

Trachoma stopped by mass antibiotics

Results from an experiment in three African countries plagued by trachoma, a blinding eye disease, indicate that dosing entire villages with antibiotic pills can stifle the ailment.

In trachoma, the bacterium *Chlamydia trachomatis* infects the eye and causes swelling of the eyelid. This makes the eyelashes turn inward and scratch the cornea. Repeated infections lead to blindness (SN: 5/29/99, p. 351).

An international team of scientists tested a total of 5,502 people in pairs of villages in Egypt, Tanzania, and Gambia. *C. trachomatis* infection rates ranged from 17 to 44 percent. The researchers then gave everyone in one village in each country azithromycin, erythromycin, or amoxicillin pills once a week for up to 3 weeks. People in the other village got eye ointment containing tetracycline, the common treatment for trachoma, once a day for up to 6 weeks. The researchers retested the villagers 2 to 4 months and again 12 to 14 months after medication.

Both treatments were initially successful. At the first follow-up, 95 percent of infected villagers who received at least one dose of azithromycin were free of the microbe. Of those who got at least 4 weeks of tetracycline eye ointment, 82 percent were uninfected, researchers report in the Aug. 21 LANCET.

A year later, infection rates held between one-quarter and one-half of prior levels in the three villages where tetracycline had been administered. The oral antibiotics had worked even better in all three countries. It had slashed trachoma infection to only 7 percent of what it had been in the Egyptian village, with smaller reductions elsewhere, says study coauthor Sheila K. West of Johns Hopkins Medical Institutions in Baltimore.

Tetracycline ointment costs less than \$1 for the 6-week dosage period, she says, whereas azithromycin costs up to \$20 for the three doses. However, patients are more likely to take the three pills of azithromycin than the uncomfortable tetracycline eye ointment. Indeed, poor compliance with the treatment schedule accounted for the lower effectiveness rates of the tetracycline, she says. —N.S.

Ear-infection surgery has limited gain

Removing a child's adenoids as a remedy for repeated ear infections is recommended for certain patients. A new study, however, suggests this drastic measure doesn't provide much more help in the long term than standard antibiotic treatment.

Scientists determined subsequent infection rates in 280 children who received medication and underwent surgery for recurrent ear infections. These rates were compared with those of 181 others who had received medication only. Some of the 280 children also had their tonsils removed. The researchers found that in the first year, those whose adenoids and tonsils were removed had about two-thirds as many ear infections as those getting medication alone, but this advantage disappeared in the second and third years after surgery.

The long-term leveling of the therapies' effects might simply reflect the fact that most children grow out of ear infections, says study coauthor Jack L. Paradise, a pediatrician at the Children's Hospital of Pittsburgh and the University of Pittsburgh.

Surgery to remove adenoids alone provided even less protection than the combined surgery, Paradise and his colleagues report in the Sept. 8 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

Meanwhile, nearly 15 percent of surgical patients suffered from complications such as pneumonia or hemorrhage. Children in all groups received 10 days to 6 weeks of antibiotics.

Children with recurrent ear infections that antibiotics don't allay might benefit more from minor surgery to implant tubes that ventilate the middle ear, Paradise suggests, than from the major surgery of tonsillectomy or adenoidectomy. In severe cases where tubes fail to keep the middle ear healthy, however, Paradise says, surgery is the best option. —N.S.

Managing sweet sounds

Staging an opera or performing a symphony that demands a full orchestra is a complicated business. Musical scores can run to hundreds of pages, distributed among dozens of performers. During rehearsals, a conductor may rearrange or delete sections of music and change which instruments play which parts. Individual musicians may scribble reminders on their pages to indicate how loudly or softly to play certain passages.

Making and tracking such modifications to the score can add up to a massive information-management headache. Now, software engineers have climbed onto the podium. Paolo Nesi and his coworkers at the University of Florence have developed a computer-based system for creating, updating, and storing annotated scores. The researchers describe their project in the September COMPUTER.

In the Music Object-Oriented Distributed System (MOODS), a network of electronic lecterns replaces an orchestra's traditional printed music scores and metal stands. Musicians and the conductor read from screens that scroll the music in time with the performance, eliminating the shuffling of pages. In addition, each musician's lectern allows editing of an individual part, and the conductor's lectern allows modifications of the main score. An archivist's workstation monitors major changes, distributing updated music to all the lecterns.

During rehearsals, "several musicians may work simultaneously on the same music score, on the same part, and on the same measure, changing and adding music notation symbols and sharing the results of the manipulation in real time with the other musicians," the researchers note.

Nesi and his colleagues demonstrated their prototype system at the Teatro alla Scala in Milan, Italy, in a concert featuring nine musicians performing music by Mozart, Vivaldi, and Verdi. Developed further, this technology could prove immensely useful for musicians, conductors, and even music publishers, who could distribute customized electronic versions of specific performances, Nesi remarks. —I.P.

Clicking onto the Web's patterns

With an estimated 800 million pages, the World Wide Web is an enormous repository of information. It's also the product of practically uncontrolled development (SN: 1/16/99, p. 37). Any individual or institution can, if skill and budget allow, create a Web site made up of any number of documents containing any number of links to other pages. Two reports in the Sept. 9 NATURE reveal that the Web has a remarkably predictable large-scale structure, despite its apparently haphazard growth.

Bernardo A. Huberman and Lada A. Adamic of the Xerox Palo Alto (Calif.) Research Center sampled Web sites and found that the distribution of pages follows a simple mathematical relationship known as a power law. In essence, most sites have only a few pages, whereas just a few sites have millions of pages. That makes it possible to estimate the number of sites of a given size without checking the entire Web. For example, one can infer that, among 250,000 randomly selected sites, about 25 would have a million or more pages.

As another surprising regularity in the Web's structure, the distribution of link number also follows a power law, report physicist Albert-László Barabási and his colleagues at the University of Notre Dame in Indiana. They studied links between pages and found that most pages incorporate just a few outgoing links, whereas a few pages have a huge number. The power-law relationship indicates that the probability of a Web user coming across a document with a large number of outgoing links is significantly higher than it would be if links were randomly distributed among all sites. The relationship also suggests that two randomly chosen documents on the Web are, on average, only 19 clicks away from each other (SN: 8/22/98, p. 124). —I.P.