

# Many Doctors Would Shun AIDS Patients

London, The Great Plague of 1665: A terrifying illness spreads through the city, and as the death toll rises, most physicians and surgeons flee to the countryside, leaving their patients at the mercy of bubonic fever.

Medical historians have documented cowardly responses to London's plague and to other waves of deadly illness that swept through Europe and the New World in times past. Today, while individual acts of medical heroism help to mitigate yet another epidemic, there are anecdotal reports of physicians refusing to care for people infected with the human immunodeficiency virus (HIV). Now, a scientific study bears witness to that trend.

The Nov. 27 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION carries results from the first large-scale survey of general

practitioners' attitudes toward people infected with the AIDS-causing virus. The report unveils a pattern of negative feelings toward homosexual men and intravenous drug users, two groups at high risk of contracting the infection.

Psychologist Barbara Gerbert of the University of California, San Francisco, and her colleagues mailed questionnaires to a random sample of 2,004 primary-care physicians across the United States. The 70 survey questions were designed to uncover attitudes toward people infected with HIV. All respondents remained anonymous.

Among the 1,121 physicians who responded, 68 percent said they believed they had a responsibility to treat HIV-infected patients. At the same time, 50 percent of the respondents said they

would not treat an HIV-infected patient if given the choice.

Thirty-five percent of the doctors said they would "feel nervous" around homosexuals and agreed with the statement: "Homosexuality is a threat to our basic social institutions." Slightly more than half said they felt uncomfortable treating intravenous drug users — perhaps in part because addicts often don't follow medical advice, Gerbert says.

The attitudes uncovered in the survey may reflect the larger societal prejudice against homosexuals and drug abusers, Gerbert says. However, concerns about contagion may add to that ill will. "I think even people who are based in science have a fear of HIV transmission," she says. Scientific studies show that health care workers face a small risk of contracting HIV from occupational exposure.

In a related study reported in the same journal, Roberta B. Ness of the University of Pennsylvania in Philadelphia and her colleagues looked at data collected from a national program designed to match medical students with hospital residency openings. Ness and her colleagues discovered that from 1983 to 1990, New York City hospitals showed an eroding ability to attract U.S. medical students to residencies compared with hospitals in cities with fewer AIDS patients. The researchers attribute some of that loss to avoidance of AIDS patients, but they also suggest that other factors, such as economic considerations, influenced the students' residency selections.

Taken together, the two new reports suggest that "thousands of physicians may be systematically avoiding or refusing to care for AIDS patients," assert Oscar W. Clarke and Robert B. Conley of the American Medical Association (AMA) in Chicago. In an editorial accompanying the research reports, they sternly remind physicians of their duty to share the burden of risk that goes along with the AIDS epidemic.

"It's unfair to the physicians who are willing to treat patients with HIV that others sit back and say: 'It's your risk, not mine,'" says Conley, a physician and lawyer. "Physicians do have the freedom to choose whom their patients will be. On the other hand, you cannot use that principle to support illegal or invidious discrimination against one group."

AMA's Council on Ethical and Judicial Affairs concluded in 1988 that physicians cannot ethically refuse to treat HIV-infected patients. For doctors who decline to comply with that standard, medical societies should provide counseling and, if necessary, take disciplinary action, Conley says. — K.A. Fackelmann

## Computing by committee: Sharing searches

Teamwork underlies a wide range of human activities, from the founding of a company to assemble and market a new product to the gathering of a group to solve a problem. Teams provide a means of sharing not only the work but also the information gleaned by individual members as they pursue specific tasks.

Experience suggests that for solving certain kinds of problems, cooperation can substantially improve performance, permitting the completion of these tasks faster than could be accomplished by an individual or a group in which members work in isolation. The same principle may apply to solving problems by computer, especially in situations where there are no efficient, step-by-step procedures, or algorithms, available, and where finding the answer requires searching through a large number of possibilities.

Using computer simulations of cooperative problem solving, a team of computer scientists at the Xerox Palo Alto (Calif.) Research Center has now provided some of the first quantitative estimates of the degree to which information sharing can speed up searches for answers to certain types of problems. Scott H. Clearwater, Bernardo A. Huberman and Tad Hogg describe their findings in the Nov. 22 SCIENCE.

As a simple test problem, the researchers chose a type of cryptarithmic puzzle that requires finding the digits that correspond to certain letters of the alphabet so that the numbers represented by the given words add up correctly. For example, for what digits would the sum DONALD + GERALD = ROBERT be true? This particular problem has one solution, which is given by A = 4, R = 7,

and so on.

Cooperation in solving this puzzle takes the form of reading and writing hints on a central "blackboard" accessible to all the "individuals" (in this case, computer programs) working on the puzzle. Hints consist of lists of letter-digit assignments that add up correctly for at least one column in the given sum. Starting at different points, each individual constantly checks the blackboard for hints, randomly generating and testing new combinations whenever all hints are exhausted or none is available.

Compared with noncooperative strategies, such searches bring a striking overall improvement in performance, the researchers found. The actual speedup varies greatly from run to run because the time needed to solve the puzzle depends strongly on the quality of the first few hints posted on the blackboard. Nonetheless, shared information reduces the number of possibilities that need to be considered by focusing the problem solvers on more plausible courses of action.

In computer science, this work suggests that instead of seeking a single, ideal algorithm for solving a certain problem, a better strategy would involve developing a set of relatively simple computer programs that work on the problem concurrently while communicating their partial results. "You might be better off sometimes having a bunch of dumb processes cooperating," Huberman says.

"These results also have implications for problem solving in general," he adds. "In a sense, this is a simple simulation of a model of something like a society."

— I. Peterson