

Lowry, Deborah and Albert Hermalin. 2010. "A Birth Cohort Analysis of Smoking in China and Its Implication." *PSC Research Report* No. 10-717. September 2010. <http://www.psc.isr.umich.edu/pubs/abs/6514>

Abstract: China has a long history of tobacco use dating from the late 16th century. Currently it is the world's largest consumer and producer of tobacco, with 350 million smokers accounting for 37% of the world cigarette production. This report focuses on the cigarette smoking behavior of cohorts born between 1908 and 1937, whose adult life spanned most of the 20th century, during which per capita consumption increased markedly. Collectively, these cohorts lived through very tumultuous times in China, traversing such major events as the Sino-Japanese war, the Second World War, the formation of the People's Republic of China, the Great Famine, and the Cultural Revolution. The cohort patterns of initiation, cessation, and use provide a first approximation of whether coming-of-age under sharply different conditions affected smoking behavior. The ability to subdivide the cohorts by gender, region, and education also allows one to explore several anomalies in the Chinese pattern of smoking. In particular, it provides a clear picture of the unusual age pattern of female smoking.

Hermalin, Albert and Deborah Lowry. 2010. "The Age Prevalence of Smoking among Chinese Women: A Case of Arrested Diffusion?" *PSC Research Report* No. 10-718. September 2010. <http://www.psc.isr.umich.edu/pubs/abs/6687>

Abstract: The smoking prevalence by age of women in China is distinct from most other countries in showing more frequent smoking among older women than younger. Using newly developed birth cohort histories of smoking, the authors demonstrate that although over one quarter of women born 1908-1912 smoked, levels of smoking declined across successive cohorts. This occurred despite high rates of smoking by men and the wide availability of cigarettes. The analysis shows how this pattern is counter to that predicted by the leading theoretical perspectives on the diffusion of smoking and discusses how it arose out of the special culture of gender relations in China, rather than from particular socioeconomic or political events. That a similar pattern of smoking is evident in Japan and Korea, two countries with strong cultural affinities to China, is used to buttress the argument.

Zeng, Yi, Danan Gu, Jama Purser, Helen Hoenig, and Nicholas Christakis. 2010. "Associations of Environmental Factors with Elderly Health and Mortality in China". *American Journal of Public Health* 100(2): 298-305.

Objectives: We examined the effects of community socioeconomic conditions, air pollution, and the physical environment on elderly health and survival in China. **Methods:** We analyzed data from a nationally representative sample of 15973 elderly residents of 866 counties and cities with multilevel logistic regression models in which individuals were nested within each county or city. **Results:** After control for individual-level factors,

communities' gross domestic product per capita, adult labor force participation rate, and illiteracy rate were significantly associated with physical, mental, and overall health and mortality among the elderly in China. We also found that air pollution increased the odds of disability in activities of daily living (ADLs), cognitive impairment, and health deficits; more rainfall was protective, reducing the odds of ADL disability and cognitive impairment; low seasonal temperatures increased the odds of ADL disability and mortality; high seasonal temperatures increased the odds of cognitive impairment and deficits; and living in hilly areas decreased the odds of ADL disability and health deficits. **Conclusions:** Efforts to reduce pollution and improve socioeconomic conditions could significantly improve elderly health and survival.

Gu, Danan, Jessica Sautter, Robin Pipkin, and Yi Zeng. 2010. "Sociodemographic and Health Correlates of Sleep Quality and Duration among Very Old Chinese. *SLEEP*, 33(5): 601-610.

Study Objectives: To examine factors associated with self-reported sleep quality and duration among very old adults in China. **Design:** Cross-sectional analysis of the 2005 wave of the Chinese Longitudinal Healthy Longevity Survey (CLHLS). **Setting:** In-home interview with older adults in 22 provinces in mainland China. **Participants:** A total of 15,638 individuals aged 65 and older (5,047 aged 65-79, 3,870 aged 80-89, 3,927 aged 90-99, and 2,794 aged 100 and older, including 6,688 men and 8,950 women). **Interventions:** N/A. **Measurements and Results:** Two self-reported sleep questions together with numerous sociodemographic and health status measures were used in this study. Sixty-five per cent of Chinese elders reported good quality of sleep. The average number of self-reported hours of sleep was 7.5 (SD 1.9), with 13.1%, 16.2%, 18.0%, 28.0%, 9.2%, and 15.5% reporting ≤ 5 , 6, 7, 8, 9, and ≥ 10 hours, respectively (weighted). Multivariate analyses showed that male gender, rural residence, Han ethnicity, higher socioeconomic status, and good health conditions were positively associated with good quality of sleep. All other factors being equal, octogenarians, nonagenarians, and centenarians were more likely to have good sleep quality than the young elders aged 65-79. Elders with poorer health status or older age were more likely to have either relatively shorter (≤ 6 h) or longer (≥ 10 h) sleep duration. Married elders were more likely to have an average duration between these two values. Except for some geographic variations, associations between all other factors and sleep duration were weak compared to the effects of health. **Conclusions:** Age and health conditions are the two most important factors associated with self-reported sleep quality and duration. Good quality of sleep among long-lived old adults may have some implications for achieving healthy longevity.

Shen, Ke. and Yi Zeng (2010). "The Association between Resilience and Survival among Chinese Elderly." *Demographic Research* 23(5) 105-116. oi:10.4054/DemRes.2010.23.5 (July 16, 2010).

Abstract: Based on the unique longitudinal data of the elderly aged 65+ with a sufficiently large sub-sample of the oldest-old aged 85+ from the Chinese Longitudinal Healthy Longevity Survey, we construct a resilience scale with 7 indicators for the

Chinese elderly, based on the framework of the Connor-Davidson Resilience Scale. Cox proportional hazards regression model estimates show that, after controlling for socio-demographic characteristics and initial health status, the total resilience score and most factors of the resilience scale are significantly associated with reduced mortality risk among the young-old and oldest-old. Although the causal mechanisms remain to be investigated, effective measures to promote resilience are likely to have a positive effect on longevity of the elderly in China.

Feng, Qiushi, Helen Hoenig, Danan Gu, Yi Zeng, and Jama Purser. 2010. "Impact of New Disability Subtypes on Three-year Mortality in Chinese Older Adults." *Journal of American Geriatrics Society* 58(10):1952-8.

Abstract: OBJECTIVES: To examine a new method for classifying disability subtypes by combining self-reported and performance-based tools to predict mortality in Chinese older adults. DESIGN: Prospective cohort study. SETTING: Community-dwelling old adults. PARTICIPANTS: 16,020 Chinese adults over age 65 from the Chinese Longitudinal Healthy Longevity Survey (CLHLS). MEASUREMENTS: Self-reported Basic Activities of Daily Living (ADLs) and physical performance (PP) tests (chair standing, lifting a book from floor, turning 360 degrees) cross-classified to create mutually exclusive disability subtypes: subtype 0 (no limitations in PP or ADL), subtype 1 (limitations in PP, no limitations in ADL), subtype 2 (no limitations in PP, limitations in ADL), and subtype 3 (limitations in both PP and ADL). Outcome was mortality over three years. RESULTS: Cox proportional hazard models, controlling for sociodemographics, living situation, healthcare access, social support, health status, and life style, showed that older adults without any limitations in ADL or PP had significantly lower mortality risk than those with other disability subtypes, and that there was a graded pattern of increased mortality according to subtypes 1, 2, and 3 (hazard ratios = 1.31 [1.20, 1.42], 1.39 [1.23, 1.59], and 1.88 [1.72, 2.05], respectively). When compared with the average survival curve in the cohort, subtypes of isolated performance deficits or self-reported disability did not substantially discriminate risks of death over three years. CONCLUSIONS: Combined use of self-reported and physical performance tools is necessary when screening for mutually exclusive disability subtypes that confer significantly elevated or decreased mortality risks to a population of older adults.

Gu, Danan, Matthew E. Dupre, David F. Warner, and Yi Zeng. 2009. "Changing Health Status and Health Expectancies among Older Adults in China: Gender Differences from 1992 to 2002". *Social Science & Medicine* 68: 2170–2179.

Abstract: Numerous studies document improvements in health status and health expectancies among older adults over time. However, most evidence is from developed nations and gender differences in health trends are often inconsistent. It remains unknown

whether changes in health in developing countries resemble Western trends or whether patterns of health improvement are unique to the country's epidemiologic transition and gender norms. Using two nationally representative samples of non-institutionalized adults in China aged 65 years and older, this study investigates gender differences in the improvements in disability, chronic disease prevalence, and self-rated health from 1992 to 2002. Results from multivariate logistic regression models show that all three indicators of health improved over the 10-year period, with the largest improvement in self-rated health. With the exception of disability, the health of women improved more than men. Using Sullivan's decomposition methods, we also show that active life expectancy, disease-free life expectancy, and healthy life expectancy increased over this decade and were patterned differently according to gender. Overall, the findings demonstrate that China experienced broad health improvements during its early stages of the epidemiologic transition and that these changes were not uniform by gender. We discuss the public health implications of the findings in the context of China's rapidly aging population.

Zeng, Yi, Cheng, L., Chen, H., Cao, H., Hauser, E., Liu, Y., Xiao, Z., Tan, Q., Tian, X., Vaupel, J.W. (2010). Effects of FOXO Genotypes on Longevity: A Bio-demographic Analysis. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, 2010; doi: 10.1093/gerona/glq156 (for online publication); the printed version of the Journal is in press.

Abstract: Based on data from 760 centenarians and 1060 middle-age controls (all Han Chinese), this article contributes biodemographic insights and syntheses concerning the magnitude of effects of the *FOXO* genotypes on longevity. We also estimate independent and joint effects of the genotypes of *FOXO1A* and *FOXO3A* genes on long-term survival, considering carrying or not-carrying the minor allele of the single-nucleotide polymorphism of another relevant gene. We found substantial gender differences in the independent effects; positive effects of *FOXO3A* and negative effects of *FOXO1A* largely compensate each other if one carries both, although *FOXO3A* has a stronger impact. Ten-year follow-up cohort analysis shows that at very advanced ages 92–110, adjusted for various confounders, positive effects of *FOXO3A* on survival remain statistically significant, but no significant effects of *FOXO1A* alone; $G \times G$ interactions between *FOXO1A*-209 and *FOXO3A*-310 or *FOXO3A*-292 decrease survival likelihood by 32%–36% ($p < .05$); $G \times E$ interactions between *FOXO1A*-209 and regular exercise increase survival likelihood by 31%–32% ($p < .05$).

Zeng, Yi, Gu, Danan, and George, Linda. 2010. "Religious participation and mortality among older Chinese adults". *Research on Aging* (in press)

Abstract: This research examines the association of religious participation with mortality using a longitudinal dataset collected from 9,017 oldest-old aged 85+ and 6,956 younger elders aged 65-84 in China in 2002 and 2005. Results show that, adjusted for demographic characteristics and family/social support and health practices, the risk of

dying was 24 percent ($p < 0.001$) and 12 percent ($p < 0.01$) lower among frequent and infrequent religious participants than among non-participants for all elders. After baseline health was adjusted, the corresponding risk of dying declined to 21 percent ($p < 0.001$) and 6 percent (not significant), respectively. Hazard model analyses comparing men and women and younger-old and oldest-old, respectively, show that gender differentials in the effects of religious participation on mortality among all elderly aged 65+ were not significant. However, this association among younger-old men was significantly stronger than among oldest-old men, while age differentials among women were not significant.

Yang Li, Wen-Jing Wang, Huiqing Cao, Jiehua Lu, Chong Wu, Fang-Yuan Hu, Jian Guo, Ling Zhao, Fan Yang, Yi-Xin Zhang, Wei Li, Gu-Yan Zheng, Hanbin Cui, Xiaomin Chen, Zhiming Zhu, Hongbo He, Birong Dong, Xianming Mo, Yi Zeng, and Xiao-Li Tian. 2009. "Genetic association of FOXO1A and FOXO3A with longevity trait in Han Chinese populations". *Human Molecular Genetics* 18(24): 4897–4904.

Abstract: FOXO1A and FOXO3A are two members of the FoxO family. FOXO3A has recently been linked to human longevity in Japanese, German and Italian populations. Here we tested the genetic contribution of FOXO1A and FOXO3A to the longevity phenotype in Han Chinese population. Six tagging SNPs from FOXO1A and FOXO3A were selected and genotyped in 1817 centenarians and younger individuals. Two SNPs of FOXO1A were found to be associated with longevity in women ($P \leq 0.01$ – 0.005), whereas all three SNPs of FOXO3A were associated with longevity in both genders ($P \leq 0.005$ – 0.001). One SNP from FOXO1A was found not to be associated with longevity. In haplotype association tests, the OR (95% CI) for haplotypes TTG and CCG of FOXO1A in association with female longevity were 0.72 (0.58–0.90) and 1.38 (1.08–1.76), $P \leq 0.0033$ and 0.0063 , respectively. The haplotypes of FOXO3A were associated with longevity in men [GTC: OR (95% CI) ≤ 0.67 (0.51–0.86), $P \leq 0.0014$; CGT: OR (95% CI) ≤ 1.48 (1.12–1.94), $P \leq 0.0035$] and in women [GTC: OR (95% CI) ≤ 0.75 (0.60–0.94), $P \leq 0.0094$; CGT: OR (95% CI) ≤ 1.47 (1.16–1.86), $P \leq 0.0009$]. The haplotype association tests were validated by permutation analysis. The association of FOXO1A with female longevity was replicated in 700 centenarians and younger individuals that were sampled geographically different from the original population. Thus, we demonstrate that, unlike FOXO3A, FOXO1A is more closely associated with human female longevity, suggesting that the genetic contribution to longevity trait may be affected by genders.