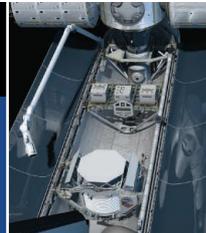


Plague risk
in China

559

Antimatter
probe delayed

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SOCIAL SCIENCE

Survey to Reveal True Face of Chinese Society

For decades, social scientists looking for figures from China were hamstrung. The Chinese government collects copious data, but much is secret, and what isn't classified is often unreliable. The imperfect solution, more often than not, has been for researchers to go knocking on doors themselves.

This approach changed this month as scores of interviewers dispersed across China for the start of a study that aims to document everything from emotional stress to family planning (see table). They expect to reach 60,000 respondents in 25 provinces—making the survey the largest undertaking of its kind in the developing world. “This is just mammoth compared to other studies,” says Robert Hauser, a demographer at the University of Wisconsin, Madison, who advised the survey's designers.

The Chinese Family Panel Studies, as the project is called, should provide abundant fodder for data-starved social scientists hoping to track how China's rapid development is shaping societal values, says Yu Xie, a sociologist at the University of Michigan, Ann Arbor, and Peking University who designed much of the new survey. Through this year's baseline survey and annual follow-up visits, he says, “we are going to be able to document some of the biggest changes in history.”

The \$8.8 million survey is broad as well as deep. Comparable U.S. efforts are often funded by government agencies seeking specific data, and as a result they home in on specific age groups or topics. The government-backed Chinese survey, by contrast, was crafted by scholars to fill myriad holes in social science data, meaning it will expand

the body of information on China in one fell swoop. To achieve that range, interviewers are questioning every member of each household they visit.

The survey's architects hope that the extensive interviews will help build a vivid portrait of Chinese society. And a design modeled after similar studies in the West means demographers and sociologists will be able to use the results to compare across cultures, says Hauser: “It will really improve the quality of data worldwide.”

Chinese family values

Not long ago, the Chinese government viewed most of the social sciences with suspicion. But by 2004, top leaders were bemoaning gaps in information as they sought to maintain social

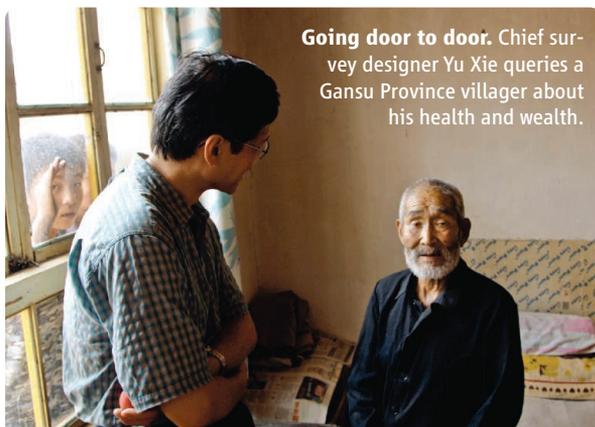
stability, sociologists say. With their university flush with research money, scholars from four Peking University departments convened to discuss the data dearth. They seized on the idea of a major panel survey and turned to Xie, who had experience with the University of Michigan's ongoing Panel Study of Income Dynamics, for help implementing it. What once might have been a prohibitively sensitive survey became a darling of China's most prestigious university.

After securing local backing for a new research center—Peking University's Institute of Social Science Survey (ISSS) in Beijing—the Chinese scholars sought input from abroad. In addition to the Michigan survey, they looked at the British Household Panel Survey, the Taiwanese Panel Study of Family Dynamics, and the German Socio-Economic Panel Study, says ISSS director and survey co-principal investigator Qiu Zeqi. Xie and colleagues borrowed elements from all these efforts, then adapted questions and methodology to the rapidly developing country.

China's effort has constraints. It steers clear of questions about the one-child policy, ethnicity, and politics. Minority regions like Tibet, Xinjiang, and Inner Mongolia are excluded, although Xie says this is mainly a logistical matter: Sending interviewers to query nomads on the Tibetan plateau, for instance, would be too costly.

Although some hot-button issues remain off limits, the project does address subjects such as quality of life, social service needs, and the rich-poor gap. In addition to using specialized survey software, a 380-strong army of interviewers has been trained to “observe how wealthy the family is, how they interact, how clean the house is,” says Xie. The robust design allows researchers to analyze dynamics within families as well as make comparisons across neighborhoods, says demographer Robert Mare, president of the Population Association of America, who is not affiliated with the project. “Social scientists in the U.S. are very excited that this study will be carried out,” he says.

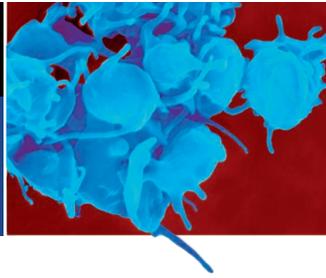
In preparation for the project, the Chinese team in 2008 and 2009 conducted a pilot survey of more than 2300 households in Beijing, Shanghai, and Guangdong Province. Their findings, which are available upon request from ISSS, suggest that the economic reality in those major urban cen-



Going door to door. Chief survey designer Yu Xie queries a Gansu Province villager about his health and wealth.

A SLICE OF LIFE IN CHINA

Questionnaire	Examples of topics
Community	Water sources, employment stats, election participation, housing prices, medical facilities, family planning, income and expenditures
Household	Child care, family and friend networks, household economy, cost of living, family business ownership
Adult	Education, marital status, military experience, employment, transportation, <i>guanxi</i> (social networks), life satisfaction, confidence in the future, medical expenses, exercise, diet and nutrition
Adolescent	School enrollment, language use, parental supervision, allowance, leisure activities, dating
Interviewer Perceptions	Interviewee's behavior, household member relationships (e.g., estranged, authoritative, gender-equal), community conditions



Multitasking platelets

562



Japan rescues asteroid mission

565

ters is a far cry from the picture frequently painted of China's boom.

Marketing executives often rhapsodize about the appetite for luxury goods among urban Chinese. But the pilot survey showed that even in developed areas like Beijing, Shanghai, and Guangdong, überconsumers are a small percentage of the population. In 2009, an average of 80% of residents' expenditures went toward basics such as food, housing, and transportation. These burdens were unequally distributed, moreover: Rural people spent considerably more on health care than did city dwellers. (Both Beijing and Shanghai are administrative areas with both rural and urban populations.) Only 45% of respondents said they

were satisfied with their lives, with more Beijingers describing themselves as happier on the whole than did residents of other areas.

Expanding those inquiries nationwide will be far from easy. "One of the challenges is how to track people" for follow-up visits, says Qiu. Many rural Chinese lack home phones and change cell phone numbers frequently, and some 150 million to 180 million people migrate from the countryside to the cities for work. The solution, says Qiu, is to record contact information for three friends or relatives of each respondent. That safeguard proved invaluable during the pilot survey, when interviewers returning to study areas discovered that whole villages had been relocated to make way for construction

projects. In the end, the team managed to track down about 80% of respondents.

That success rate bodes well for the Family Panel Studies, which aim to gather data from a representative sample that would cover 95% of the population. True advances may be years down the line, when data allow for comparisons over time. But scholars are already excited. "This survey will show us societal development from individuals' perspectives," says Ren Qiang, a sociologist at Peking University. That puts it far ahead of previous Chinese efforts, he says. "It's much, much better than what we had before."

—MARA HVISTENDAHL

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GENOMICS

Frog DNA Yields Clues to Vertebrate Genome Evolution

Add another group of animals to the growing menagerie of creatures whose genomes have been sequenced. On page 633 of this issue, Uffe Hellsten, a bioinformaticist at Lawrence Berkeley National Laboratory in California, and his colleagues describe the sequence of the Western clawed frog, *Xenopus tropicalis*, the first member of the amphibian branch of the tree of life to be so honored.

Amphibians branched off from other vertebrates about 350 million years ago, and the group has been evolving along a path separate from mammals, reptiles, and birds ever since. "For this reason, the frog genome sequence provides unique insights into genome dynamics over an extended period of evolution," says Ben Evans of McMaster University in Hamilton, Canada. "It fills in a crucial gap in our understanding of genome diversity and evolution of organisms," adds David Cannatella, an evolutionary biologist at the University of Texas, Austin.

The draft of the genome is in hundreds of pieces—not complete enough to be ordered chromosome by chromosome, but Hellsten and colleagues were able to match long stretches of contiguous sequence with equivalent sequences in the chicken and human genomes. A 150-million-base region in the center of human chromosome 1, for example, has a virtually identical counterpart in the frog and chicken genomes. "That implies that

whole region has remained intact for 350 million years," says Hellsten, and it represents an ancient chromosome. Other matchups indicated that three stretches of DNA fused onto human chromosome 1 after breaking off from elsewhere in the genome. Another intact region in chicken and frog split up in the human genome and spread across six chromosomes. "There appears to have been more frequent chromosome fusion and fission in mammals than in birds and frogs," says Evans.

The frog genome may offer new insights for not only evolutionary biologists but also biomedical scientists. It has 1700 genes that have been linked to human diseases such as type 2 diabetes, acute myeloid leukemia, alcoholism, sudden infant death syndrome, and congenital muscular dystrophy. These can be investigated using the frog to probe the basic mechanisms by which these genes work. "It opens a large number of doors for comparative and functional genomics," says Erica Bree Rosenblum, an evolutionary biologist at the University of Idaho, Moscow.

Researchers chose *X. tropicalis* to be the first amphibian sequenced because developmental biologists use it in their studies and it has a relatively small genome: 1.7 billion



Floating to fame. An aquatic frog, the Western clawed frog, now has a sequenced genome.

bases stretched across 10 chromosomes, about half the size of the human genome. Now, researchers are hungry for more. "One species of frog does not allow one to say very much about frogs," says Cannatella. Others point out that *Xenopus* is unusual among frogs, so "now they need to do a typical frog," says David Wake, an evolutionary biologist at the University of California, Berkeley. Cannatella would like to see the fire-bellied toad, *Bombina orientalis*, sequenced next.

Nonetheless, says Stephen O'Brien, a geneticist at the National Cancer Institute branch in Frederick, Maryland, this *Xenopus* genome "is an important beginning and a treat for comparative genomics."

—ELIZABETH PENNISI

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