



China fights growing problem of tuberculosis

Tuberculosis is a massive drain on China's health budget, in part because of a high incidence of sufferers who develop drug-resistant strains of the disease

BY TAN EE LYN
REUTERS, GUANGZHOU, CHINA

China, saddled with the world's second largest tuberculosis burden after India, is fighting an uphill battle against drug-resistant forms of the disease which will only drain the country's health budget.

Drug-resistant TB, far more expensive to treat, emerges when patients fail to follow treatment regimens and take substandard drugs or stop treatment too early.

Liu Zhongwu, a stonecutter working in southern China, for example, stopped taking his TB medication midway through a standard six-month course in 2007 because it was too costly. "Even though one or two drugs were free, I had to pay 500 yuan [US\$73] a month for other drugs [to reduce side effects] and the side effects were bad, I suffered terrible gastric pain and had to stop work, I didn't even have energy to walk," said Liu.

It is precisely this sort of behavior that health experts are trying to stop because if the TB bacteria is not fully eliminated, it can mutate, resurge later and become resistant to the small arsenal of drugs that can fight the disease.

China has 4.5 million TB cases currently; and each year 1.4 million people fall ill with the disease. TB killed 160,000 people in China in 2008, according to the World Health Organization.

TB killed 1.8 million people across the world in 2008, or a person every 20 seconds. It is not only a scourge in poor countries but also in the West, where it has flared anew in the last 20 years because of AIDS, which weakens the immune system.

DRUG-RESISTANT STRAIN

TB is also a big drain on China's health budget because of a high incidence of people with a drug-resistant strain of the disease, which is a lot harder and more expensive to treat.

In such cases, patients need to take drugs for up to two years and the worst type of TB,

for which there is no cure, kills one out of every two patients.

"If there are more drug-resistant cases, the cost of TB treatment will rise by a lot, that's for sure. With drug resistance, we can't use first-line drugs and other drugs cost a lot more," said Lin Yan (林岩), director of the China office of the non-profit International Union Against TB and Lung Disease.

"When these patients infect others, the others will get drug-resistant TB. That increases the cost of treating that person and increases the chances of him not recovering."

Regular TB costs 1,000 yuan to treat in China but drug-resistant TB ranges from 100,000 to 300,000 yuan per person, said Zhong Qiu (鍾球) of China's TB Expert Consultative Committee.

China ranks second in the world with 112,000 drug-resistant TB cases in 2007, after India with 131,000. Russia has 43,000 cases, while South Africa has 16,000 and Bangladesh 15,000.

China spent US\$225 million on tackling TB in 2008, up from US\$98 million in 2002, according to the WHO. These figures do not take into account what patients pay out of their pockets, typically between 47 and 62 percent of their hospital bills.

Drug-resistant TB made up 27.8 percent of all TB cases in China in 2000 versus five percent in advanced countries.

"There are many reasons for China's drug-resistant TB problem. Patients stop taking drugs when they feel better, maybe after a month. Some have no money for drugs if the treatment is not free and they don't even know this is a serious disease," said Lin.

"Some are so afraid of stigma they don't see a doctor, they just buy drugs over the counter."

IGNORANCE, POVERTY, STIGMA

TB affects mostly poor people, who typically live in places where healthcare is not easily accessible. Many patients pay not only for treatment but also transportation, and any chronic, long-term disease



Top: Tan Zhouchuan, a 32-year-old recovering from tuberculosis, in Huizhou, Guangdong Province, China. Above: X-rays from a tuberculosis patient in the US. Simple tuberculosis is simple to treat, but the medicine must be taken in specific combinations for six months to completely wipe out the bacteria.

Upper right: Li Jiachuen, a 45-year-old who ran out of money after he was diagnosed with tuberculosis, shows receipts from his treatment.

Lower right: Li poses with his chest X-ray.

PHOTOS: AGENCIES

can bankrupt entire families.

Li Jiachuen, 45, quickly ran out of money and had to borrow from relatives and friends after he was diagnosed with TB.

"I don't take drugs now. I don't even have money to pay off my 20,000 yuan debt. I spent thousands of yuan on diagnosis and treatment and even more on transportation," Li said.

The WHO recommends all TB treatment be free because the disease is a public health threat.

But in China, diagnosis and treatment is only free in specialist TB outpatient clinics. General hospitals, which have been self-financing since the 1990s, impose charges.

"TB is a political problem because it is infectious. It has societal impact, it is a threat

to public health ... free treatment is very important," said Zhong, who also heads the Anti-TB Research Institute in China's southern Guangdong province.

The world's only TB vaccine is 100 years old and there has been no new TB drug for more than 40 years. But the resurgence of TB due to AIDS has forced the West back into TB research in the last 20 years and a string of experimental drugs and vaccines are now in the pipeline.

Chinese scientists are working on a new class of TB drugs based on an old drug called clofazimine, used in the past to treat leprosy, said Ann Ginsberg, chief medical officer of the TB Alliance, a US-based non-profit scientific group that pulls together partners to develop new TB drugs.



"They [scientists] found a very promising lead compound and we hope within the next six months ... it will come into formal pre-clinical development and get the formal animal and non human studies that are required to convince the regulators it can go onto people," said Ginsberg.

Amazon explorers uncover signs of a real El Dorado

Huge geometrical mounds in the Brazilian jungle suggest that the area was once home to an ancient culture that rivaled the Aztecs

BY RORY CARROLL
THE GUARDIAN, LONDON

It is the legend that drew legions of explorers and adventurers to their deaths: an ancient empire of citadels and treasure hidden deep in the Amazon jungle.

Spanish conquistadors ventured into the rainforest seeking fortune, followed over the centuries by others convinced they would find a lost civilization to rival the Aztecs and Incas.

Some seekers called it El Dorado, others the City of Z. But the jungle swallowed them and nothing was found, prompting the rest of the world to call it a myth. The Amazon was too inhospitable, said 20th century scholars, to permit large human settlements.

Now, however, the doomed dreamers have been proved right: there was a great civilization. New satellite imagery

and flyovers have revealed more than 200 huge geometric earthworks carved in the upper Amazon basin near Brazil's border with Bolivia.

Spanning 250km, the circles, squares and other geometric shapes form a network of avenues, ditches and enclosures built long before Christopher Columbus set foot in the new world. Some date to as early as AD 200, others to 1283.

Scientists who have mapped the earthworks believe there may be another 2,000 structures beneath the jungle canopy, vestiges of vanished societies.

The structures, many of which have been revealed by the clearance of forest for agriculture, point to a "sophisticated pre-Columbian monument-building society," says the journal *Antiquity*, which has published the research. The article adds: "This hitherto

unknown people constructed earthworks of precise geometric plan connected by straight orthogonal roads. The 'geoglyph culture' stretches over a region more than 250km across, and exploits both the floodplains and the uplands ... we have so far seen no more than a tenth of it."

The structures were created by a network of trenches about 11m wide and several feet deep, lined by banks up to a meter high. Some were ringed by low mounds containing ceramics, charcoal and stone tools. It is thought they were used for fortifications, homes and ceremonies, and could have maintained a population of 60,000 — more people than in many medieval European cities.

The discoveries have demolished ideas that soils in the upper Amazon were too poor to support extensive

agriculture, says Denise Schaan, a co-author of the study and anthropologist at the Federal University of Para, in Belem, Brazil. She told *National Geographic*: "We found this picture is wrong. And there is a lot more to discover in these places, it's never-ending. Every week we find new structures."

Many of the mounds were symmetrical and slanted to the north, prompting theories that they had astronomical significance.

Researchers were especially surprised that earthworks in floodplains and uplands were of a similar style, suggesting they were all built by the same culture.

"In Amazonian archaeology you always have this idea that you find different peoples in different ecosystems," said Schaan. "So it was odd to have a culture that would take

advantage of different ecosystems and expand over such a large region."

The first geometric shapes were spotted in 1999 but it is only now, as satellite imagery and felling reveal sites, that the scale of the settlements is becoming clear. Some anthropologists say the feat, requiring sophisticated engineering, canals and roads, rivals Egypt's pyramids.

The findings follow separate discoveries further south, in the Xingu region, of interconnected villages known as "garden cities." Dating between 800 and 1600, they included houses, moats and palisades.

"These revelations are exploding our perceptions of what the Americas really looked liked before the arrival of Christopher Columbus," said David Grann, author of *The Lost City of Z*, a book about an attempt in the 1920s to

find signs of Amazonian civilizations. "The discoveries are challenging long-held assumptions about the Amazon as a Hobbesian place where only small primitive tribes could ever have existed, and about the limits the environment placed on the rise of early civilizations."

They are also vindicating, said Grann, Percy Fawcett, the Briton who led the expedition to find the City of Z. Fawcett's party vanished, bequeathing a mystery and partly inspiring Conan Doyle's book *The Lost World*.

Many scientists saw the jungle as too harsh to sustain anything but small nomadic tribes. Now it seems the conquistadors who spoke of "cities that glistened in white" were telling the truth. They, however, probably also introduced the diseases that wiped out the native people, leaving the jungle to claim — and hide — all trace of their civilization.