Social network typologies and mortality risk among older people in China, India, and Latin America: A 10/66 Dementia Research Group population-based cohort study

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A B S T R A C T

Background: Restricted social networks have been associated with higher mortality in several developed countries but there are no studies on this topic from developing countries. This gap exists despite potentially greater dependence on social networks for support and survival due to various barriers to health care and social protection schemes in this setting. Thus, this study aims to examine how social network type at baseline predicts all-cause mortality among older adults in six Latin American countries, China, and India.

Methods: Population-based surveys were conducted of all individuals aged 65+ years in eight countries (Cuba, Dominican Republic, Peru, Venezuela, Mexico, Puerto Rico, China, and India). Data on mortality were obtained at follow-up (mean 3.8 years after cohort inception). Follow-up data for 13,891 individuals were analysed. Social network types were assessed using Wenger's Practitioner Assessment of Network Type (PANT). Cox proportional hazard models were constructed to estimate the impact of social network type on mortality risk in each country, adjusting for socio-demographics, receipt of pension, disability, medical conditions, and depression. Meta-analysis was performed to obtain pooled estimates.

Results: The prevalence of private network type was 64.4% in urban China and 1.6% in rural China, while the prevalence of locally integrated type was 6.6% in urban China and 86.8% in rural China. The adjusted pooled estimates across (a) all countries and (b) Latin America showed that, compared to the locally integrated social network type, the locally self-contained [(b) HR = 1.24, 95%CI 1.01−1.51], family dependent [(a) HR = 1.13, 95%CI 1.01−1.26; (b) HR = 1.13, 95%CI 1.001−1.28], and private [(a) HR = 1.36, 95%CI 1.06−1.73; (b) HR = 1.45, 95%CI 1.20−1.75] social network types were significantly associated with higher mortality risk.

Conclusion: Survival time is significantly reduced in individuals embedded in restricted social networks (i.e. locally self-contained, family dependent, and private network types). Social care interventions may be enhanced by addressing the needs of those most at risk of neglect and deteriorating health. Health policy makers in developing countries may use this information to plan efficient use of limited resources by targeting those embedded in restricted social networks.

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1. Introduction

Worldwide, the number of people aged 65 years and above will outnumber children under age five by 2016, implying a radical increase in the proportion of old to young (WHO, 2011). Demographic ageing is associated with an increase in the burden of morbidity, disability, and dependency, which in turn will increase the demand on health care services and social costs. This increase in demand may be particularly significant in developing countries, where population ageing is occurring at a faster pace than in developed countries. For example, in 2010, the global population of people aged 60 years and above residing in developing countries was 65%, and this figure is projected to increase to 80% by 2050 (Kinsella and Wan, 2009). Many developing countries do not have the industrial and socio-economic resources to support the increasing health and social care demands associated with an ageing population, and are typically characterised by significant infrastructural barriers to accessing existing social protection schemes (WHO, 2011).

The lack of social protection for older people in developing countries is increasingly becoming recognised as a significant but yet under-prioritised problem in health and human development agendas (Cho et al., 2012; Prince et al., 2008; UN, 2002; UNAIDS, 2010). This is in spite of evidence showing the importance of various socioeconomic factors and vulnerabilities in predicting mortality among older people in developing countries (Ferri et al., 2012). Social networks can be a source of financial, practical and emotional support, and hence represent a key component to social protection. The importance of social networks for health and wellbeing has been extensively demonstrated in high-income countries. In a recent meta-analysis of 20 population-based cohort studies, social network integration, was inversely associated with mortality [HR = 0.91, 95%CI (0.86; 0.97)] (Nyqvist et al., 2014). Another meta-analysis also involving studies mainly in high-income countries found that the effect size for the association of poor social relationships with mortality was comparable to that for excessive drinking, and smoking, and greater than that for obesity, and lack of exercise (Holt-Lunstad et al., 2010). In the case of older people specifically, studies conducted in high-income countries have reported that maintaining social contacts in late life is associated with a reduced risk of psychological distress (Golden et al., 2009; Reich and Zautra, 1991), cognitive decline (Bassuk et al., 1999; Fratiglioni et al., 2000), functional decline (Stuck et al., 1999), disability (Avlund et al., 2004; Escobar-Bravo et al., 2012), institutionalization, and mortality (Steinbach, 1992). For the developing countries involved in the current study, being embedded in restricted social networks has been reported to be positively correlated with loneliness, depression, less happiness, poor health, disability, and need for care (Thiyagarajan et al., 2014). As yet, however, there are no studies specifically on social networks and its effect on mortality in developing country settings.

Using a large multi-country population-based sample, the aim of this study is to assess the association of social network type with all-cause mortality among older people living in India, China, and six Latin American countries. The countries participating in the 10/66 Dementia Research Group's population-based research program were not purposively selected, but rather represent those that chose to join the group in the late 1990s to conduct research into a topic of growing social and public health significance. These were all, at that time, or shortly to become, middle income countries, and are all undergoing particularly rapid population ageing and economic development, with attendant social change. Nevertheless, the countries and sites comprise considerable diversity in culture, sociodemographic and health characteristics. Correlations between social networks and health have been reported previously, at the baseline of these cohorts (Thiyagarajan et al., 2014). For these reasons, all countries with mortality outcomes recorded at follow-up were retained for this analysis. Based on the literature discussed, we hypothesise that more restricted network types will be associated with higher mortality. Harnessing information about how restricted social network types predict increased mortality risk is particularly important in the economic context of low and middle income countries, where resources are limited and people are more likely to depend on their social networks for support and survival. Understanding the association between social network structures and mortality may be relevant in regards to allocating limited resources or establishing public health interventions to improve population health and well-being in developing countries.

2. Methods

2.1. Study design, settings and sample

The baseline for this cohort study is defined by the 10/66 population-based prevalence surveys conducted of residents aged 65 years and above in geographically defined catchment area sites in the subset of eight countries (Cuba, Dominican Republic, Peru, Venezuela, Mexico, Puerto Rico, China, and India) where follow-up assessments of vital status were subsequently carried out. All of these eight countries are still classified as middle-income countries, except for Puerto Rico, which changed its status to high-income between the two surveys.

Details of study methodology and protocols have been described elsewhere (Ferri et al., 2012; Prince et al., 2007). In brief, baseline assessments were carried out between 2003 and 2006 with the exception of Puerto Rico (2007–2009). The 10/66 study questionnaires were translated from the original English into Spanish, Tamil, and Mandarin. The study sites consisted of urban and rural areas. Urban sites which represented the typical predominately lower income or mixed neighbourhoods were purposively selected and consisted of the following sites: Cuba (Havana and Matanzas), Dominican Republic (Santo Domingo), Venezuela (Caracas), Peru (Lima), Mexico (Mexico City), Puerto Rico (Bayamon), China (Xicheng, Beijing) and India (Chennai). Rural sites referred to areas remote from major population centres with agriculture and related trade as the main local industry and included the following: Peru (Cañete Province), Mexico (Morelos State) and China (Daxing, Beijing Province).

The original target sample size for each country was between 2000 and 3000 (see Table 1). The boundaries of each catchment area were precisely defined, and households mapped. Each household was then systematically door-knocked to identify all household members aged 65 years and over who were eligible to participate in the survey. A full assessment (lasting 2–3 h) was conducted for all eligible individuals if they or their kin agreed to participate in the survey. The assessment comprised a background sociodemographic, health and risk factor interview, a structured clinical mental state assessment, and a physical examination. For those with marked communication difficulties arising from dementia, severe mental illness, deafness or mutism, the background interview, which included the social network assessment, was administered to a key informant (Prince et al., 2007).

Each centre had a coordinator who supervised the interviewers. There were between four and ten interviewers for each site, usually non-specialist graduates (apart from Cuba and China where medical doctors were used) extensively trained for the interviews and the main diagnostic assessment. Previous experience was also gained during the dementia diagnostic pilot study. Several meetings for the principal investigators were also conducted before the start of fieldwork, and at regular intervals of six months during the project. A standardised operating procedure manual covering all aspects of the interviews and procedures was also available to all interviewers, who were supervised during the fieldwork until the quality of the