

## RESEARCH TWITTER

Shua J. Chai, Feng Tan, Yongcai Ji, Xiaomin Wei, Richun Li, and Melinda Frost. **"Community-Level Text Messaging for 2009 H1N1 Prevention in China."** *American Journal of Preventive Medicine*, 2013, 45: 190-6.

This study aims to determine the effectiveness of mobile phone text messaging (SMS) in improving 2009 H1N1 knowledge, attitudes, behaviors, and self-reported outcomes and to assess community SMS acceptability. A program evaluation of Shanghai, China's SMS system using a single-blinded, randomized-controlled method was conducted in 2010. Randomly selected community residents who agreed to participate were assigned to receive 3 weeks of either 2009 H1N1 prevention and control or tobacco-cessation messages. It finds that of 1992 respondents, those receiving 2009 H1N1 messages had higher scores measuring 2009 H1N1 knowledge and desired attitudes ( $p < 0.001$ ); 1.77 times greater odds of new 2009 H1N1 vaccination ( $p < 0.001$ ); and 0.12 times smaller odds of reporting influenza-like illness ( $p < 0.001$ ) than those receiving tobacco messages. This study concludes that SMS can improve self-reported uptake of short-term behaviors, such as vaccination, that can result in long-term prevention and control of disease. SMS can improve knowledge and influence attitudes about infection prevention and control and self-reported health outcomes.

Xian Qi, Yan-Hua Qian, Chang-Jun Bao, Xi-Ling Guo, Lun-Biao Cui, Fen-Yang Tang, Hong Ji, Yong Huang, Pei-Quan Cai, Bing Lu, Ke Xu, Chao Shi, Feng-Cai Zhu, Ming Hao Zhou, and Hua Wang. **"Probable person to person transmission of novel avian influenza A (H7N9) virus in Eastern China, 2013: epidemiological investigation."** *BMJ*, 2013, 347 doi: <http://dx.doi.org/10.1136/bmj.f4752>.

This study aimed to determine whether the novel avian influenza H7N9 virus can transmit from person to person and its efficiency. Samples from the two patients with avian H7N9 in Wuxi, China in March 2013 and environments were collected and tested by real time reverse transcriptase-polymerase chain reaction (rRT-PCR), viral culture, and haemagglutination inhibition assay. The index patient became ill five to six days after his last exposure to poultry. The second patient, his daughter aged 32, who provided unprotected bedside care in the hospital, had no known exposure to poultry. She developed symptoms six days after her last contact with her father. Two strains were isolated successfully from the two patients. Genome sequence and analyses of phylogenetic trees showed that both viruses were almost genetically identical. Forty three close contacts of both patients were identified. One had mild illness but had negative results for avian H7N9 by rRT-PCR. All 43 close contacts tested negative for haemagglutination inhibition antibodies specific for avian H7N9. This study concluded that the infection of the daughter probably resulted from contact with her father (the index patient) during unprotected exposure, suggesting that in this cluster the virus was able to transmit from person to person. The transmissibility was limited and non-sustainable.

Xiuxiu Zhao, Ping Yang, Ruoyan Gai, Lin Mei, Xingzhou Wang, and Lingzhong Xu. **"Determinants of health care-seeking delay among tuberculosis patients in Shandong Province, China."** *European Journal of Public Health*, Advance Access, 10.1093/eurpub/ckt113.

This study aimed to understand the situation of initial health care-seeking delay among tuberculosis patients in eastern China, and explore its influencing factors, to provide a basis for formulating related policies and reducing its transmission. A cross-sectional survey was conducted in six counties of Shandong Province, China and the study sites were selected by multi-stage random sampling. Subjects were pulmonary tuberculosis patients registered with the county tuberculosis dispensaries at study sites that completed treatment during the period October 2006 to September 30, 2007. For the 819 cases of pulmonary tuberculosis, the median initial health care-seeking delay time was 6 days, and 49.8% of them were initial health care-seeking delayed. The logistic regression analysis showed that marriage (odds ratio = 0.354, 95% CI: 0.193–0.650) and knowledge of the national

tuberculosis subsidy policy (odds ratio = 1.753, 95% CI: 1.258–2.441) were associated with initial health care-seeking delay. This study concluded that changing the perception of patients and popularizing the national tuberculosis subsidy policy would do well towards reducing initial health care-seeking delay.

Zhiyuan Hou, Ellen Van de Poel, Eddy Van Doorslaer, Baorong Yu, and Qingyue Meng. **Effects of NCMS on access to care and financial protection in China.** *Health Economics*, Early View, DOI: 10.1002/hec.2965.

The introduction of the New Cooperative Medical Scheme (NCMS) in rural China has been the most rapid and dramatic extension of health insurance coverage in the developing world in this millennium. The literature to date has mainly used the uneven rollout of NCMS across counties as a way of identifying its effects on access to care and financial protection. This study exploits the cross-county variation in NCMS generosity in 2006 and 2008 in the Ningxia and Shandong provinces to estimate the effect of coverage generosity on utilization and financial protection. The results confirm earlier findings of NCMS being effective in increasing access to care but not in increasing financial protection. In addition, this study finds NCMS enrollees to be sensitive to the price incentives set in the NCMS design when choosing their provider and providers to respond by increasing prices and/or providing more expensive care.

Lindsay M Jaacks, Penny Gordon-Larsen, Elizabeth J Mayer-Davis, Linda S Adair, and Barry Popkin. **“Age, Period and Cohort Effects on Adult Body Mass Index and Overweight from 1991 to 2009 in China: the China Health and Nutrition Survey.”** *International Journal of Epidemiology*, 2013, 42: 828-37.

The authors collected data from the China Health and Nutrition Survey from 1991 to 2009 which included 53,298 observations from 18,059 participants across nine provinces in China. They used mixed effects models to explicitly assess differences in body mass index (BMI) within individuals over time (age effect) and population-wide differences in BMI over time (period effect), and implicitly assess differences in the experienced period effect across individuals of varying ages (cohort effect). Stronger period effects on BMI and overweight were observed among males compared with females; and younger cohorts had higher BMIs compared with older cohorts. The authors concluded that although period effects had a stronger influence on the BMI of males, interventions should not overlook younger female cohorts who are at increased risk compared with their older counterparts.

Jiu-Yao Wang, Li-Fan Liu, Chuan-Yu Chen, Ya-Wen Huang, Chao A Hsiung, and Hui-Ju Tsai. **“Acetaminophen and/or antibiotic use in early life and the development of childhood allergic diseases.”** *International Journal of Epidemiology*, 2013, 42: 1087-99.

The authors conducted a prospective birth cohort study of 263,620 children born in 1998 and 9,910 children born in 2003, separately, from the National Health Insurance Research Database (NHIRD) in Taiwan. Exposure status of acetaminophen and/or antibiotics and potential confounding factors were included in the analyses. Cox proportional hazards models were applied to determine the temporal relationship between acetaminophen and/or antibiotic exposure and the development of allergic diseases. They observed a positive relationship between acetaminophen and/or antibiotic exposure during the 1st year of life and the subsequent development of the three examined allergic diseases (atopic dermatitis, asthma and allergic rhinitis) in the 1998 birth cohort, but the observed relationship of drug exposure in the 2003 cohort, especially for atopic dermatitis and asthma, was lower than for those in the 1998 cohort and was not statistically significant. The authors concluded that the temporal effect of exposure to acetaminophen and/or antibiotics influences the development of common allergic diseases in later childhood.

Zhongliang Zhou, Yanfang Su, Jianmin Gao, Benjamin Campbell, Zhengwei Zhu, Ling Xu, Yaoguang Zhang. **"Assessing equity of healthcare utilization in rural China: results from nationally representative surveys from 1993 to 2008."** *International Journal for Equity in Health*, 2013, 12:34.

The authors estimated need-predicted healthcare utilization of outpatient and inpatient services using the National Health Service Survey (NHSS) in 1993, 1998, 2003, and 2008. Need-standardized healthcare utilization is assessed through indirect standardization method. Concentration index is measured to reflect income-related inequity of healthcare utilization. They found that the concentration index of need-standardized outpatient utilization is 0.0486[95% CI (0.0399, 0.0574)], 0.0310[95% CI (0.0229, 0.0390)], 0.0167[95% CI (0.0069, 0.0264)] and -0.0108 [95% CI (-0.0213, -0.0004)] in 1993, 1998, 2003 and 2008, respectively. For inpatient service, the concentration index is 0.0529[95% CI (0.0349, 0.0709)], 0.1543[95% CI (0.1356, 0.1730)], 0.2325[95% CI (0.2132, 0.2518)] and 0.1313[95% CI (0.1174, 0.1451)] in 1993, 1998, 2003 and 2008, respectively. The authors concluded that utilization of both outpatient and inpatient services was pro-rich in rural China with the exception of outpatient service in 2008. With the same needs for healthcare, rich rural residents utilized more healthcare service than poor rural residents. Compared to utilization of outpatient service, utilization of inpatient service was more inequitable. Inequity of utilization of outpatient service reduced gradually from 1993 to 2008; meanwhile, inequity of inpatient service utilization increased dramatically from 1993 to 2003 and decreased significantly from 2003 to 2008.

Yu Xu, Limin Wang, Jiang He, Yufang Bi, Mian Li, Tiange Wang, Linhong Wang, Yong Jiang, Meng Dai, Jieli Lu, Min Xu, Yichong Li, Nan Hu, Jianhong Li, Shengquan Mi, Chung-Shiuan Chen, Guangwei Li, Yiming Mu, Jiajun Zhao, Lingzhi Kong, Jialun Chen, Shenghan Lai, Weiqing Wang, Wenhua Zhao, and Guang Ning. **"Prevalence and Control of Diabetes in Chinese Adults."** *JAMA*, 2013, 310: 948-959.

The authors conducted a cross-sectional survey in a nationally representative sample of 98,658 Chinese adults in 2010 using a complex, multistage, probability sampling design. Plasma glucose and hemoglobin A1c levels were measured after at least a 10-hour overnight fast among all study participants, and a 2-hour oral glucose tolerance test was conducted among participants without a self-reported history of diagnosed diabetes. They estimated that the overall prevalence of diabetes was 11.6% (95% CI, 11.3%-11.8%) in the Chinese adult population. The prevalence among men was 12.1% (95% CI, 11.7%-12.5%) and among women was 11.0% (95% CI, 10.7%-11.4%). The prevalence of previously diagnosed diabetes was estimated to be 3.5% (95% CI, 3.4%-3.6%) in the Chinese population: 3.6% (95% CI, 3.4%-3.8%) in men and 3.4% (95% CI, 3.2%-3.5%) in women. The prevalence of undiagnosed diabetes was 8.1% (95% CI, 7.9%-8.3%) in the Chinese population: 8.5% (95% CI, 8.2%-8.8%) in men and 7.7% (95% CI, 7.4%-8.0%) in women. In addition, the prevalence of prediabetes was estimated to be 50.1% (95% CI, 49.7%-50.6%) in Chinese adults: 52.1% (95% CI, 51.5%-52.7%) in men and 48.1% (95% CI, 47.6%-48.7%) in women. The prevalence of diabetes was higher in older age groups, in urban residents, and in persons living in economically developed regions. Among patients with diabetes, only 25.8% (95% CI, 24.9%-26.8%) received treatment for diabetes, and only 39.7% (95% CI, 37.6%-41.8%) of those treated had adequate glycemic control. The authors projected that there were up to 113.9 million Chinese adults with diabetes and 493.4 million with prediabetes. These findings indicate the importance of diabetes as a public health problem in China.

Gonghuan Yang, Yu Wang, Yixin Zeng, George F Gao, Xiaofeng Liang, Maigeng Zhou, Xia Wan, Shicheng Yu, Yuhong Jiang, Mohsen Naghavi, Theo Vos, Haidong Wang, Alan D Lopez, and Christopher JL Murray. **"Rapid health transition in China, 1990–2010: findings from the Global Burden of Disease Study 2010."** *The Lancet*, 2013, 381:1987-2015.

The authors used results of the Global Burden of Diseases, Injuries, and Risk Factors Study 2010 (GBD 2010) for 1990 and 2010 for China and 18 other countries in the G20 to assess rates and trends in mortality, causes of death, years of life lost (YLLs), years lived with disability (YLDs), disability-adjusted

life-years (DALYs), and healthy life expectancy (HALE). They presented results for 231 diseases and injuries and for 67 risk factors or clusters of risk factors relevant to China and assessed relative performance of China against G20 countries. They found that the leading causes of death in China in 2010 were stroke (1.7 million deaths, 95% uncertainty intervals (UI) 1.5 – 1.8 million), ischaemic heart disease (948,700 deaths, 774, 500 – 1,024,600), and chronic obstructive pulmonary disease (934,000 deaths, 846,600 – 1,032,300). Age-standardised YLLs in China were lower in 2010 than all emerging economies in the G20, and only slightly higher than noted in the USA. China had the lowest age-standardised YLD rate in the G20 in 2010. China also ranked tenth (95% UI eighth to tenth) for HALE and 12th (11th to 13th) for life expectancy. YLLs from neonatal causes, infectious diseases, and injuries in children declined substantially between 1990 and 2010. Mental and behavioural disorders, substance use disorders, and musculoskeletal disorders were responsible for almost half of all YLDs. The fraction of DALYs from YLDs rose from 28.1% (95% UI 24.2—32.5) in 1990 to 39.4% (34.9—43.8) in 2010. Leading causes of DALYs in 2010 were cardiovascular diseases (stroke and ischaemic heart disease), cancers (lung and liver cancer), low back pain, and depression. Dietary risk factors, high blood pressure, and tobacco exposure are the risk factors that constituted the largest number of attributable DALYs in China. Ambient air pollution ranked fourth (third to fifth; the second highest in the G20) and household air pollution ranked fifth (fourth to sixth; the third highest in the G20) in terms of the age-standardised DALY rate in 2010.

Kit Yee Chan, Wei Wang, Jing Jing Wu, Li Liu, Evropi Theodoratou, Josip Car, Lefkos Middleton, Tom C Russ, Ian J Deary, Harry Campbell, Wei Wang, and Igor Rudan. **"Epidemiology of Alzheimer's disease and other forms of dementia in China, 1990–2010: a systematic review and analysis."** *The Lancet*, 2013, 381: 2016-23.

The authors searched for reports of Alzheimer's disease or dementia in China, published in Chinese and English between 1990 and 2010 from the databases of National Knowledge Infrastructure, Wanfang, and PubMed. They found 12 642 reports, of which 89 met the inclusion criteria (75 assessed prevalence, 13 incidence, and nine mortality). In total, the included studies had 340,247 participants, in which 6357 cases of Alzheimer's disease were recorded. 254,367 people were assessed for other forms of dementia, of whom 3,543 had vascular dementia, frontotemporal dementia, or Lewy body dementia. In 1990 the prevalence of all forms of dementia was 1.8% (95% CI 0.0 – 44.4) at 65 – 69 years, and 42.1% (0.0 – 88.9) at age 95 – 99 years. In 2010 prevalence was 2.6% (0.0 – 28.2) at age 65 – 69 years and 60.5% (39.7 – 81.3) at age 95 – 99 years. The number of people with dementia in China was 3.68 million (95% CI 2.22 – 5.14) in 1990, 5.62 million (4.42 – 6.82) in 2000, and 9.19 million (5.92 – 12.48) in 2010. In the same period, the number of people with Alzheimer's disease was 1.93 million (1.15 – 2.71) in 1990, 3.71 million (2.84 – 4.58) people in 2000, and 5.69 million (3.85 – 7.53) in 2010. The incidence of dementia was 9.87 cases per 1000 person-years, that of Alzheimer's disease was 6.25 cases per 1000 person-years, that of vascular dementia was 2.42 cases per 1000 person-years, and that of other rare forms of dementia was 0.46 cases per 1000 person-years. They retrieved mortality data for 1,032 people with dementia and 20,157 healthy controls, who were followed up for 3 – 7 years. The median standardised mortality ratio was 1.94:1 (IQR 1.74 – 2.45). The authors concluded that the burden of dementia seems to be increasing faster than is generally assumed by the international health community. Rapid and effective government responses are needed to tackle dementia in low-income and middle-income countries.

Feng-Cai Zhu, Fan-Yue Meng, Jing-Xin Li, Xiu-Ling Li, Qun-Ying Mao, Hong Tao, Yun-Tao Zhang, Xin Yao, Kai Chu, Qing-Hua Chen, Yue-Mei Hu, Xing Wu, Pei Liu, Lin-Yang Zhu, Fan Gao, Hui Jin, Yi-Juan Chen, Yu-Ying Dong, Yong-Chun Liang, Nian-Min Shi, Heng-Ming Ge, Lin Liu, Sheng-Gen Chen, Xing Ai, Zhen-Yu Zhang, Yu-Guo Ji, Feng-Ji Luo, Xiao-Qin Chen, Ya Zhang, Li-Wen Zhu, Zheng-Lun Liang, and Xin-Liang Shen. **"Efficacy, safety, and immunology of an inactivated alum-adjuvant enterovirus 71 vaccine in children in China: a multicentre, randomised, double-blind, placebo-controlled, phase 3 trial."** *The Lancet*, 2013, 381: 2024-32.

The authors assessed the efficacy, safety, immunogenicity, antibody persistence, and immunological correlates of an inactivated alum-adjuvant enterovirus 71 (EV71) vaccine. They did a randomised, double-blind, placebo-controlled, phase 3 trial. Healthy children aged 6–35 months from four centres in China were randomly assigned (1:1) to receive vaccine or alum-adjuvant placebo at day 0 and 28, according to a randomisation list (block size 30) generated by an independent statistician. Investigators and participants and their guardians were masked to the assignment. Primary endpoints were EV71-associated hand, foot, and mouth disease (HFMD) and EV71-associated disease during the surveillance period from day 56 to month 14, analysed in the per-protocol population. 10,245 participants were enrolled and assigned: 5,120 to vaccine versus 5,125 to placebo. 4,907 (with three cases of EV71-associated HFMD and eight cases of EV71-associated disease) versus 4,939 (with 30 cases of EV71-associated HFMD and 41 cases of EV71-associated disease) were included in the primary efficacy analysis. Vaccine efficacy was 90.0% (95% CI 67.1 – 96.9) against EV71-associated HFMD ( $p=0.0001$ ) and 80.4% (95% CI 58.2 – 90.8) against EV71-associated disease ( $p<0.0001$ ). Serious adverse events were reported by 62 of 5,117 (1.2%) participants in the vaccine group versus 75 of 5,123 (1.5%) in the placebo group ( $p=0.27$ ). Adverse events occurred in 3,644 (71.2%) versus 3,603 (70.3%;  $p=0.33$ ). The authors believe that EV71 vaccine provides high efficacy, satisfactory safety, and sustained immunogenicity.