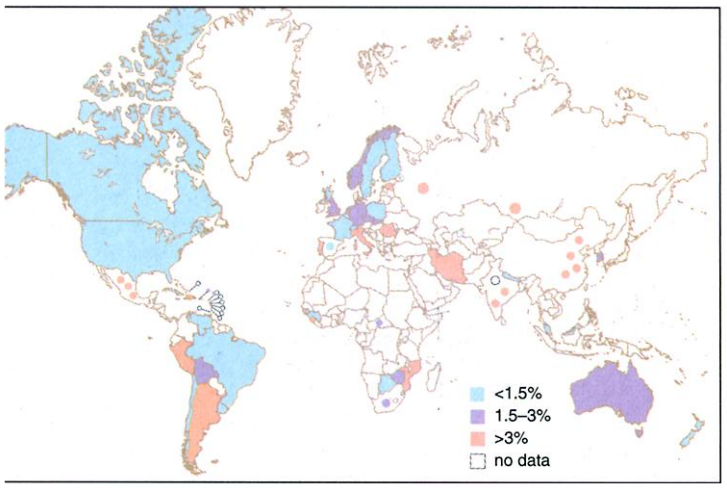
INFECTIOUS DISEASE

Drug-Resistant TB on The Rise

Tuberculosis is back with a vengeance. Once nearly vanquished by antibiotics, at least in the developed world, tuberculosis resurged in the late 1980s and now kills more than 2 million people a year—second only to AIDS among infectious diseases. Especially frightening is the emergence of drug-resistant strains. The wake-up call came in the early 1990s, when New York City was hit with an epidemic in which about 9% of cases were resistant to two or more TB drugs. The outbreak took years—and cost $1 billion—to quell. But global trends in resistant TB, though the subject of considerable speculation, have been unknown.



Tough bugs. Prevalence of TB cases resistant to two or more front-line drugs (data collected 1994–99).

Now, the World Health Organization (WHO) has some answers, and they are grim. Drug-resistant TB is rampant and appears to be spreading, WHO concludes in its most comprehensive report to date. Said WHO Director-General Gro Harlem Brundtland: "This report confirms our worst fears." WHO warns that these resilient strains could cripple the economies of developing nations and could erupt in Western countries as well.

Scientists blame the rise of resistant strains on a history of drug misuse. Sometimes doctors do not prescribe the proper course of treatment, which involves taking a mix of drugs for up to 6 months. Understandably, some patients fail to comply. And in many poor or war-torn countries, drugs are not always available.

WHO's new report covers 72 regions and has statistics on 28% of known TB cases. In three of the 28 areas for which data were available from a 1997 WHO survey, the prevalence of drug-resistant TB has skyrocketed. In both Germany and Denmark, it climbed by 50% since 1996, to 10.3% and 13.1% respectively. New Zealand fared even worse—resistance more than doubled to 12%.

Experts agree that treating TB properly from the outset can prevent the rise of resistant strains. The best weapon is a strategy called Directly Observed Treatment, Short-course (DOTS), in which health workers make sure that patients swallow every pill over the long course of treatment. The problem is, only 21% of TB patients around the world received DOTS in 1998. And for TB strains resistant to two or more drugs, known as multidrug-resistant (MDR) TB, conventional drugs and DOTS don't work. Instead, health workers must rely on second-line drugs that are less effective and more expensive. Treatment can cost up to $250,000 per person and take 2 years—well beyond the reach of many poor countries.

Now that MDR TB has arisen, these strains are spreading through communities. The problem is particularly severe in six regions—Estonia, Henan Province in China, Latvia, the Ivanovo and Tomsk regions in Russia, and Iran—where between 5% and 14% of first-time TB cases are multidrug resistant. The spread of resistant strains has ignited intense debate over whether it's best to spend scarce resources on treating the widespread susceptible strains or on tackling MDR strains. One thing that's clear, however, is that the problem is a devil of our own making. Resistance is "almost an inevitable consequence of bacterial evolution and human nature," says molecular epidemiologist Peter Small of Stanford University. "The bug wins again." **–ERIK STOKSTAD**

CREDIT: (LEFT) WHO

PUBLIC HEALTH

Bat Researchers Dispute Rabies Policy

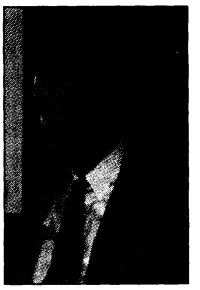
How noticeable is a bat bite? That seemingly esoteric question is center stage in a dispute over the small risk of catching rabies from bats. Based on some puzzling human rabies deaths, public health officials, including the Centers for Disease Control and Prevention (CDC) in Atlanta, recommend that in some circumstances people exposed to bats get rabies shots, even if there's no evidence of a bite. Bat researchers counter that the animals don't attack and leave stealth bites and

ScienceScope

Slight Rebound The National Science Foundation's (NSF's) flagship program to support graduate students is struggling to find talented underrepresented minorities after phasing out a special effort to attract them. The new class of 850 fellows, announced last week, contains 89 minority students pursuing Ph.D.s in science, mathematics, and engineering. Although that's a bit more than last year's crop of 76, the number is a far cry from the 175 minorities who earned the 3-year fellowships in 1998, the last year in which NSF held a separate competition for Hispanics, African Americans, and Native Americans (*Science*, 16 April 1999, p. 411). In addition, the number of minority applicants continues to fall, down 25% in 2 years, while the number of whites and Asians applying has held steady.

NSF officials hope a larger annual stipend, up $1000 this year to $16,200 toward a goal of $18,000, will boost demand. They also invited applicants to write about "any impediments" to a degree, says Susan Duby, head of graduate education, and asked reviewers to ponder NSF's role in serving underrepresented groups. "We're making more of an effort," says Duby, "but we haven't seen the payoff yet."

Resisting TB The effort to beat tuberculosis resistance is getting a boost. The Bill and Melinda Gates Foundation last week announced that it is giving $25 million to a new consortium of foundations, international organizations, and pharmaceutical companies called the Global Alliance for TB Drug Development. The groups will put the funds to use to come up with new drugs and test their efficacy in clinical trials.



And more help may be on the way. On 24 March, U.S. Representatives Sherrod Brown (D–OH, pictured) and Connie Morella (R–MD) introduced a bill that would boost anti-TB spending from $35 million to $100 million to establish effective TB programs, especially in nations that suffer most from the disease.

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