



Income inequality and health in China: A panel data analysis



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ABSTRACT

During the last decades, the level of income inequality in China has increased dramatically. Despite rapid economic growth and improved living conditions, the health performance in China has dropped compared to the period before the economic reform. The “Wilkinson hypothesis” suggests that increased income inequality in a society is correlated to worse health performance. China is a particular interesting case due to the rapid socioeconomic change in the country. This study uses the China Health and Nutrition Survey (CHNS) to address the question of whether income inequality has an impact on individuals' risks of having health problems in China. Unlike previous studies with health measures such as self-reported health or mortality rate, our study uses physical functions to measure individual health. By analysing panel data using county/city-level dummies and year fixed-effects, we found that income inequality does not have a significant impact on individuals' risks of having health problems. This result is robust when changing between different indicators for income inequality.

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1. Introduction

It is widely recognised that China has achieved great improvements in population health and public health, such as a dramatically lower mortality rate, increased life expectancy and extensive immunisation coverage (Chan et al., 2008). However, much of the improvements in health was achieved already before the economic reforms (Chan et al., 2008). Compared to the period before the economic reforms, China's improvement on health has slowed down, some health indicators have even dropped, and some new health problems have emerged. Given the rapid economic development over the last decades, with increased average income and improved living conditions, Chinese average life expectancy have not risen as much as one could expect (Lindelöw and Wagstaff, 2005; Liu, 2004; Tang et al., 2008). The number of HIV-infected people increases by 30 per cent each year; previously tamed tuberculosis and schistosomiasis are again spreading; the epidemic of SARS and avian influenza outbreak in the 2000s revealed the fundamental structural deficiencies of the Chinese healthcare system; and one third of the world's cigarettes were consumed in China (DRC, 2005; Pei and Rodriguez, 2006; WHO, 1999). In a national survey, Shi et al. (2008) showed that one third of the surveyed had some physical functional problems. They also observed comparatively high rates of unhealthy behaviours such as smoking

and alcohol abuse among Chinese nationals, and notably high occurrences of chronic diseases such as hypertension, heart disease, chronic pulmonary disease and diabetes.

Increasing health problems and increased income inequality have emerged during the economic reform period. Since the reform period began in 1978, the process of market reforms has led to increased social and economic inequality. The Gini coefficient has risen from between 0.2 and 0.3 in the 1970s (Chen and Zhou, 2005) to 0.47 in 2008 (NBSC, 2013), placing China on the same level of inequality as the United States.

This leads to the question of whether there is a connection between increased income inequality and higher risk for having health problems. A large body of literature has studied this relationship in other social contexts (Kondo et al., 2009; Lynch, Smith, Kaplan and House, 2000a; Subramanian and Kawachi, 2004; Wagstaff and van Doorslaer, 2000; Wilkinson and Pickett, 2006). The Wilkinson hypothesis suggests that societies with large income variations tend to have higher mortality and worse population health (Wilkinson, 1992, 1999; Wilkinson and Pickett, 2006). Empirical evidence in both international studies and studies in China are rather mixed.

Using panel data from the CHNS, this paper analyses the link between income inequality and individual health outcomes in China, and its contribution to the existing literature is threefold. First, where previous studies on health and inequality often measured health with self-reported health and mortality rate (Deaton, 2001; Gravelle, 1998; Kravdal, 2008; Lynch, Smith, Kaplan

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and House, 2000b; Zhao, 2006; Zimmer et al., 2007), this study includes objective individual physical indicators such as blood pressure, waist-to-hip ratio (WHR), mid-upper arm muscle circumference (MAMC) and overweightness. Second, the study uses a rich data set with the most recent wave from 2011. The data set makes it possible to track variations in income inequality within counties/cities over time. Furthermore, we include county/city-level and year fixed-effects, in order to control for time-constant, potentially confounding characteristics within counties/cities, as well as to capture variations in health that occur over time. Third, the Chinese context is particularly interesting due to the very rapid socioeconomic change in China over the last decades.

2. Theory and previous studies

The literature offers several theoretical contributions on the link between income inequality and health. The point of departure in this literature was initially the absolute individual income hypothesis. It states that health improves with higher individual income up to a certain point. When reaching that point, with additional rise in income, there are diminishing returns to health improvement. Earlier studies thus focused on absolute individual income having an important positive effect on health (Gravelle, 1998; Preston, 1975; Rodgers, 1979).

A central contribution to this field was made by Preston (1975), who found that redistribution of income will increase the health of the poor more than it harms the health of the rich, and thus improve average population health. He wrote: “the distribution of income is clearly a likely source of variance in the basic relation between national life expectancy and average national income” (Preston, 1975, p. 242). The idea that income inequality affects health directly, regardless of one’s position in the income distribution scale, was proposed by Wilkinson (1992). He suggested a psychosocial explanation for this effect: more egalitarian societies promote greater social integration, lower stress and better health for individuals, while more unequal societies promote harmful health behaviours such as smoking, eating comfort foods, and higher stress level (Cohen et al., 1997; Marmot et al., 1991; Wilkinson, 1996, 1999, 2000). Inequality makes social relations more stressful by increasing status differences and competition. Chronic stress is known to affect the cardiovascular and immune systems, and to lead to more rapid ageing and worse health (Wilkinson, 1996, 2006). The direct link between health and income inequality is widely debated and is today known as the income inequality hypothesis in health and epidemiological research.

Some critics of the hypothesis claim that the previous findings are statistical artefacts, and that the aggregate relation is due to an underlying concave relation between individual income and health (Deaton, 2003; Gravelle, 1998). Other criticisms concern the validity of the original findings (Deaton, 2003; Judge et al., 1998). Some scholars reviewing aggregated studies on the relation between income inequality and health concluded that there was little support for the income inequality-health hypothesis both within and between rich countries (Lynch et al., 2004). Others focused on the causal relationship between health and inequality. For example, studying Norwegian population censuses and various national population registers, Kravdal (2008) found that income inequality in municipalities had an adverse effect on mortality in the adult population, net of individual income. However, once other, unobserved characteristics of those municipalities were taken into account, findings were much more mixed.

Although there are scepticism about the relationship between income inequality and health, there is considerable support for the income inequality hypothesis. Reviewing literature within an epidemiological causal framework, Pickett and Wilkinson (2015)

found that 131 out of 155 reviewed peer-published reports supported the proposition that income inequality harms health. Kondo et al. (2009) have conducted a meta-analysis consisting of about 60 million subjects in 9 cohort studies and about 1.3 million subjects in 19 cross-sectional studies. They identified a “modest” impact, which indicated that potentially 1.5 million deaths could be averted in 30 OECD countries by reducing the Gini coefficient to below 0.3.

By reviewing multilevel studies which include both the micro individual income-health relation and the macro income inequality-population health link, Subramanian and Kawachi (2004) have observed the significance of geographic scale. Studies based on state-level units tend to identify the inequality-health relationship, where it is easier to identify the political mechanisms and contextual impacts. A similar discussion has been taken up by Wilkinson and Pickett (2006). They argued that one of the reasons for not finding evidence for the income inequality hypothesis is not using sufficiently large analytical units to capture the social class differences and salient social heterogeneity in a society. Accordingly, income inequality in smaller geographical units was more likely to be affected by the degree of residential segregation, and income differences within smaller neighbourhood matter much less. The health of people living in poor neighbourhoods could be explained by their marginal position in relation to wider society, instead of by income inequality within the poor neighbourhoods (Wilkinson, 1997; Wilkinson and Pickett, 2006).

This paper focuses on the relationship between income inequality and individual health risks in the context of China. We ask the following research questions: i) is the likelihood of having health problems correlated with higher income inequality in China, net of individual income and average income at the county level?; and ii) Does the relationship remain significant after controlling for observed individual-level factors, unobserved county/city factors, and year dummies? To explore these issues, we use a large Chinese panel data set with recent waves that allow us to compute measures of income inequality within each county/city at several time points. Gender differences in physical health measures are also taken into account. We aim to avoid confounding the relationship between income inequality and health with other time-constant characteristics of the county/city, as well as secular trends in health outcomes.

3. Income inequality and health in China

Following the process of market transition, many Chinese face greater challenges and pressure. The labour market has become more competitive, stressful and demanding; job situations are more insecure since the formerly lifelong employment in the state sectors has been reduced; family obligations lie more heavily on individuals because of the lack of welfare support. The tremendous changes inevitably influence people’s daily life, psychological condition, lifestyle, health-related behaviours, and are further embodied in their physical health outcomes (Shi et al., 2008; WHO, 2005 & DRC, 2005). Health-related behaviour and lifestyle changes such as nutrition, physical activities, smoking and alcohol have been recognised as important reasons for increased health problems (DRC, 2005; WHO, 1999).

There are relatively few empirical studies of the income inequality hypothesis from China, and the findings are mixed. By using CHNS 2006 data, Yang and Kanavos (2012) concluded that poorer people are less physically active and less likely to report their health as good or excellent. Using four waves of the same data set from 1991 to 2000, Li and Zhu (2006) found that self-rated health is positively associated with per capita income, and high inequality in a community increases the probability of harmful health-related behaviour. Furthermore, in places with higher

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