.16	0.66	1.14	0.58
Middle	1.02	0.06	1.02	0.09	1.01	0.05
Less poor	0.93	-0.29	0.93	-0.31	0.92	-0.34
Least poor	0.90	-0.38	0.91	-0.34	0.90	-0.37
Total number of household members	1.06	1.13	1.06	1.17	1.06	1.18
Number of permanent household members under age 15, top coded at 5	0.89	-1.39	0.88	-1.43	0.88	-1.41
Number of permanent household members over age 60, top coded at 3	1.07	0.41	1.08	0.41	1.08	0.45
Provides care to family or household member	1.12	0.62	1.11	0.58	1.11	0.58
Interview month	0.95+	-1.92	0.95+	-1.94	0.95*	-1.98
N	2542		2542		2542	

two-tailed tests, + p<.10 , \* p<.05, \*\*P<.01, \*\*\* p<.001

Table 4: Odds Ratios from Logistic Regression Predicting Depression (code of 3 or higher out of 8 on CESD)

	Model 1		Model 2		Model 3	
	Odds ratio	Z ratio	Odds ratio	Z ratio	Odds ratio	Z ratio
<b>Marital Status (Ref=Married/cohabiting)</b>						
Never married	1.02	0.05	0.99	-0.05	0.69	-0.70
Separated/divorced	1.28	1.32	1.25	1.17	0.67	-1.21
Widowed	1.43*	2.42	1.38*	2.17	1.32	1.23
<b>Financial Support</b>						
Receives financial support from a person in social network			0.84	-1.61	0.71	-1.54
<b>Interactions</b>						
Never married X SN Financial Support					1.73	0.85
Separated/divorced X SN Financial Support					2.62*	2.45
Widowed X SN Financial Support					1.03	0.10
<b>Controls</b>						
Age (Ref= 40s)						
50-59	1.05	0.23	1.05	0.27	1.05	0.25
60-69	1.34	1.20	1.34	1.21	1.35	1.23
70-79	1.57+	1.73	1.58+	1.74	1.58+	1.74
80-89	2.53***	3.41	2.59***	3.49	2.61***	3.51
Education (Ref=Secondary+)						
No formal	1.21	0.91	1.21	0.91	1.20	0.89
Primary	1.29	1.29	1.29	1.32	1.30	1.36
Employment status (Ref=Not working)						
Employed	0.70+	-1.76	0.70+	-1.78	0.68+	-1.89
Homemaker	0.43***	-4.33	0.42***	-4.49	0.41***	-4.50
Retired	0.87	-0.98	0.86	-1.08	0.85	-1.19
Wealth index (Ref=Poorest)						
Poor	1.15	0.85	1.16	0.89	1.16	0.88
Middle	1.46*	2.30	1.47*	2.34	1.49*	2.41
Less poor	0.98	-0.13	0.97	-0.17	0.98	-0.13
Least poor	1.13	0.67	1.14	0.71	1.13	0.66
Total number of household members	0.96	-1.13	0.96	-1.06	0.97	-0.97
Number of permanent household members under age 15, top coded at 5	1.03	0.42	1.02	0.35	1.01	0.22
Number of permanent household members over age 60, top coded at 3	1.22+	1.69	1.22+	1.72	1.22+	1.71
Provides care to family or household member	1.42**	2.89	1.42**	2.86	1.42**	2.88
Interview month	1.02	0.95	1.02	0.91	1.02	0.88
N	2542		2542		2542	

two-tailed tests, + p<.10 , \* p<.05, \*\*P<.01, \*\*\* p<.001