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## Retirement and health: Evidence from China

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## ABSTRACT

One typical feature of China's pension system is that retirement is mandatory. By exploiting the exogenous change created by this mandatory retirement policy, we use the mandatory retirement age as an instrument for retirement status to examine the effect of retirement on individual health using data from the *China Health and Nutrition Survey* (CHNS). Our main finding is that the probability of “fair” or “poor” self-reported health among white-collar workers decreases by 34 percentage point after retirement. This result is generally robust to different model specifications, alternative measures of health, and different subsamples. In addition, we deliver evidence that increased health-related exercises and the cultivation of a better lifestyle are two possible channels through which retirement affects health.

## 1. Introduction

China has witnessed a rapid demographic transition since the middle of the 20th century. This demographic transition, which quickly led to a dramatic aging of China's population, is the result of two fundamental forces: decreased fertility and an increase in life expectancy. China's one-child policy, which officially took effect in 1979, has dramatically lowered the overall fertility rate from 5.5% in 1970 to 1.7% in 2013. The consequence of this policy led to the decrease in the relative number of young people in the population. Meanwhile, because of improved nutrition, sanitation, and health care, life expectancy has been significantly prolonged in China, increasing from 41 years in 1949 to 75 years in 2013. Such demographic factors have determined that the population of China is aging at an extraordinarily rapid speed and on a large scale. Specifically, the proportion of elderly people (defined as those aged 65 years and above) in the Chinese population was 3.9% in 1970 and 8.9% in 2013. However, this proportion is expected to climb quickly, to 15.7% in 2030 and 22.6% in 2050 (United Nations, 2013). The rapid growth of the older population raises many problems in Chinese society. One of the prominent problems is a possible threat to the stability and sustainability of the current social pension system of China. As the population ages, there is a shrinking labor force contributing to the retirement income system but an increasing aged population eligible to receive a retirement pension. In response, a number of policy suggestions have encouraged raising the official retirement age (Han, 2014; Zhu, 2015). However, from the point of view of the whole society, whether such a policy should proceed depends on not only its direct impact on pension expenditure but also its indirect impact on other social expenditures, such as health care. More specifically, delayed retirement reduces pension expenditures, but if it also hurts retirees' health, health expenditures could increase commensurately, and as a result, overall government expenditures may not necessarily decrease. Therefore, the success of such policies in reducing total government expenditures will depend, in part, on the potential health impacts of delayed retirement.

There are several channels through which retirement could affect health. For example, it is possible that retirement releases workers from a stressful job, which would be beneficial to their health. However, it is also possible that retirement reduces

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individuals' social network and abates the social status inherent in their job. Consequently, retirement is stressful event and could be harmful to health. An expanding body of literature is dedicated to the causal effect of retirement on health along different dimensions, such as subjective or objective health, cognitive function, and subjective well-being. However, these studies focus solely on developed economies, and the empirical results are inconclusive. Specifically, using panel data from the Health and Retirement Study, [Neuman \(2008\)](#) finds that retirement preserves the individual's health for both men and women in the USA. This result is supported by the findings of [Johnston and Lee \(2009\)](#), [Coe and Zamarro \(2011\)](#), and [Insler \(2014\)](#). In contrast, using data from the English Longitudinal Study of Ageing (ELSA) and employing a propensity score-matching method, [Behncke \(2012\)](#) finds that retirement is a stressful event and that it is harmful to the individual's health. Similar results can be found in [Dave, Rashad, and Spasojevic \(2008\)](#). In addition, [Latif \(2012\)](#) reports that retirement actually has no overall effect on health using longitudinal data from the Canadian National Population Health Survey. In terms of retirement's effects on cognitive function, although there is evidence that retirement impairs the individual's mental health (e.g., [Bonsang, Adam, & Perelman, 2012](#); [Rohwedder & Willis, 2010](#)), other works indicate that the correlation between retirement and cognitive functioning is spurious (e.g., [Coe, Gaudecker, Lindeboom, & Maurer, 2012](#); [Coe & Zamarro, 2011](#)). Finally, with respect to the effect of retirement on subjective well-being, [Charles \(2004\)](#) emphasizes the positive impact of retirement on individual subjective well-being, while [Bonsang and Klein \(2012\)](#) suggest that retirement has no effect on subjective well-being.

The existing evidence regarding the impact of retirement on health is almost exclusively based on samples from developed countries; none of these studies provide evidence pertaining to developing countries or transitional economies. To fill this gap, this study provides the first direct evidence of the causal effect of retirement on health by utilizing large-scale, longitudinal, individual-level data from the *China Health and Nutrition Survey* (CHNS). In addition, we investigate several possible channels through which retirement could influence health.

Identifying the causal impact of retirement on health is not an easy job for the following reasons. First, it is possible that retirement and health are both determined by the individual's innate ability ([Bonsang et al., 2012](#)). Omitting proxies of a person's ability in the estimating equation could cause an upward bias in key estimates. Second, previous studies have shown that a person's health status is an important determinant of retirement ([Dwyer & Mitchell, 1999](#); [Quinn, 1977](#)). Therefore, a naïve ordinary least squares (OLS) estimation could mask the reverse causality problem. Lastly, retirement may be subject to measurement errors, which may bias our estimate of retirement downward.

To solve these problems and identify the causal effect of retirement on health, we follow [Coe and Zamarro \(2011\)](#) and use the instrumental variable approach to explore the potential impact of retirement on health. Specifically, in the present paper, we take advantage of the fact that the retirement age in China is mandated in the formal sectors, and an individual's retirement status is partially determined by this age threshold that is not related to the individual's health. We compare the health status of the retirees to the health status of those who are working by isolating the exogenous variation in retirement status using China's mandatory retirement age policy. Because there are no clear reasons to suspect that the health of individuals should change quickly around retirement age, any significant change in health found in the results could be attributed to the change in retirement status.

By applying this estimation framework to the CHNS data set and by controlling for other individual confounding factors, we find that mandatory retirement age significantly predicts workers' retirement status and that retirement has a positive effect on the health of white-collar male workers. More specifically, the estimate of retirement implies that retirement could reduce the probability that white-collar male workers will report "fair" or "poor" health by 0.34 point. Several robustness checks, including different unit fixed-effects models, alternative measures of individual health, different age polynomials, and different unit standard deviation (SD) clustering are conducted to ensure that these results are not driven by arbitrary specifications. In addition, we deliver evidence that increased health-related exercises and the cultivation of a better life style seem to be two possible channels through which retirement affects health.

Our paper is closely related to the contribution of [Lei, Li, and Zhao \(2010\)](#) in which they provide perhaps the first empirical investigation on the effect of China's mandatory retirement on workers' health. Using China 2005 1% population survey and exploiting the exogenous variation of retirement due to China's mandatory retirement policy, they show that retirement has a significant negative impact on male workers' health, but the impact disappears for those with college degree. They interpret this result as high education could help them smooth the retirement shock. Our work complements and differentiates from that of [Lei et al. \(2010\)](#) in the following aspects. First, white-collar workers generally have high education, which could help them reduce the negative impact of retirement on health, concurring with [Lei et al. \(2010\)](#). In addition, we take one step further to show that occupation also matters. Specifically, white-collar workers' jobs are more intellectually demanding, and the opportunity cost of adopting health-related activities, is relatively high. However, as the time cost of adopting health-related activities disappears after retirement, white-collar workers are more likely to adopt healthy behaviors since then and could help improve their health status. Second, we use different data sources. As a result, the health measures in the two papers are different. In addition, compared to China 2005 1% population survey, the CHNS contains much richer information on individual's health ([Luo, Mu, & Zhang, 2006](#)), which allows us to construct alternative health measures for robustness checks. Third, we investigate not only the effect of retirement on health but also the possible channels through which retirement could affect health.

The article proceeds as follows. [Section 2](#) introduces the mandatory retirement policy in China. [Section 3](#) outlines a conceptual framework. [Section 4](#) describes the data, variables, and descriptive statistics. [Section 5](#) discusses the identification strategy. [Section 6](#) presents the results. [Section 7](#) provides the conclusion.

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