

This is the third in a series on HIV/AIDS in Asia, leading up to the XV International AIDS Conference to be held in Bangkok, Thailand, in July. The first two parts, on Southeast Asia and India, were published in the 19 September 2003 and 23 April 2004 issues (www.sciencemag.org/sciext/aidsasia).

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Poised for Takeoff?



BEIJING—Last year, a simple handshake sent a message that reverberated across China. On 1 December, World AIDS Day, every major media outlet in the country carried pictures of Premier Wen Jiabao greeting Sun Fuli, an AIDS patient at Ditan Hospital here. Sun, a former taxi driver from Shanxi Province, was one of three HIV-infected patients who met with Premier Wen. In this country, where symbolism is paramount, the message was unmistakable.

The visit by Premier Wen and Health Minister Wu Yi to Ditan Hospital sent a signal that HIV/AIDS had finally moved to the top of the central government's agenda. "There were still some people within the State Council who said, 'How dare they go see these AIDS patients,'" says Wang Longde, vice minister of health. But at the highest levels of the central government, Wang says, there has been a "huge change." Equally important, it was the first time that anybody from China's top leadership had reached out to confront the fear and discrimination that HIV-infected people frequently face in China.

During the past year, China has launched a program that promises free anti-HIV drugs to all poor people who need them. The central government has budgeted some \$60 million this year for AIDS prevention and control, more than three times the amount spent in 2002. It has also eased the stern stance toward injecting drug users (IDUs)—who account for two-thirds of the

country's estimated 840,000 HIV infections—and is sponsoring pilot projects in "harm reduction," such as offering clean needles and methadone treatment (see p. 1434). "Today, what the government is doing is probably more than 500% what it was doing a year ago," says epidemiologist Ray Yip, country director for the Global AIDS Program of the U.S. Centers for Disease Control and Prevention (CDC).

Several forces compelled the government to revamp its HIV/AIDS strategy. The first is that China's epidemic is at a critical juncture. It is still at an early stage, with a relatively low prevalence in the general population of 1.3 billion people, but some outside assessments have warned that it is poised for takeoff and has all the ingredients for a major disaster. Although officials dismiss the warnings as alarmist, they work with a new sense of

urgency—sharpened by the recognition that China badly mishandled last year's outbreak of severe acute respiratory syndrome (SARS). "We have to thank the SARS epidemic, which gave a wake-up call for the whole country," says Shao Yiming, an AIDS vaccine developer (see p. 1437) at China's CDC who heads the China Integrated Programs for Research on AIDS (CIPRA), an ambitious \$14.8 million project funded by the U.S. National Institutes of Health.

A second health fiasco pushed the government to intensify its AIDS efforts: Thousands of poor people became infected with HIV after selling blood to commercial outfits that used unhygienic procedures (see p. 1438). That tragedy may have accelerated the country's response to HIV/AIDS by 5 or 10 years, says Yip.

China still faces staggering problems.

Take Sun Fuli's case. Anti-HIV drugs rescued him from death in 2003: "I thought I only had 2 days to live," he says. But he received a contaminated blood transfusion in 1998, long after most countries had cleaned their blood supplies. Now the government provides him drugs, but they're far from optimal (see p. 1433), and he must travel hundreds of kilometers to have his treatment properly monitored. Clinicians who want to improve HIV prevention and treatment efforts also must contend with a government that harshly punishes critics—it detained physician Wan Yanhai for 1 month because of details he exposed about the



More than a handshake. Sun Fuli smiles at the famous photo of Premier Wen Jiabao greeting him and other AIDS patients.

◀ **Peer prevention.** Nong Yanling (standing) and other heroin users in Ningming help run a novel needle-exchange program.

blood donor calamity—and remains wary of nongovernmental organizations and other outsiders offering help.

In April, *Science* visited Beijing, villages in Henan Province hard-hit by infections of blood donors, and two areas with large numbers of IDUs and sex workers, Yunnan Province and Guangxi Zhuang Autonomous Region. Despite the denial of some interview requests, many scientists, officials, and people directly affected by the epidemic spoke with surprising candor. And many stressed how much they believe their government's response has improved over the past year. "I never say anything as praise to government officials, but this time I can't help myself," says Zhou Zengquan, an AIDS clinician in Kunming. "The things they've done, I'm really grateful."

Today, says Shen Jie, deputy director of China's CDC, "the biggest challenge doesn't lie in the government policy."

Young epidemic

Wu Hao, head of infectious diseases at Beijing's You'an Hospital, leads a tour of the modern, well-kept AIDS ward, which has 50 beds, all but 10 of which are empty. You'an, which specializes in infectious diseases and sees more AIDS patients than any hospital in the city, treated its first case in 1990. Until 1999, explains Wu, they saw as few as 10 AIDS patients a year. But each year since 1999, You'an has cared for about 200. "Most people who come here for AIDS were infected in 1994, 1995, so they started to feel ill about 1999 or 2000," says Wu.

For the largest AIDS hospital in the capital city of the world's most populous nation, 200 AIDS patients a year is a remarkably small number. But AIDS cases present a crude barometer because, as Wu indicates, several years separate HIV infection and symptomatic disease. Further complicating matters, the epidemic has profound regional differences: Beijing, which treats many former blood donors from neighboring provinces, does not reflect the situation in the rest of the country. Fear of discrimination, poverty, and a lack of education about the disease also keep some ailing patients from seeking help. Still, the sharp increase in AIDS cases at You'an does reflect a national phenomenon: HIV did not make much headway in China until the 1990s.

"Generally speaking, it's still an immature epidemic," says CDC's Shao.

Fewer than 4000 AIDS cases have been reported from 1985 to December 2003, says the Ministry of Health. But the ministry recognizes that the reported figure grossly underestimates the number of AIDS cases, most of which go unreported, and says the true total is about 80,000. Similarly, the 62,159 cumulative HIV infections reported to the health ministry by last December is a small fraction of the actual number, which they put at about 840,000.

Epidemiologists divide China's AIDS epidemic into three phases. During the entry phase, from 1985 to 1988, the country recorded only 22 HIV infections, and officials viewed the disease as a foreign problem. China's health minister declared in 1987 that the disease could be kept at bay because homosexuality and promiscuity were limited. The government banned the import of blood products and barred HIV-infected foreigners from living in China, and



Longde's journey. Health Vice Minister Wang Longde says he's seen a "huge change" in the central government's AIDS policy.

an article in the state-controlled *Beijing Review* the same year noted that it was illegal for Chinese citizens to have sex with foreigners or to import secondhand clothing.

In 1989, nearly 150 IDUs in Yunnan Province in China's southwest corner, which borders Myanmar (Burma), tested positive, initiating the "spreading phase" of the epidemic. During the early 1990s, many commercial outfits pooled blood from paid donors, separated out the plasma, and then returned the red blood cells to the donors so that they could sell blood more frequently; as many as 250,000 blood donors became infected with HIV by this process, according to estimates in China's recent application to the Global Fund to Fight AIDS, Tuberculosis, and Malaria. To this day, IDUs and blood donors account for more than two-thirds of

China's infections (see pie chart, p. 1432).

The current "expansion phase" that started in 1995 has seen rapid spread from IDUs and blood donors to their partners and children, as well as the steady rise of infections in sex workers. Gay men, who are ignored by official surveillance, are an emerging high-risk group, too. "China is experiencing one of the most rapidly expanding HIV epidemics in the world," the country's application to the Global Fund declares. Part of the expansion may simply reflect China's more forthright attitude about the scope of its epidemic: Official estimates of the number of infected people more than doubled between 1999 and 2002.

Just how far HIV will spread into the general population has triggered much speculation—and blistering discourse.

Reading tea leaves

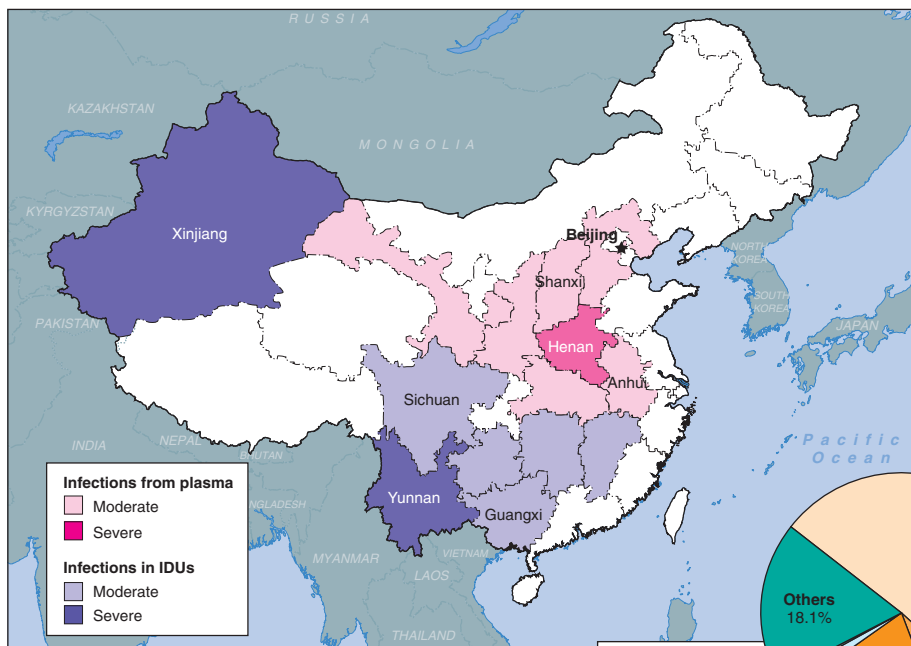
From HIV's point of view, China certainly has many attractive features.

Aside from the boom in heroin use and the thriving sex industry, the country has a "floating population" of more than 100 million migrant workers; these predominantly young, male laborers—prime customers for sex workers—typically travel between their rural homes and cities, offering HIV extensive transportation routes to remote areas. Knowledge about the disease and condom use remains low in many populations. Other sexually transmitted diseases, which can facilitate the spread of HIV, have steeply increased over the past 2 decades.

Myron Cohen, an AIDS researcher at the University of North Carolina (UNC), Chapel Hill, who chairs CIPRA's scientific advisory board, says the "surplus" of men that has re-

sulted from the country's one-child-per-family policy may also spur the epidemic. In a paper in press at *Sexually Transmitted Diseases*, Cohen, UNC sinologist Gail Henderson (his wife), and their Chinese colleagues explain that many unmarried men possibly "will find no sexual outlet over the course of their lives other than commercial sex, and this may lead to even greater demand for sexual services in the future."

In a particularly dire assessment of China's future, a United Nations-sponsored group issued a report in June 2002 called *HIV/AIDS: China's Titanic Peril* that warned: "A potential HIV/AIDS disaster of unimaginable proportion now lies in wait to rattle the country, and it can be feared that in the near future, China might count more HIV infections than any other country in the world." A



Focal and local. Reported HIV cases vastly understate the actual number, but they reveal that most infections have occurred in IDUs and plasma donors who primarily live in distinct regions.



U.S. National Intelligence Council report issued a few months later projected that by 2010, China could have up to 15 million HIV-infected people.

Health Vice Minister Wang dismisses these gloomy forecasts, noting that many predictions rest on the assumption that China would not dramatically alter course: “With so much support and collaboration from the international community and our own efforts, it’s clear that China will have a very bright, rosy future for AIDS control.”

Experts inside and outside China agree that *Titanic Peril* exaggerated the threat. “I really don’t think we’re looking at that gloomy of a picture,” says demographer Simona Bignami-Van Assche, a Ph.D. candidate at the University of Pennsylvania in Philadelphia who did a detailed study of HIV/AIDS in China. As Bignami-Van Assche explains, forecasters base their predictions on estimates of HIV prevalence in China that come from “sentinel” sites around the country. China has only about 200 such sites nationally—Thailand, by comparison, has 500 for a population 5% the size of China’s—which creates much of the confu-



Counterintuitive countermeasures. Ray Yip of the U.S. CDC says prevention should target the already infected.

sion. When Bignami-Van Assche analyzed data for Yunnan Province, which has about one-fourth of the national sites, and extrapolated to the rest of the country, she concluded that China will have no more than 6 million infections by 2010.

“It’s understandable that the outside world has developed a misunderstanding about China’s attitude toward AIDS statistics,” says Vice Minister Wang. In part, the problem mirrors one seen with SARS: There is no national system for collecting all available data, and local officials “were not so open,” says Wang. “They fear if they make it public how many people are infected with AIDS it will affect their economic development.”

CDC’s Shao bristles at the notion that the national government wants to downplay the epidemic. “Nobody has tried to hide any figures,” says Shao. (A recent *Time* magazine article that outraged many Chinese scientists had the headline “China’s Secret Plague.”) He is now advocating that China establish a database to mesh data from national and provincial testing sites, blood-screening efforts, and hospitals.

China’s crossroads

As the government expands HIV/AIDS testing, along with counseling and education, epidemiologists should gain a better handle on the scope of the epidemic. Just as importantly, the attitudes of health care workers and the public toward the disease should also change.

You’an Hospital’s Wu Hao says widespread fear still exists among many doctors and nurses. And he unabashedly shows photos of how his colleagues first reacted to AIDS patients in the early 1990s. The doctors wore boots and gloves, and after the patients died, they slid huge ice blocks under their beds to avoid moving their bodies to the morgue. “They lied to funeral homes that otherwise would not take the patients,” says Wu. And they hauled the dead patients’ furniture outside and burned it. Today, Wu says he and his staff train health care workers from across the nation to help avoid the mistakes that You’an made.

Changing public attitudes will be a lot easier now that China’s leadership has acknowledged the problem. But major challenges remain. Trained AIDS clinicians and the equipment needed to monitor treated patients remain scarce. Few anti-HIV drugs are on the market. And campaigns to promote condom use, needle exchange, and HIV education will test the ability of the country to move from words to actions.

Because China’s epidemic has yet to explode, a window of opportunity exists today that soon will close, says Chung To, whose Hong Kong-based Chi Heng Foundation (which means “bring wisdom into action”) helps AIDS orphans in China and educates gay men about the disease. “China is at a crossroads, and whether it will become South Africa or Thailand depends on how the government reacts in the next 2 years,” says Chung, referring to Thailand’s widely lauded success at slowing HIV’s spread.

The U.S. CDC’s Yip notes that most of the infections to date have occurred in discrete locations in two specific populations: IDUs and blood donors. This means that China could target “the source of the future infections” as the cornerstone of its prevention campaign.

UNC’s Cohen says that China’s large number of IDUs, sex workers, migrants, and surplus men means “mega-dangers” still lie ahead. But he urges outsiders to appreciate the dynamic nature of the country, which can mobilize public health troops with unparalleled speed and efficiency—as SARS last year proved. “If success is what they want,” says Cohen, “this can-do culture is unlikely to accept failure.”

—JON COHEN

SOURCES: CHINA MINISTRY OF HEALTH (PIE CHART); U.S. CDC (MAP)