

## RESEARCH TWITTER

Li-Qun Fang, Li-Ping Wang, Sake J. de Vlas, Song Liang, Shi-Lu Tong, Yan-Li Li, Ya-Pin Li, Quan Qian, Hong Yang, Mai-Geng Zhou, Xiao-Feng Wang, Jan Hendrik Richardus, Jia-Qi Ma, and Wu-Chun Cao. **"Distribution and Risk Factors of 2009 Pandemic Influenza A (H1N1) in Mainland China."** *American Journal of Epidemiology*, 2012, 175(9): 890-97.

Data from all reported cases of 2009 pandemic influenza A (H1N1) were obtained from the China Information System for Disease Control and Prevention. The spatiotemporal distribution patterns of cases were characterized through spatial analysis. The impact of travel-related risk factors on invasion of the disease was analyzed using survival analysis, and climatic factors related to local transmission were identified using multilevel Poisson regression, both at the county level. The results showed that the epidemic spanned a large geographic area, with the most affected areas being in western China. Significant differences in incidence were found among age groups, with incidences peaking in school-age children. Overall, the epidemic spread from southeast to northwest. Proximity to airports and being intersected by national highways or freeways but not railways were variables associated with the presence of the disease in a county. Lower temperature and lower relative humidity were the climatic factors facilitating local transmission after correction for the effects of school summer vacation and public holidays, as well as population density and the density of medical facilities. These findings indicate that interventions focused on domestic travel, population density, and climatic factors could play a role in mitigating the public health impact of future influenza pandemics.

Renjie Chen, Haidong Kan\*, Bingheng Chen, Wei Huang, Zhipeng Bai, Guixiang Song, and Guowei Pan, on Behalf of the CAPES Collaborative Group. **"Association of Particulate Air Pollution With Daily Mortality: The China Air Pollution and Health Effects Study."** *American Journal of Epidemiology*, 2012, 175(11): 1173-81.

The study objective was to examine the association of particulate matter with an aerodynamic diameter of less than 10  $\mu\text{m}$  (PM10) with daily mortality in 16 Chinese cities between 1996 and 2008. Two-stage Bayesian hierarchical models were applied to obtain city-specific and national average estimates. Poisson regression models incorporating natural spline smoothing functions were used to adjust for long-term and seasonal trends of mortality, as well as other time-varying covariates. The averaged daily concentrations of PM10 in the 16 Chinese cities ranged from 52  $\mu\text{g}/\text{m}^3$  to 156  $\mu\text{g}/\text{m}^3$ . The 16-city combined analysis showed significant associations of PM10 with mortality: A 10- $\mu\text{g}/\text{m}^3$  increase in 2-day moving-average PM10 was associated with a 0.35% (95% posterior interval (PI): 0.18, 0.52) increase of total mortality, 0.44% (95% PI: 0.23, 0.64) increase of cardiovascular mortality, and 0.56% (95% PI: 0.31, 0.81) increase of respiratory mortality. Females, older people, and residents with low educational attainment appeared to be more vulnerable to PM10 exposure. Conclusively, this largest epidemiologic study of particulate air pollution in China suggests that short-term exposure to PM10 is associated with increased mortality risk.

Li Qin, Ronald P. Stolk, and Eva Corpeleijn. **"Motorized Transportation, Social Status, and Adiposity: The China Health and Nutrition Survey."** *American Journal of Preventive Medicine*, 2012, 43(1): 1-10.

This study examines the hypotheses that increased dependence on motorized transportation is related to adiposity and that this effect will be more pronounced in adults with high SES or those who live in urban regions. Data from the longitudinal China Health and Nutrition Survey conducted from 1997 to 2006 were used to examine the association between motorized transportation and changes in body weight and waist circumference (WC) by using multivariate regression. The results showed that use of motorized transportation for >5 years was related to ~1.2 kg greater weight gain and ~1.0 cm larger WC gain in men, when compared with the nonmotorized transportation group and adjusted for baseline age, anthropometry, dietary intake, and follow-up time. These changes

were slightly more pronounced in men with higher income or from rural areas, but the difference was not significant. In women, the tendency to have motorized transportation with weight gain was less pronounced. Low education and high income were the most predominant factors. In 2006, motorized transportation was associated with a 1.3-fold higher OR for obesity and abdominal obesity in men, and a 2-fold higher OR of obesity in women.

Tiejun Zhang, Jinling Zhang, Meiyang Gao, Na He, and Roger Detels. **"Knowledge, Attitudes and Practices of Voluntary HIV Counselling and Testing among Rural Migrants in Central China: a Cross-Sectional Study."** *European Journal of Public Health*, 2012, 22(2): 192-7.

This study aimed to document knowledge, attitudes and practices of voluntary HIV counselling and testing (VCT) among rural migrants in central China. A cross-sectional study with face-to-face anonymous questionnaire interviews was conducted. Among 1280 participants, 87.9% reported having had sexual intercourse during their lifetime, with 69% of singles reporting having had sexual intercourse and 49.1% having had sex in the past month. Only 21% always used condoms, 84.4% knew HIV infection was diagnosed through blood testing, 56.6% had heard of VCT, but only 3.8% perceived their own risk for HIV infection. Only 43 (2.3%) had ever been tested for HIV, and none had ever been tested at a VCT site. About two-thirds would be willing to use VCT services upon awareness of HIV risk. A logistic regression model showed that females, those having little knowledge of HIV/AIDS, those unwilling to work with HIV-infected individuals, never having been tested for HIV and having low awareness regarding HIV risk were less willing to use VCT. The results of this study indicated that much greater efforts are needed to improve HIV/AIDS and VCT knowledge, to promote safer sex and to improve VCT acceptance among rural migrants in central China, particularly those engaging in risky behaviours.

Kaili Wang, Hongmei Yan, Yanlin Liu, Zhiwei Leng, Binyou Wang, and Jinkou Zhao. **"Increasing Prevalence of HIV and Syphilis But Decreasing Rate of Self-Reported Unprotected Anal Intercourse among Men Who Had Sex with Men in Harbin, China: Results of Five Consecutive Surveys from 2006 to 2010."** *International Journal of Epidemiology*, 2012, 41(2): 423-32.

To monitor the prevalence of HIV and syphilis as well as behaviours, a sentinel site for men who have sex with men was established in Harbin in 2002. Behavioural and serological data collected in five consecutive cross-sectional surveys were analysed. The prevalence of HIV and syphilis increased from 1.0% in 2006 to 7.5% in 2010 and from 9.2% in 2006 to 22.4% in 2009, respectively, whereas the rate of unprotected anal intercourse decreased from 61.3% in 2006 to 47.1% in 2010. Syphilis positivity and HIV infection are independently associated with each other across years. The rate of unprotected anal sex remains high although it has decreased over the years. Findings support an increasing prevalence of HIV and syphilis among men who have sex with men in Harbin. Targeted behavioural intervention and syphilis treatment are urgently needed to prevent the epidemic from growing.

Zhengming Chen, Gonghuan Yang, Alison Offer, Maigeng Zhou, Margaret Smith, Richard Peto, Hui Ge, Ling Yang, and Gary Whitlock. **"Body Mass Index and Mortality in China: a 15-year Prospective Study of 220 000 Men."** *International Journal of Epidemiology*, 2012, 41(2): 472-81.

This paper employed a prospective cohort study of 224 064 men, of whom 40 700 died during follow-up between 1990-91 and 2006. Analyses were restricted to 142 214 men aged 40-79 years at baseline with no disease history and, to further reduce bias from pre-existing disease, at least 5 years of subsequent follow-up were included, leaving 17 800 deaths [including 4165 stroke, 1297 coronary heart disease (CHD), 3121 chronic obstructive pulmonary disease (COPD)]. Adjusted hazard ratios (HRs) and 95% confidence intervals (95% CIs) per 5 kg/m<sup>2</sup> were calculated within either a lower (15 to <23.5 kg/m<sup>2</sup>) or higher (23.5 to <35 kg/m<sup>2</sup>) range. The association between BMI and all-cause mortality was U-shaped with the lowest mortality at 22.5-25 kg/m<sup>2</sup>. In the lower range, 5 kg/m<sup>2</sup> higher BMI was associated with 14% lower mortality (HR 0.86, 95% CI 0.82-0.91); in the upper

range, it was associated with 27% higher mortality (HR 1.27, 95% CI 1.15–1.40). The absolute excess mortality in the lower range was largely accounted for by excess mortality from specific smoking-related diseases: 54% by that for COPD, 12% other respiratory disease, 13% lung cancer, 11% stomach cancer. The excess mortality in the upper BMI range was largely accounted for by excess mortality from specific vascular diseases: 55% by that for stroke, 16% CHD. In this range, 5 kg/m<sup>2</sup> higher BMI was associated with ~50% higher mortality from stroke (HR 1.61, 95% CI 1.36–1.92) and CHD (HR 1.48, 95% CI 1.12–1.95).

Yuqin Ma, Lulu Zhang, and Qian Chen. **“China’s New Cooperative Medical Scheme For Rural Residents: Popularity Of Broad Coverage Poses Challenges For Costs.”** *Health Affairs*, 2012, 31:1058-64;

One of the components in China’s massive health reform effort is the New Cooperative Medical Scheme. This program offers three options with different benefits and costs to county health officials, who select one of the options to make available to local residents. Data were obtained from the New Cooperative Medical Scheme survey conducted by the Chinese Ministry of Health and the World Bank in 2005, which covered more than 47,000 people living in twenty-seven counties, to determine participation levels, identify which option was most attractive, and characterize the impact that each option had on care and costs. This study found that those participants with the most limited coverage might have delayed seeking care, while the broadest coverage—the “Cadillac option”—was the most popular. Yet if this generous package were to be broadly offered, health costs would become unsustainable. Therefore, the Chinese government must consider which costs to cover for people in economically depressed rural areas.

Kimberly S. Babiarz, Grant Miller, Hongmei Yi, Linxiu Zhang, and Scott Rozelle. **“China’s New Cooperative Medical Scheme Improved Finances of Township Health Centers But Not The Number of Patients Served.”** *Health Affairs*, 2012, 31:1065-74.

This article reported findings from a longitudinal study of how China’s New Cooperative Medical Scheme affected the use of health care services, out-of-pocket spending on medical care, and the operations and financial viability of China’s township health centers. It found that between 2005 and 2008 the program provided some risk protection and increased the intensity of inpatient care at township health centers. Importantly, the program appeared to have improved the centers’ financial status. At the same time, the program did not increase the overall number of patients served or the likelihood that a sick person would seek care at a township center. These findings served as a benchmark of the program’s early impact. The results also suggested that the composition of health care use in China had changed, with people increasingly seeking outpatient care at village clinics and inpatient care at township health centers.

Yongbin Li, Jing Xu, Fang Wang, Bin Wang, Liqun Liu, Wanli Hou, Hong Fan, Yeqing Tong, Juan Zhang, and Zuxun Lu. **“Overprescribing In China, Driven By Financial Incentives, Results in Very High Use of Antibiotics, Injections, and Corticosteroids.”** *Health Affairs*, 2012, 31:1075-82.

Inappropriate prescribing is a global problem. It is especially salient in China, where drug sales constitute a major portion of health care providers’ incomes, price distortions are rampant, and oversight is lax. However, few data exist on the prevalence of inappropriate prescribing in China. This study, the first of its kind in China, examined 230,800 prescriptions written between 2007 and 2009 by 784 community health institutions in 28 cities across China. The data show substantial overprescribing, including twice as many prescriptions for antibiotics as recommended by the World Health Organization and rates of injection that are three times higher than in similar countries. These findings point to the need to integrate rational prescribing into China’s ongoing health care reform.

Yanlin Zhao, Shaofa Xu, Lixia Wang, Daniel P. Chin, Shengfen Wang, Ph.D., Guanglu Jiang, Hui Xia, Yang Zhou, Qiang Li, Xichao Ou, Yu Pang, Yuanyuan Song, Bing Zhao, Hongtao Zhang, Guangxue He, Jing Guo, and Yu Wang. "**National Survey of Drug-Resistant Tuberculosis in China.**" *New England Journal of Medicine*, 2012, 366: 2161-70.

The authors carried out a national survey of drug-resistant tuberculosis in China in 2007. They estimated the proportion of tuberculosis cases in China that were resistant to drugs by means of cluster-randomized sampling of tuberculosis cases in the public health system and testing for resistance to the first-line antituberculosis drugs and the second-line drugs. They used the results from the survey and published estimates of the incidence of tuberculosis to estimate the incidence of drug-resistant tuberculosis. The authors found that among 3037 patients with new cases of tuberculosis and 892 with previously treated cases, 5.7% and 25.6%, respectively, had multidrug-resistant (MDR) tuberculosis. Among all patients with tuberculosis, approximately 1 of 4 had disease that was resistant to isoniazid, rifampin, or both, and 1 of 10 had MDR tuberculosis. Approximately 8% of the patients with MDR tuberculosis had extensively drug-resistant (XDR) tuberculosis. In 2007, there were 110,000 incident cases of MDR tuberculosis and 8200 incident cases of XDR tuberculosis. Most cases of MDR and XDR tuberculosis resulted from primary transmission. Patients with multiple previous treatments who had received their last treatment in a tuberculosis hospital had the highest risk of MDR tuberculosis (adjusted odds ratio, 13.3; 95% CI, 3.9 to 46.0). Among 226 previously treated patients with MDR tuberculosis, 43.8% had not completed their last treatment; most had been treated in the hospital system. Among those who had completed treatment, tuberculosis developed again in most of the patients after their treatment in the public health system. The authors concluded that China has a serious epidemic of drug-resistant tuberculosis. MDR tuberculosis is linked to inadequate treatment in both the public health system and the hospital system, especially tuberculosis hospitals; however, primary transmission accounts for most cases.