DH's Paul Palumbo, M.D., described in the *New England Journal of Medicine* a new therapy for pediatric AIDS, tested in six African nations, that is better and cheaper than current therapy.

Solving a rare epidemiological puzzle

On December 5, 2009, a 24-year-old southern New Hampshire woman fell ill with what she thought was the flu. But when fever, muscle aches, and sweating were joined by pain in her head, neck, and back, then by vomiting, cramps, and dizziness, she sought medical help.

Test: On December 14, she went to a walk-in clinic and was immediately transported to a nearby hospital. A blood test showed that her white blood cell count was at least four times higher than normal, and a CT scan of her abdomen revealed swollen lymph nodes, very irregular-looking bowels, and a massive accumulation of fluid.

Doctors removed the diseased parts of her intestines, stabilized her, and transferred her to Massachusetts General Hospital, where her condition fluctuated as doctors struggled to identify her mysterious illness. It was not until December 24 that they reached a definitive diagnosis: gastrointestinal anthrax, a rare bacterial infection. But how had she been exposed? And was anyone else at risk? These questions led to a multiagency, multistate investigation.

How had she been exposed? And was anyone else at risk?

Effort: Elizabeth Talbot, M.D., a DH infectious disease specialist and former deputy epidemiologist in New Hampshire, led the effort. She was assisted by Jodie Dionne-Odom, M.D., also a DH physician and the current deputy epidemiologist, and colleagues in the state's Department of Health and Human Services.

Talbot interviewed the patient's family and friends to piece together how she might have contracted the disease. She learned that the patient had attended a drumming circle near the University of New Hampshire on December 4, the day before she fell ill. Among the more than 50 drums at the event were several with tops made of animal hides—a potential source of anthrax spores. Testing confirmed that two drums were contaminated with the same strain of anthrax that the patient had. (A full account of the investigation was published in the September 8, 2010, *Journal of the American Medical Association*.)

Infected: "It was very difficult," says Dionne-Odom of the quest. The investigators wanted to protect the woman's privacy, but dozens of other people had also attended the drumming circle and could have also been infected. "For the first couple of weeks, we didn't know if there were a lot of other cases out there that had just been missed," Dionne-Odom says.

The team worked quickly to identify and contact everyone who'd attended the event. They interviewed 187 people and determined that 84 had potentially been exposed; all 84 were offered antimicrobial medications and an anthrax vaccine.

A year later, with no other cases having been reported, Talbot and Dionne-Odom can reflect on a job well done and on the young woman's good fortune. "The mortality of gastrointestinal anthrax is about 60% to 80%," explains Dionne-Odom, "so her prognosis was not good." But fortunately she survived and is doing fine, she adds. "We're very, very happy about that."

JENNIFER DURGIN

ZOUBIN ZARIN

A drum like this was to blame in a case of anthrax.

Artificial intelligence?

To ensure that they've interpreted mammograms correctly, most radiologists turn not to another physician but to a computer. In a survey, DMS researcher Tracy Onega, Ph.D., found that far more radiologists rely on computer-aided detection (CAD) to confirm mammography readings than ask for a second opinion from another radiologist—even though more physicians believe a second reading by a human would improve cancer detection rates. "Radiologists' perception of CAD and double reading is important for clinical practice at the level of individual radiologists and also from a larger perspective related to the diffusion of technology," Onega wrote in *Academic Radiology*.

No stomach for rising rate

A team of DMS researchers examined trends in the incidence of esophageal adenocarcinoma, cancer in the muscular tube that connects the mouth to the stomach. From 1973 to 1996, the rate rose sharply, from 3.6 cases per million Americans to 21.9 per million, an annual increase of about 8%. But from 1996 to 2006, the average annual increase was only 1.3%. "Our results suggest that the previously observed steady increase in esophageal adenocarcinoma incidence has slowed, which represents a significant change in trend," they concluded.

Diane Gilbert-Diamond, D.Sc., a research associate at Dartmouth, was the first author on a paper which reported that children who are deficient in Vitamin D are likely to gain weight rapidly.

Address affects alcohol availability

Heart rate, blood pressure, temperature . . . address? According to Ethan Berke, M.D., an expert on medical geography, where people live strongly influences their behavior, and therefore their health. "We need to start considering habitat and environment as an aspect of our clinical care," he says. "We could even consider it the next 'vital sign.'"

Berke is interested in how the characteristics of a neighborhood help determine its inhabitants' risk of poor health. In a recent study published in the *American Journal of Public Health*, he and colleagues reported that the availability of alcohol varies according to race, poverty, and education—all factors associated with health disparities.

Tool: Most previous research on the relationship between health and the availability of alcohol has taken a local or regional perspective. For this study, the DMS team developed a powerful mapping tool to show the location of all the points of sale of alcohol across the U.S., including liquor stores, bars, grocery and convenience stores, and gas stations.

After all these outlets were identified, the researchers used census data to calculate the number of outlets per 1,000 people within neighborhoods. They also used well-established criteria to divide the country into urban and rural areas.

Outlets: The team found that in urban areas, which make up about two-thirds of the country's census tracts, the density of alcohol outlets correlated with larger populations of racial and ethnic minorities, greater poverty, and lower educational attainment. In other words, alcohol is more available in places where residents are already at higher risk for health problems.

Interestingly, none of these relationships was found in rural areas.

Interestingly, however, none of these relationships was found in rural areas, possibly because people in rural areas have to travel farther to buy alcohol, making the effect more difficult to measure.

Berke hopes that identifying neighborhoods at risk of higher levels of alcohol abuse may help communities and health professionals ensure that appropriate preventive measures and treatments are available where they are most needed.

The researchers also plan to take a closer look at the behaviors driving alcohol consumption at the individual level. "Risk factors in an area occur in clusters, and the influence of the interplay between advertising, availability, and behavior of others is difficult to tease out," says Susanne Tanski, M.D., a coauthor of the study. Examining the issue from the perspective of individuals will give the researchers a better understanding of how both community-level and individual factors add up to help determine alcohol consumption.

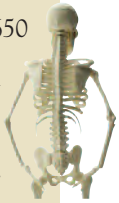
Platform: In addition, Berke adds, the tools developed for this study could provide a valuable platform for future research on geographic risk factors by other DMS investigators. KATHERINE ROWE

MARK WASHBURN

Berke, right, is an expert on medical geography.

Back in the OR

For patients with symptomatic lumbar spinal stenosis—a narrowing of the spinal column in the lower back—surgery is likely a better option than nonsurgical treatment, according to a long-term study. A team led by DH's James Weinstein, D.O., followed about 650 patients for four years, comparing pain and function in those who had surgery to outcomes in patients treated with interventions such as physical therapy and medications. "Those treated surgically showed significantly greater improvement . . . compared to patients treated nonoperatively," the researchers reported in the journal *Spine*.



White coats, red ink

"Physicians cannot make the decision to follow a [primary-care] career path lightly," concluded DH's Martin Palmeri, M.D., and colleagues in a recent article. They found that, given the heavy debt most medical students incur and the long training for medicine, primary-care physicians may spend the first three to five years of their careers earning less than their expenses, forcing them to make difficult choices that colleagues in more lucrative subspecialties may avoid. Writing in *Academic Medicine*, the authors argue that this discrepancy should be addressed through loan repayments or other programs to encourage interest in primary care.

DMS's Kathryn Zug, M.D., was invited to share with 800 European dermatologists findings on eczema-like symptoms from a decade of research by a professional group of which she is an officer.

The effect of color on colorectal cancer

Over the past 45 years, death rates from colorectal cancer have dropped steadily among white Americans, but among black Americans a very different story has unfolded. Mortality from colorectal cancer has decreased only slightly among black women and has actually increased during that period among black men, according to a study led by Samir Soneji, Ph.D., a demographer who joined the DMS faculty earlier this year.

Rates: The study, published in the *American Journal of Public Health*, showed that between 1960 and 2005, annual death rates from colorectal cancer dropped 54% for white women (from 241 to 111 deaths per million), but just 14% for black women (from 203 to 174 per million). The disparity was even more dramatic among men. Death rates declined 39% for white men (from 273 to 166 per million), but rose 28% for black men (from 201 to 258 per million).

Death rates rose 28% for black men between 1960 and 2005.

Colorectal cancer is one of the few cancers where there have been major advances in screening, treatment, and care, says Soneji, who gathered the data for this study when he was at the University of Pennsylvania as a Robert Wood Johnson Health and Society Scholar. Screening tests for colorectal cancer are widely accepted and effective, unlike tests for some cancers. And recent advances in surgery, chemotherapy, and radiation therapy have made it very treatable if found early.

It's known that "blacks receive less colorectal screening, and their cancer is detected at more advanced stages" than is the case for whites, Soneji and his coauthors wrote. But they found that racial disparities in survival persisted even after eliminating those variables. Black men and women with colorectal cancer are more likely to die from the disease than white patients of the same age group, gender, and stage at diagnosis. And the differential has been growing. The study found that blacks were 22% more likely to die than whites in the 1980s, 26% more likely in the 1990s, and 33% more likely in the 2000s.

But Soneji and his coauthors suggest that race itself may not be the driving factor in this widening gap. "Race is an important proxy for all sorts of other socio-economic factors," Soneji says, such as differences in income, wealth, educational attainment, employment, insurance coverage, and access to health care.

While the factors underlying the colorectal cancer disparities remain unclear, the "most likely" causes, the researchers wrote, are "differences in access to care or the quality of that care."

Disparities: When advances are made in the detection and treatment of particular diseases, Soneji explains, "the most resourced groups will benefit more than the least resourced groups, [because] the distribution and delivery of health care is quite inequitable." That's how disparities can widen over time—and how two very different narratives can unfold for the same disease.

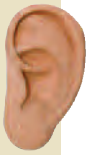
JENNIFER DURGIN

JUNIPER TRAILS

Soneji joined the DMS faculty earlier this year.

Now 'ear this

Doctors often use antibiotics to treat a draining ear, because the draining pus is often due to a bacterial infection. To study the spread of antibiotic-resistant bacteria, DH otolaryngologist James Saunders, M.D., examined cultures from 170 patients. He found that bacteria in 40% of the cultures showed resistance to at least some antibiotics, and in 5% to all oral antibiotics. "Antibiotic therapy has greatly facilitated the management of ear infections; however, frequent antibiotic use and misuse have led to the development of resistant strains, complicating the management of the draining ear," he wrote in an otolaryngology journal.



Environment and exercise

There are many obstacles—environmental as well as mental—that inhibit mothers in rural areas from getting exercise, found DMS researchers. "Barriers to physical activity in rural areas include having fewer places where one can be physically active and exercise locations being located too far away," they wrote in the *Journal of Women's Health*. "With all the benefits that physical activity can offer—decreased stress, increased health, and positive role modeling for the family—it seems worthwhile to provide support enabling mothers to make physical activity a priority." ■