



## Gender differences on the impacts of social exclusion on mortality among older Japanese: AGES cohort study

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### ABSTRACT

To evaluate the gender-specific impact of social exclusion on the mortality of older Japanese adults, we performed a prospective data analysis using the data of the Aichi Gerontological Evaluation Study (AGES). In AGES, we surveyed functionally independent residents aged 65 years or older who lived in six municipalities in Aichi prefecture, Japan. We gathered baseline information from 13,310 respondents in 2003. Information on mortality was obtained from municipal databases of the public long-term care insurance system. All participants were followed for up to 4 years. We evaluated social exclusion in terms of the combination of social isolation, social inactivity, and relative poverty. Cox's proportional hazard model revealed that socially excluded older people were at significantly increased risk (9–34%) for premature mortality. Those with simultaneously relative poverty and social isolation and/or social inactivity were 1.29 times more likely to die prematurely than those who were not socially excluded. Women showed stronger overall impact of social exclusion on mortality, whereas relative poverty was significantly associated with mortality risks for men. If these associations are truly causal, social exclusion is attributable to 9000–44,000 premature deaths (1–5%) annually for the older Japanese population. Health and social policies to mitigate the issue of social exclusion among older adults may require gender-specific approaches.

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### Introduction

There is a growing interest in the concept of *social exclusion*. Social exclusion is closely associated with material deprivation due to poverty but it covers wider and dynamic dimensions, including deprivation in social networks, living arrangements, goods, employment, access to benefits, and cultural capitals (Berghman, 1995). Social exclusion is a “multidimensional” problem and a “dynamic process”, whereas the traditional concept of poverty focuses on “income” and “static outcome”. As shown in Table 1, various methods for measuring social exclusion exist. Barnes (2002) emphasized the importance of measuring the dimensions of interpersonal relationships and social participation. As Barnes argued, because “poverty is not simply about income, but about a lack of resources that impedes participation in society, measuring poverty requires detailed analysis of multiple deprivation and participation issues. Social exclusion focuses more on relational

issues; in other words, inadequate social participation, lack of social integration and lack of power.” Note that the term “social exclusion” has been used in a different context in social psychology. Specifically, the negative consequence of unfavorable interpersonal relationships (e.g., being rejected by one's peers) is similar to other concepts, such as social rejection and social ostracism (Baumeister, DeWall, Ciarocco, & Twenge, 2005; Nolan, Flynn, & Garber, 2003; Williams, Forgas, & von Hippel, 2005).

The World Health Organization has mentioned that “Poverty, relative deprivation and social exclusion have a major impact on health and premature death” (Wilkinson & Marmot, 2003). In fact, there are a large number of studies that focus on specific dimensions of social exclusion and health, for example, relative poverty, socioeconomic inequality, and neighborhood relationships (Kawachi, 2000; Kondo, Kawachi, Subramanian, Takeda, & Yamagata, 2008; Kondo, Sembajwe, et al., 2009; Leclerc, Chastang, Menvielle, & Luce, 2006). However, there are few studies that have analyzed the impact of accumulation of poverty and social disintegration. It is highly likely that an individual's experiences overlap in multiple dimensions of social exclusion, and we should

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**Table 1**  
Existing indices/measures of social exclusion.

Study	Domain (Dimension)
European Commission (2002) "non-monetary indicators from EUROSTAT"	(1) Enforced lack of desired possessions (2) Absence of basic housing facilities (3) Problems with accommodation and the environment (4) Lack of ability to afford most basic requirements (5) Inability to meet payment schedules
Bradshaw, Williams, and Levitas (2000)	(1) Poverty / Lack of socially perceived necessities (2) Exclusion from the labor market (3) Service excluded (4) Exclusion from social relations
Burchardt, Grand, and Piachaud (2002)	(1) Consumption (2) Production (3) Political engagement (4) Social interaction
Choffe (2001)	(1) Income exclusion (2) Employment (3) Housing (4) Health (5) Family exclusion (6) Cultural exclusion
Percy-Smith (2000)	(1) Economic (2) Social (3) Political (4) Neighborhood (5) Individual (6) Spatial (7) Group
Tsakoglou (2003)	(1) Poverty (2) Amenities deprivation (3) Durables deprivation (4) Necessities deprivation

focus on the overall impact of status for socially excluded individuals rather than the individual impact of each specific dimension. Scharf, Phillipson, and Smith (2004) conducted a cross-sectional survey in three socially deprived areas, and observed that older people who experienced multiple forms of social exclusion were significantly likely to rate their quality of life as poor or very poor. To our knowledge, there has been no large-scale cohort research that has assessed the relative and attributable impact of social exclusion on health among older Asian people. In addition, gender differences have not been well studied.

The issue of social exclusion may be of particular importance in Japan, where the population is currently the oldest in the world (Ikeda et al., 2011; United Nations, 2001). Older persons are likely to be financially vulnerable and at risk for being isolated (O'Rand, 1996). The Japanese government has recognized that 25% of older (aged 65 years or more) citizens live below the official poverty line, whereas the proportion is 16.0% among the general population (Cabinet Office of Japan, 2010a, 2010b). This is not a small proportion for a developed country (MHLW, 2011; OECD, 2005, 2011). However, social exclusion and other key socioeconomic determinants of health are rarely applied in health and social policy in Japan. The purpose of this study was to evaluate the relative and attributable impact of social exclusion on mortality among older Japanese adults.

## Methods

### Study subjects

We used data from a prospective Japanese cohort study, the Aichi Gerontological Evaluation Study (AGES). AGES was a mail survey of 29,374 people aged 65 or older who were randomly

selected from the older residents of six municipalities in the Chita peninsula, Aichi prefecture, Japan (Kondo, 2010; Nishi, Kondo, Hirai, & Kawachi, 2011). Baseline information was gathered in 2003, with a response rate of 50.4% ( $n = 14,804$ ). We used baseline data from 13,310 functionally independent respondents who did not have any problems with activities of daily living in terms of walking, toileting, and bathing. Information on mortality was obtained from the database of the public long-term care insurance system, which is run by the municipal government. The mean age of participants was 72.8 years ( $SD = 5.8$ ), and 51.1% were women. Our study protocol and questionnaire procedure were approved by the Ethics Committee in Research of Human Subjects at Nihon Fukushi University. Written informed consent was assumed by voluntary return of the questionnaire.

### Measurements

#### Evaluation of social exclusion

We used relative poverty, social isolation, and social inactivity due to inevitable reasons to measure social exclusion. Relative poverty was defined as below half of the median annual income; the threshold was 1.13 million Japanese yen. This definition of relative poverty was originally from OECD, which conceptually relies on the relative approach of the Luxembourg Income Study (Forster, 1994). We used annual household pre-tax income. For each response, we equalized household income for household size, dividing income by the square root of the number of household members.

Townsend (1963) defined isolation as "having few contacts with family and community." In this study, we evaluated both face-to-face and non-face-to-face contacts using the following questions; "How often do you see your family members or relatives who are living apart?" and "How often do you make contact with your family members or relatives who are living apart by letter, telephone, or email?" We included six response options for the frequency of contact, ranging from "almost everyday" to "almost never." We also asked the same questions for contact with close friends. Respondents who selected "one or two times per month" or less with both relatives and close friends were considered as being "isolated."

Socially inactive people could be socially excluded, if they are inactive for inevitable reasons, which are reasons that are not easily changed by oneself or of personal choice. Our question about hobbies/activities included eight types of activities: sports, cultural, music, creative, horticulture, watching TV, traveling, and stock investments. For respondents who answered "no hobby", we asked about reasons for lack of participation in any hobbies/activities. Response options were: 1. "I don't have enough motivation," 2. "I discontinued for some reason," 3. "I cannot find anything interesting," 4. "I feel it troublesome to associate with people," 5. "I don't have enough money," 6. "I don't have enough time," 7. "I've had no opportunities," and 8. "Other." Respondents were recognized as having "no hobby due to inevitable reasons" if they selected options 5 or 7, because "no opportunity" and "no money" were clearly not based on individual choice. Although other options may also be inevitable reasons in certain contexts, we did not use these options in order to eliminate any possibility of nonparticipation due to personal choice. For example, those who selected option 2 and/or 6 may have discontinued their hobby or activity because they had other social obligations other than the hobby or activity (e.g. job or volunteer work).

According to these evaluations, we grouped our study participants into four categories: (a) not socially excluded, (b) living in relative poverty, (c) socially isolated and/or socially inactive, and (d) living in relative poverty and socially isolated/inactive. We created

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