INFECTIOUS DISEASE

WHO Calls for Action Against TB

In the movie *Outbreak*, an exotic virus breaks out of Africa, killing everyone it infects. In real life, however, pathogens don't have to be exotic to cause a deadly epidemic. In a report released on 20 March, the World Health Organization (WHO) reveals that an old scourge—tuberculosis—is still rampaging out of control despite the organization's 2-year-old campaign to prevent its spread. Even more chilling, drug-resistant strains of *Mycobacterium tuberculosis*, the bacterium that causes TB, are on the rise.

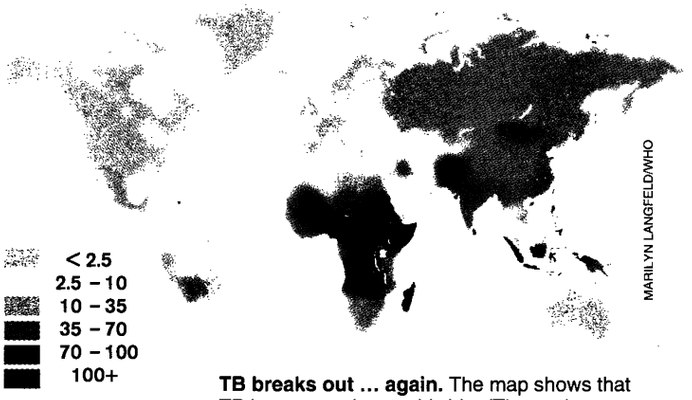
To combat these outbreaks, the WHO report, entitled "Stop TB at the Source," recommends international adoption of a control strategy called Directly Observed Treatment—Short-course (DOTS), which aims to ensure that all patients complete their full course of treatment. Without an effective treatment program, WHO predicts that by the year 2005, TB will kill 4 million people a year—up from about 2.5 million. The toll could be even worse if the multidrug-resistant strains continue to spread.

The upswing in incidence of TB is being fueled by what WHO spokesperson Kraig Klaudt calls "worldwide medical chaos." In the West, efforts to combat TB have largely slackened off due to the mistaken belief that the disease was brought under control with the introduction of effective drugs in the 1940s. In fact, the epidemic had simply been pushed into the poorer reaches of society—the inner-city dwellers and the homeless—and is now re-emerging with a vengeance, partially fueled by the spread of the AIDS virus, which increases susceptibility to TB. Governments in developing countries, says WHO, have been slow to channel resources into TB control, even though studies show that in terms of productive lives saved it's cost-effective.

Because only patients with active TB can transmit the disease, WHO argues that control programs should focus on people with symptoms—usually a chronic cough—rather than waste resources on screening programs that also pick up patients with inactive forms of TB. "It's the cough that spreads the disease," says Paul Nunn, WHO's chief of TB research and development. "The cough to TB is the same as sex to HIV."

But TB treatment requires taking antibiotics for a full 6 months. Symptoms abate within a few weeks, however, and patients, thinking they are cured, may stop their treatment, allowing the disease to spread and encouraging the emergence of drug-resistant strains of TB. To stop that from happening, WHO is campaigning for governments to adopt the DOTS treatment strategy: Use trained health workers to check that patients take every pill, and supply free drugs and other incentives to ensure that patients finish their treatment. "TB control is basically a management problem," says Thomas Frieden, head of the New York City Health Department's Bureau of TB Control. Frieden should know, because New York is one of the few places in the world that has turned its current TB epidemic around. In the past 2 years the number of new TB cases has been reduced more than 20% to about 3000 by using the DOTS regimen, as well as treatment incentives such as free subway tokens.

Despite New York's best efforts, however, "a handful of patients are resistant to all [anti-TB] drugs," says Frieden. To curb the resurgence of those lethal strains of TB, since 1993, the city health department has resorted to placing patients who persistently refuse to complete treatment under "detention until cured" in the hospital.



TB breaks out ... again. The map shows that TB is re-emerging worldwide. (The scale numbers indicate deaths per 100,000 people.)

In developing countries, says Nunn, "the chances are that multidrug resistance is less of a problem," because patients are more likely to go untreated than to receive partial treatment. Hot spots of resistant strains have been identified in India, Brazil, and some other developing countries, however. TB strains have no respect for international borders, notes Nunn, which is another reason that "governments need to be made aware that TB is a huge problem [for which] there is a cost-effective treatment."

–Rachel Nowak

PALEONTOLOGY

Fossil Dealers Innocent—and Guilty

Paleontologists are not often hauled through the criminal courts. But since January, Peter Larson and four other commercial fossil collectors have been in front of a Rapid City, South Dakota, judge and jury, facing 149 felony charges ranging from wire fraud to stealing fossils from federal lands. On 14 March the jury acquitted the defendants, all associates of the Black Hills Institute of Geological Research, of 73 charges, found them guilty on eight, and failed to reach a verdict on 68. The case has been closely watched as a test of the government's ability to crack down on fossil-poaching.

The mixed verdicts have produced, not surprisingly, mixed reactions. "We are extremely happy to be able to get back to work," says Larson. "It becomes a little bit difficult when you are looking at a potential of 350 years in prison." But the collectors are not out of the woods: Larson was convicted of failing to declare money he took into and out of the country while fossil-dealing, and a colleague was found guilty of undervaluing fossils on customs documents. "They were convicted of serious felonies," says U.S. Attorney David Zuercher, one of the prosecutors. "It is likely that under the sentencing guidelines they will go to jail." Academic paleontologists, worried that commercial collectors are taking important fossils out of scientific hands, hope the verdicts will rein collectors in, says Michael Woodburne, a geologist at the University of California, Riverside. (Larson has published and presented data at scientific meetings.)

The controversy began in 1990 after a Black Hills excavation unearthed the most complete *Tyrannosaurus rex* skeleton ever found, dubbed "Sue." A dispute over Sue's ownership led to a federal raid on the institute in May 1992. Records and fossils, including the *T. rex*, were seized, and the government concluded that institute workers had conspired to steal fossils from vast government-owned areas of South Dakota.

The trial showed that collectors had indeed taken fossils from federal land, but the jury was unable to decide whether these were deliberate acts and so remained hung on many of those charges. The judge may order not-guilty verdicts on these counts or declare a mistrial, allowing the government to retry the defendants. Defense lawyers had argued that ranchers had told the collectors the lands were private and had given permission for the digs. But even if ignorance works as a defense this time, Larson says that in the future, "we are going to be a lot more careful."

–Antonio Regalado