



## Health inequalities in Japan: The role of material, psychosocial, social relational and behavioural factors



Ayako Hiyoshi<sup>a,b,c,\*</sup>, Yoshiharu Fukuda<sup>d</sup>, Martin J. Shipley<sup>a</sup>, Eric J. Brunner<sup>a</sup>

<sup>a</sup> Research Department of Epidemiology and Public Health, University College London, London, United Kingdom

<sup>b</sup> Clinical Epidemiology and Biostatistics, Örebro University Hospital, Örebro, Sweden

<sup>c</sup> School of Health and Medical Sciences, Örebro University, Örebro, Sweden

<sup>d</sup> Department of Community Health and Medicine, Yamaguchi University School of Medicine, Ube, Japan

### ARTICLE INFO

#### Article history:

Available online 8 January 2014

#### Keywords:

Japan  
Health inequalities  
Socioeconomic  
Social class  
Income  
Self-rated health

### ABSTRACT

The extent that risk factors, identified in Western countries, account for health inequalities in Japan remains unclear. We analysed a nationally representative sample (Comprehensive Survey of Living Conditions surveyed in 2001 ( $n = 40,243$ )). The cross-sectional association between self-rated fair or poor health and household income and a theory-based occupational social class was summarised using the relative index of inequality [RII]. The percentage attenuation in RII accounted for by candidate contributory factors – material, psychosocial, social relational and behavioural – was computed. The results showed that the RII for household income based on self-rated fair or poor health was reduced after including the four candidate contributory factors in the model by 20% (95% CI 2.1, 43.6) and 44% (95% CI 18.2, 92.5) in men and women, respectively. The RII for the Japanese Socioeconomic Classification [J-SEC] was reduced, not significantly, by 22% (95% CI –6.3, 100.0) in men in the corresponding model, while J-SEC was not associated with self-rated health in women. Material factors produced the most consistent and strong attenuation in RII for both socioeconomic indicators, while the contributions attributable to behaviour alone were modest. Social relational factors consistently attenuated the RII for both socioeconomic indicators in men whereas they did not make an independent contribution in women. The influence of perceived stress was inconsistent and depended on the socioeconomic indicator used. In summary, social inequalities in self-rated fair or poor health were reduced to a degree by the factors included. The results indicate that the levelling of health across the socioeconomic hierarchy needs to consider a wide range of factors, including material and psychosocial factors, in addition to the behavioural factors upon which the current public health policies in Japan focus. The analyses in this study need to be replicated using a longitudinal study design to confirm the roles of different factors in health inequalities.

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### Introduction

Although Japan is one of the countries with the longest life expectancy in the world, with 83 years at birth (World Health Organization, 2013), socioeconomic inequalities in health are still evident across a number of health outcomes. Individual-level analyses have shown inequalities in all-cause and chronic disease mortality and incidence (Kagamimori, Gaina, & Nasermoaddeli, 2009), and such disparities appear to have persisted for over two decades (Hiyoshi, Fukuda, Shipley, Bartley, & Brunner, 2013a).

Despite these persisting health inequalities, perspectives on health inequalities had been absent in national strategies on health policies, with strategies to improve health relying heavily on an individualistic approach and focused on behavioural aspects. The second stage of the 'Healthy Japan 21' was implemented in 2012 with one of its objectives being to reduce area (prefectural) disparities in healthy life expectancy, defined by the absence of limitations in daily living or self-rated fair or poor health (Ministry of Health, Labour and Welfare [MHLW], 2012). Although it is not yet clear whether aspects other than area disparities in health are considered or how area disparities in healthy life expectancy are redressed, the inclusion of the concept of social inequalities in health represents a considerable shift in the policy discussion in Japan.

\* Corresponding author. Clinical Epidemiology and Biostatistics, S-huset, Örebro University Hospital, 701 85 Örebro, Sweden.

E-mail addresses: [ayako.hiyoshi@orebroll.se](mailto:ayako.hiyoshi@orebroll.se), [ayako.hiyoshi.09@ucl.ac.uk](mailto:ayako.hiyoshi.09@ucl.ac.uk) (A. Hiyoshi).

Health inequalities are not 'reducible' to behaviours alone (Dunn, 2010), and public health interventions targeting individual's health behaviour may even widen social patterning in behaviours. After controlling for behaviours rigorously, some have shown that health inequalities still remain (Stringhini et al., 2010). In addition, material, psychosocial and social relational factors have been identified to explain systematic differences in health according to socioeconomic position [SEP] (Aldabe et al., 2011; Brunner, 2007; Laaksonen, Roos, Rahkonen, Martikainen, & Lahelma, 2005). Housing conditions have been reported to relate to mental and physical health through house temperature, noise, cleanliness and hygiene (Thomson, Thomas, Sellstrom, & Petticrew, 2013), and those who were not homeowners have been exposed to a greater number of health damaging factors (Macintyre et al., 2003). The psychological approach recognises that the availability of resources to cope with stressful situations is closely associated with socially patterned emotions, the distribution of power and control, various forms of discrimination and the fairness of society (Brunner, 2007), and psychosocial factors seem to attenuate health inequalities in Western countries (Marmot, Bosma, Hemingway, Brunner, & Stansfeld, 1997; Power, Matthews, & Manor, 1998; Wen, Hawkey, & Cacioppo, 2006). Social relational factors such as marital status and living alone are important determinants of health (Holt-Lunstad, Smith, & Layton, 2010), and socioeconomic variation in marital status has been reported (Fieder, Huber, & Bookstein, 2011).

In Japan, although there are many studies of factors linking SEP and health, to the best of our knowledge, none of these studies have explicitly tested all four dimensions of mechanisms simultaneously or calculated the extent of the attenuation in health inequalities by factors included. Health inequalities have most extensively examined in relation to education (Aida et al., 2011; Fujino, Iso, et al., 2005; Fujino, Tamakoshi, et al., 2005; Fujisawa, Hamano, & Takegawa, 2009; Hamano et al., 2010; Hirokawa, Tsutsumi, & Kayaba, 2006; Honjo, Tsutsumi, & Kayaba, 2010; Ichida et al., 2009; Ito et al., 2008; Iwasaki et al., 2002; Liang et al., 2002; Liang, Bennett, Sugisawa, Kobayashi, & Fukaya, 2003; Nishi et al., 2012; Wang et al., 2005) and, to a lesser extent, income (Liang et al., 2002, 2003; Oshio & Kobayash, 2009; Wang et al., 2005). Educational and income inequalities in health have been most consistently found in all-cause mortality and subjective health status, and these associations are attenuated somewhat by health behaviours, biomarkers, occupational factors and stress. The findings for occupation vary due to the differing occupational classifications employed (Hirokawa et al., 2006; Honjo et al., 2010; Ishizaki et al., 2006, 2001; Iwasaki et al., 2002; Sekine, Chandola, Martikainen, Marmot, & Kagamimori, 2006; Sekine, Chandola, Martikainen, Marmot, & Kagamimori, 2009; Sekine et al., 2011), but no study has used a theory-based occupational classification, which has the advantage of clarity when describing the dimension of inequality that was actually measured (Hiyoshi et al., 2013a). We consider that a study examining the four explanatory dimensions explicitly will contribute to advancing policy discussion for reducing health inequalities, which has just begun in Japan.

The aim of the present paper is to assess the contribution of material, psychosocial, social relational and behavioural factors on health inequalities for household social class and income in a working age population in Japan. We utilise social class and income as socioeconomic indicators as they may describe important aspects of health inequalities in Japan after substantial social changes occurred in the 1990s during which there appeared to be increases in job insecurity and income inequality. We calculate the attenuation that the four domains of candidate contributory factors have on social inequality in self-rated health.

## Methods

We analysed data from the Comprehensive Survey of Living Conditions [CSLC], a triennial survey that has been conducted since 1986. In particular, we used data from the 2001 CSLC as this was the only time that data on perceived stress and behaviours, including a detailed question on smoking, were collected. The CSLC employs multi-stage stratified random cluster sampling with the primary sampling unit being the census Enumeration Districts [EDs] which divide Japan into approximately one million areas. After stratifying by prefecture and large cities, 5000 EDs were randomly selected and all households and household members living in these areas were approached to complete a Demography & Health questionnaire. In addition, 2000 EDs were randomly selected from the 5000 EDs to complete an Income & Savings questionnaire, and we used this subset sample for our analyses. Response rates were 87.4% for the Demography & Health questionnaire in 2001, and 79.5% for the Income & Savings questionnaire, respectively (MHLW, 2009). Having excluded individuals with missing data in relevant variables, the sample size was  $n = 40,243$  (51.6% women). We tested mediating models  $\langle \text{SOCIOECONOMIC POSITION} \rangle \rightarrow \langle \text{CANDIDATE CONTRIBUTORY FACTORS} \rangle \rightarrow \text{SELF-RATED HEALTH}$  and calculated the extent to which income and social class inequalities in health were accounted for by 1) material, 2) psychosocial, 3) social relational, and 4) behavioural factors.

## Outcome

Self-rated health is used as the outcome. In various countries including Japan, the determinants of self-rated health appear to be similar (French et al., 2012), suggesting that the perception of self-rated health as a concept is not different for the Japanese from some Western countries. Self-rated health has been shown to be a strong predictor of all cause and cause specific mortality in many countries including Japan (Idler & Benyamini, 1997; Murata, Kondo, Tamakoshi, Yatsuya, & Toyoshima, 2006). In the present study, self-rated health was assessed from the single question: 'what is your current health (condition)?'. The five categories of response were: excellent, very good, good, fair, and poor. The variable was dichotomised, setting 'poor' and 'fair' responses as the outcome and expressed as 'suboptimal health' hereafter (Perlman & Bobak, 2008).

## Socioeconomic measures

We used the Japanese Socioeconomic Classification [J-SEC]. It adopted the conceptual basis of the UK's National Statistics Socioeconomic Classification [NS-SEC] (National Statistics, 2005), which differentiates the social position of individuals in terms of employment conditions and relations. In particular, J-SEC was based on the NS-SEC three category version since it is a hierarchical construct (National Statistics, 2005) which is suitable to be summarised using the relative index of inequality [RII] explained below. It was constructed using the Japanese Standard Classification of Occupation together with employment status (such as executives of companies, self-employed, employee, and limited term contract) and predicted economic and health differences for the Japanese population (Hiyoshi et al., 2013a). We used household social class, assigned by taking the highest social class value for any household member aged 15 or greater. Individuals who had missing data in variables used to derive J-SEC or lacked a household member having classifiable jobs were not assigned to a class ( $n = 7,192$ , 17.9%). Annual household income, including benefits and inheritance before tax, was equalised by dividing by the square root of household size. The study population was grouped into income

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