Shelters from the Storm
Sex-Based Defenses Against Disease
Thomas Glass, PhD, knows precisely where to find the letter on his desk, crowded though it is with piles of paper.

“This letter is one of the most interesting things in my career,” says the associate professor in Epidemiology.

The correspondence is from a 59-year-old Baltimore woman, who wrote to Glass about her neighborhood in response to a 2008 newspaper story about his research; the article was headlined “Where You Live Can Harm Health.”

“It’s a battleground,” Glass reads from the letter. “Drug dealing and gun violence. We cannot sit on our porches or front steps for fear of robbery and drive-by shootings. You can’t even take a walk around the neighborhood on a beautiful sunny day or a lovely summer evening. When you have to leave for work before sunup and come home after sundown, you just say a prayer and go with God.”

“That’s why I study neighborhoods,” says Glass, who, for 10 years, has researched Baltimore neighborhoods to answer the question, How does where you live affect your health? Since 2001, as part of the Baltimore Memory Study (BMS), Glass and other researchers at the School have tracked 1,100 older Baltimore residents in 64 contiguous neighborhoods—from dangerous to middle class to affluent—studying the connections between neighborhood characteristics and residents’ health. They’ve published papers on how hazardous neighborhoods adversely affect cognition, cardiovascular health and obesity.

But Glass has long been troubled by the accuracy of traditional data-gathering methods in social behavior research—mainly interviews by researchers and surveys completed by study participants, known as pen and paper surveys. “We basically have used that method since the 1950s, even though we’ve learned in the meantime that human memory does not work like a tape recorder,” he says.

Five years ago, Glass got the opportunity to test another approach to data collection when he was awarded a National Institute on Aging grant to use wireless sensors in his Baltimore Memory Study research. Unable to find the technology he needed at a reasonable price, Glass and his colleagues designed their own system to measure social, physical and cognitive functioning.

Over the past five years, 100 participants in the BMS wore three sensors—a GPS, a voice recorder and an accelerometer, neatly bundled in a hip pack—for five days, as the devices collected real-time data points about study participants rather than relying on their memory’s imperfect snapshots.
data on physical activity, geographical location and speech patterns.

The sensed information translates into “millions of data points,” Glass says, that when analyzed as a whole using specially designed computer algorithms, will allow researchers to create movies, rather than isolated snapshots of people’s lives. By studying the data, Glass will be able to answer questions such as, Did they stay home during the day or leave the house? Where did they go? Did they socialize or remain isolated?

Glass says that the project—the first of its kind to gather audio, motion and geographical data in real time—is an important step in building a case for using sensors more widely in research. “The idea of getting increased accuracy and validity by removing the human brain as the mediator between us and the information is, I think, going to be a revolution in behavioral science,” he says.

In the field of gerontology, for example, the mining of data patterns through computer analysis could potentially identify seniors at risk for cognitive decline at an earlier stage than is now possible.

“We currently have no way to treat Alzheimer’s disease, and we’re not really good at preventing it once symptoms start. Part of that is that tests only reflect changes when it’s too late,” Glass says. “If we can flag people in time, we can do things like lower blood pressure, prevent minor strokes and other things that might slow down cognitive decline.”

Michelle Carlson, PhD, associate director of the Center on Aging and Health, views sensor-captured data as a path to answering complex questions about functioning “from the standpoint of integrating the body and the brain.”

Says Carlson, an associate professor in Mental Health, “I think it’s the future of data collection in terms of helping us find targets for intervention.”

In Glass’s work on neighborhoods, he has a particular interest in the theory that living in a dangerous environment increases a person’s chances of becoming disabled as an older adult. He’s excited about being able to combine information on neighborhood safety—911 calls, violent crime numbers, vacant buildings and other statistics—with sensor data that measure social interactions and that can indicate stress through voice patterns.

“The idea is to provide stronger evidence that where you live matters for health, so that we have more reason to worry about it as a society and make different choices about how we allocate resources,” he says.

Glass has applied for grants to study stress in young drug addicts with sensed, real-time data. Ultimately, he hopes to establish a center for sensor-based research in public health to improve the measurement of complex human behaviors. “Everything we care about in public health—fundamental rock bottom—is about complex behaviors,” he says, “taking drugs, what we eat, physical activity, who we have sex with, who we love—and they’re all extremely difficult to measure the way we’ve been doing it.”

—Jackie Powder

NEWS TO LIVE BY

HIGHWAY CONGESTION
Living near busy roadways increases the odds of developing allergies and asthma, according to a January report in the Journal of Allergy and Clinical Immunology. In a study of teens living next to a busy road in Lima, Peru, William Checkley, MD, PhD, assistant professor of Medicine and International Health, and colleagues found that the youths showed a 30 percent greater chance for allergies to dust, pet hair and mold and potentially twice the risk of having asthma symptoms and/or requiring medications than those who lived a quarter mile away.

“Getting increased accuracy and validity by removing the human brain as the mediator between us and the information is, I think, going to be a revolution in behavioral science.” —Thomas Glass

KIDS, PARENTS AND FOOD
Contrary to popular belief, parents may have a limited influence as role models on their children’s eating behaviors, writes International Health and Epidemiology associate professor Youfa Wang, MD, PhD, MS, lead author of a study in the December 2010 Journal of Epidemiology and Community Health. The analysis of research from different countries published since 1980 found weak parent-child resemblance in dietary intakes. This indicates that factors such as schools, peers and the local food environment may have a greater influence on children’s diets.

A TROUBLING TRENDS
Baltimore’s persistently high rates of HIV prevalence and unrecognized HIV infection among African-American men who have sex with men (MSM) indicate an urgent need for increased prevention strategies, according to a February study published in the Journal of Acquired Immune Deficiency Syndrome. Lead author Danielle German, PhD ’09, MPH, assistant scientist in Health, Behavior and Society, reports that in 2008, 45 percent of black MSM were HIV positive—making them 2.5 times more likely than white MSM to be infected—and of this group, 77 percent were not aware of their HIV status.

ADMINISTRATION...мериканской улице. В перуанском городе Лима, штат Уильям Чекли, MD, PhD, аспирант по медицине и международному здоровью, и его коллеги обнаружили, что жители, живущие возле шумной дороги, имеют в два раза больше шансов страдать от аллергий на пыль, шерсть домашних животных и грибок, а также более высокий риск развития астмы.

“Getting increased accuracy and validity by removing the human brain as the mediator between us and the information is, I think, going to be a revolution in behavioral science.” —Thomas Glass

KIDS, PARENTS AND FOOD
В отличие от распространенного мнения, родители могут иметь ограниченное влияние как примеры для своих детей на их пищевые привычки, пишет профессор международной здравоохранения и эпидемиологии Youfa Wang, MD, PhD, MS, основной автор исследования в декабрьском номере журнала Journal of Epidemiology and Community Health. Анализ научных исследований из разных стран, проведенных с 1980 года, показал слабый родительско-детский сходство в диетических привычках. Это указывает на то, что факторы, такие как школы, сверстники и окружающая среда, имеют большее влияние на диетические привычки детей.

A TROUBLING TREND
Балтиморские постоянно высокие уровни заболеваемости HIV и неопознанных случаев HIV в афроамериканском населении мужчин, участвующих в сексе с мужчинами (MSM), указывают на необходи́мость увеличения предотвращения инфекции, согласно исследованию, опубликованному в февральском номере журнала Journal of Acquired Immune Deficiency Syndrome. Главный автор Даниэлл Герман, PhD ’09, MPH, аспирант по здравоохранению, поведению и обществу, отмечает, что в 2008 году 45% черных MSM были HIV-позитивны — что делает их в 2,5 раза более уязвимыми, чем белые MSM, и из этой группы 77% не были осведомлены о своем статусе HIV.
Though obesity has reached epidemic proportions in the U.S.—nearly one in three adults falls into that category—60 percent of physicians in a recent study did not give obese patients weight-related counseling. And, as it turns out, physicians are even less likely to offer such guidance to obese patients who are black.

That finding was a surprise for Sara Bleich, PhD, an assistant professor in Health Policy and Management, who led a study to see if race concordance (when a doctor and patient share the same race) affects weight-related counseling. She wanted to know, for example, would a black doctor talk more about healthy lifestyle choices with a black patient? Bleich found that blacks received less weight-related counseling regardless of their physician’s race. “That result was pretty striking,” she says. She found, for example, that white physicians were 50 percent less likely to offer exercise counseling to black obese patients as compared to white obese patients. And black physicians were 65 percent less likely to offer weight-reduction counseling to blacks compared to whites.

The study, published online in January in *Obesity*, focused on obese patients and looked at survey questions that asked physicians whether they gave counseling about weight reduction, diet and nutrition, or exercise. Pulled from a national survey, the 2,000 randomly selected physicians and their patients represented all geographic regions of the U.S. The surprising findings left Bleich and her colleagues with more questions than when they started. “We don’t know exactly what’s going on there,” Bleich says. “If you’re a black obese patient, why are you getting inferior care?”

The answer undoubtedly involves a variety of complicating factors, including social and economic issues, says Bleich. She speculates that physicians on the whole may have a more negative perception of obese black patients—they might think these patients are less likely to follow through after counseling, lack resources like healthy food options or access to gyms, or are more likely to engage in risky behaviors.

This latest finding comes as Bleich continues to push toward her larger goal of finding ways to improve obesity care.

Bleich wonders whether time-pressed doctors, faced with patients who have chronic illnesses such as hypertension and diabetes, find it too daunting to spend precious minutes on weight-related counseling—even though such problems often stem from obesity.

“Should it really be in the hands of physicians?” Bleich asks. Would dietitians or nutritionists—people with time to provide ongoing support—be better suited to providing obesity care?

To find out, Bleich is surveying physicians, this time to find out what assistance they need to provide better weight-related counseling, as well as the extent to which they feel it is their job to do so in the first place.

—Amy Dusto

For urban youth suffering from social-emotional difficulties, behavior problems and poor academic performance, a school-based mindfulness intervention involving yoga-based movement can be a positive antidote, according to a new study by Tamar Mendelson, PhD, assistant professor in Mental Health.

A pilot randomized-controlled trial conducted in four Baltimore public schools suggests that the 12-week intervention (held four times per week, for 45 minutes each) significantly reduced stress responses such as rumination, intrusive thoughts and emotional arousal. Mindfulness practices may help the students’ ability to regulate thoughts and emotions, says Mendelson.

Her research appeared in the October 2010 issue of the *Journal of Abnormal Child Psychology*.

—Christine Grillo
Sometimes hunger is the mother of invention. In 1991, when Cuba lost its comradely support from the collapsing Soviet Union, the island country faced a sudden food crisis. It had no choice but to reinvent its agriculture. Once a sugar crop monoculture, this socialist nation now puts mostly organic, sustainably farmed fruits and vegetables on Cuban tables 365 days a year.

At the time of the USSR’s collapse, Cuba had relied for 30 years on trade with the Soviets, receiving above-market price for sugar, while buying heavily discounted oil, pesticides and fertilizers, and importing much of its food. Without Soviet support, Cubans found themselves largely unable to import, farm or even put gasoline in their tractors.

A decade of dire straits followed. Dubbed by Fidel Castro the Special Period in Peace Time, this era precipitated an involuntary reduction in the average Cuban diet from about 2,900 calories a day to 1,900. Some research suggests that the average Cuban lost 20 pounds during the Special Period.

But during this time, Cuban agriculture metamorphosed. Forced to use the resources available, and unable to transport sufficient food from rural to urban areas, farmers found ways to bring agriculture into the cities, improving both food access and food security.

Earlier this year, two senior research program coordinators from the Center for a Livable Future (CLF) traveled to Cuba as part of a delegation to learn from models in the agricultural metamorphosis. Jesse Kurtz-Nicholl and Sarah Rodman observed the intensive growing systems that yield 11 crop cycles a year.

“Everything is planted by hand,” says Kurtz-Nicholl, MPH ’10. “And the second they harvest, they infuse the soil with nutrients so they can start again.” Says Rodman, MPH ’10, “Cuba is actively working on research that hopes to show a diversified, organic, sustainable system can be just as productive while protecting the soil and using fewer inputs.” (In March, the UN published a report attesting that eco-farming can double food production in 10 years in low-income countries.) The researchers will share their findings in lectures for food production and sustainability courses, and Rodman will present findings about Cuban systemic support of urban agriculture at the annual meetings of the Agriculture, Food, and Human Values Society in June.

While there, the researchers studied Cuban farming methods. Via vermicomposting, farmers use worms to create fertilizer from waste. By planting multiple species of plants in the same bed—intercropping—soil is enhanced and pests are confused. And for further pest control, farmers rely on crops such as oregano, marigolds, roses and basil to either repel or lure away invasive insects. In rural areas, oxen, not tractors, pull carts and plow fields.

It’s not unusual to see farms outside of apartment buildings, or in former parking lots, or even in reclaimed dumps, say the researchers.

The Ministry of Public Health conducts regular soil testing and provides farmers with rat poisons that are made from natural materials and can be placed alongside gardens. The Ministry of Agriculture sends specialists four times a year to every growing site to share information and gather data on pests. Also, farms are obligated to provide a quota of food directly to institutions such as schools or hospitals, guaranteeing food access and security for citizens.

“If you wanted to start an urban farm here [in the U.S.],” says Rodman, “you’d have to be your own advocate. In Cuba, you can be part of a co-op that shares seeds, shares tools, buys together…. I think we can learn from these models.”

Although the country has succeeded in the produce market, protein still poses a problem. Cuba imports much of its poultry, mainly from the U.S. (The current U.S. embargo of Cuba prohibits the import of Cuban products but allows exports.) The next hurdle for those who want to further develop sustainable agriculture and self-reliance in Cuba is to sustainably incorporate farm animals into the current organic agriculture systems. —Christine Grillo
Needle-Free Measles Vaccine

Vaccines are a key way to reduce childhood mortality. But getting vaccines to those who need them, especially in countries with limited resources, continues to pose a public health challenge. A new method of delivery could hold a solution: Bloomberg School researchers have conducted the first successful test of a dry powder measles vaccine.

While such systems are used to administer medications and antivirals, there are currently no dry powder vaccines in use. Their employment for vaccines could mark a sea change in how other childhood vaccines—such as mumps and rubella—are delivered. "It's a single dose, and the dry powder is quite stable. This would just make delivering vaccines much easier—for both regular immunizations and mass campaigns," says Diane E. Griffin, MD, PhD, one of the researchers who led the recent test.

Measles is a live virus vaccine—it must be active when administered. "Once it's reconstituted it loses potency very quickly; it has to be kept cold, on ice. And you have to throw it out at the end of the day, so there's a certain amount of wastage that occurs," explains Griffin.

The current liquid form of the vaccine poses further problems during delivery—injections require a trained health worker and there are many well-documented problems involving safe use of needles and syringes, particularly in developing countries with limited health resources. "All of these things are hindrances to getting the kind of coverage with measles vaccines that you need. It isn't that you can't, but in developing countries it's a problem."

Though the prevalence of measles has decreased, it continues to be one of the top 10 causes of childhood mortality worldwide. Vaccination is the most effective means of preventing measles. Recent measles outbreaks in sub-Saharan Africa indicate that maintaining immunization levels is still a battle in the developing world.

Griffin and researchers tested the dry powder vaccine on rhesus macaques using two types of inhaler models with masks. The formulation of the live vaccine is the same as with the liquid version—what is new is the size of the particles. The dry powder tested by Griffin and colleagues was developed by Aktiv-Dry, a Colorado company specializing in stable dry powder formulations. "The trick with dry vaccines is that they need to be fine enough to get deep into the lung—not get stuck up in the nose, mouth and throat," says Griffin. Aktiv-Dry received funding from a 2005 Grand Challenge grant from the Gates Foundation to develop the dry powder vaccine.

Perhaps most promising, in the initial trial the dry powder vaccine appeared to be more effective in producing antibodies than the injected version. "Measles is usually spread by the respiratory route, and the idea is perhaps you would induce a better, or a more natural, immune response," says Griffin.

She notes that further testing is required to demonstrate whether the increased antibody response is the result of increased efficacy or simply higher concentrations of the vaccine due to the different delivery method. The vaccine will now undergo clinical trials in India, where it is manufactured.

—Phoebe Connelly

MSPH Degree Debuts

A renamed master’s degree program—the Master of Science in Public Health (MSPH)—debuted at the Bloomberg School this academic year as a way to better define the professional degrees that were previously offered through the Master of Health Science (MHS) program.

"It’s really bringing clarity to it as more of a professional degree," says associate dean for Student Affairs Michael Ward, MEd, of the MSPH. The degree—which is offered by the departments of Environmental Health Sciences; Health, Behavior and Society; Health Policy and Management; International Health; and Population, Family and Reproductive Health—is geared toward students who want to combine a more focused classroom experience with practical training to begin or advance their public health careers. MSPH alums may go on to hold positions in health departments, international disaster relief organizations, health education programs or other practice-oriented roles in public health, says Ward.

The MHS academic degree programs continue to prepare students for further graduate study or research careers and are offered by all academic departments at the School.

—Jackie Powder
Tradition can exact a heavy toll on women’s health.

In the cities and villages of northern Nigeria, for example, cultural taboos forbid pregnant women from eating certain nutritious foods like milk or eggs. Other traditions dictate that women have their first child at home—making it more difficult for a skilled birth attendant to be present for delivery and increasing risks for mother and baby. Perhaps most dangerous of all, girls often marry very young and sometimes conceive as early as age 11—creating grave risks for girls not yet physically ready to have a baby.

In such cultures, outsiders’ efforts to change traditions often are rebuffed. “It’s not likely that a technical professional from overseas would be able to pass the message across in a culturally acceptable way to the community,” says Oladosu A. Ojengbede, MBBS, a professor of Obstetrics and Gynecology at the University of Ibadan in Nigeria.

The solution? Work with traditional rulers. Ojengbede and the Bloomberg School’s Bill and Melinda Gates Institute for Population and Reproductive Health are collaborating with Nigerian emirs. The political and religious leaders wield enormous power. In traditional communities, their words carry the weight of decrees that must be obeyed.

“The emirs are the very strong bridge between the government and community members,” says Ojengbede, a longtime Gates Institute collaborator. “They are also agents of change. They can transform old, negative practices into progressive new practices that improve health at the community and household level.”

The collaboration began in 2008 when Gates Institute director Amy Tsui, PhD, Ojengbede and others were introduced to the Emir of Suleja by Nigerian Rep. Saudatu Sani and soon began exploring options for collaboration. In November 2010, the Gates Institute and the International Vaccine Access Center brought the emirs of Suleja, Birnin Gwari and Damaturu to Baltimore to learn about maternal and child health issues. Faculty experts, including Janet DiPietro, David Paige and Henry Mosley, briefed the emirs on fetal and child development, risk factors for maternal mortality and morbidity, and other topics. The rulers also learned about the science behind public health staples such as attended births, child spacing, breastfeeding, immunizations and nutrition. In addition, the emirs saw a documentary about the risks for obstetric fistula and even death that pregnancy poses for girls.

The November meeting helped the emirs understand the significant role they could play in the health of their people. “They never knew how helpful their involvement could be,” says Ojengbede, director of the Centre for Population & Reproductive Health at Ibadan. They learned that a community’s health depends on much more than doctors and hospitals.

“I learned a lot. I can tell my people what they can do to lead a better life, a healthier life,” says His Royal Highness Zubair Jibril Maigwari II, Emir of Birnin Gwari. “Some of the things we saw made us feel there is need for intervention. Even though we can’t do it directly ourselves, in concert with the state and local governments, we can.”

The emirs who visited Baltimore will present what they have learned to the Sultan of Sokoto. The Sultan is both the cultural leader of more than 100 traditional rulers in the northern part of the country and the spiritual leader of all Muslims in Nigeria. The hope, according to Ojengbede, is that the Sultan and the other emirs will endorse maternal and child health efforts for their people. The emirs can also mobilize communities to create and maintain specific health programs, for example, increasing community immunization coverage to improve child health.

The three emirs who visited Baltimore have become greater advocates for maternal and child health, says Tsui.

“A statement by an emir who says girls shouldn’t be married so young or prioritizes women getting adequate obstetric care will go a long way,” Tsui says. “An emir who says it’s appropriate to use contraception between births to space the births sends a tremendously powerful message.”

—Brian W. Simpson
In the second week of July 1995, a high-pressure air mass stalled over the Midwestern U.S. In the cities and countryside below, the temperature began to climb. On July 12, the temperature reached 98 degrees in downtown Chicago. The following day, it hit a searing 106, with a nighttime low of 84. Over the next two days, the high stayed around 100.

In the city’s poorer neighborhoods, elderly people who either had no air conditioning or could not afford to use it suffered, and some died.

“Subsequent studies have estimated that more than 700 excess deaths occurred in the hottest part of that summer,” says Roger Peng, PhD, MS, author of a new analysis suggesting that deadly hot spells in cities like Chicago could get much hotter and deadlier before this century is out.

Peng, an associate professor in Biostatistics, took an interest in future heat wave mortality after reading a climate-modeling paper in Science in 2004, which predicted worse and more frequent heat waves for two exemplar cities, Chicago and Paris, as human-caused climate change increased. “I thought that was a very interesting paper, and wondered about the implications in terms of public health,” Peng says.

Peng had previously done analyses linking air pollution indices to increases in mortality—increases that show up as statistically significant moves above the normal background death rate.

“I thought, why don’t we use the same tools to estimate excess mortality risk from past heat waves, then use climate models to project those estimates into the future? There haven’t been many studies showing how climate change will affect human health,” he says.

Peng worked with several co-authors, including Claudia Tebaldi, who is a climate statistician at the University of British Columbia and senior author of the 2004 Science paper. They calculated excess hot-weather mortality for the Chicago area in the final two decades of the 21st century, under several climate scenarios. “Naturally, our excess mortality estimates varied with these [scenarios],” says Peng. “But under every scenario, excess mortality was greater than what one would expect from population growth alone. In fact, for some climate projections, we could expect the mortality equivalent of more than one 1995-type heat wave every year.”

The study, which appeared online in December in Environmental Health Perspectives, estimated that Chicago summers in the years 2081-2100 would claim between 166 and 2,217 excess deaths annually, depending on the climate scenario and model used.

The analysis didn’t take into account a number of factors, including the possible mortality offset from warmer winters. But Peng observes that “climate change in general is thought to be pushing the weather to greater extremes, so hotter summers could end up being only part of the climate-change health problem.”

—I jim Schnabel

Warning: Deadlier Heat Waves Ahead

"I thought, why don’t we estimate excess mortality risk from past heat waves, then use climate models to project those estimates into the future? There haven’t been many studies showing how climate change will affect human health.” —Roger Peng
Better Times for Vital Statistics

The top-cited paper in the journal *Pediatrics* every year is usually the “Annual Summary of Vital Statistics,” a compendium of data of interest to pediatricians, obstetricians and other health care trend watchers. However, the Summary’s popularity tends to obscure a significant problem, says Bernard Guyer, MD, MPH, an emeritus professor in Population, Family and Reproductive Health (PFRH), and a senior author of the Summary since 1994. “The data we’re publishing now in 2011 are from 2008—and they’re preliminary data at that, showing that our vital statistics reporting system is hopelessly untimely.”

Currently, the CDC obtains the data from state governments, which take them from birth and death certificates and similar documents, primarily collected for legal record-keeping reasons.

“When you’re thinking in a legal mode, a case doesn’t get closed until every ‘i’ is dotted and ‘t’ is crossed. So the data end up being delayed until every case is accounted for,” he says.

Guyer has been urging policymakers to change the system into a surveillance-oriented public health data system based on the electronic records that states increasingly use. “We now have the tools to create a data system that could tell us how many births and deaths occurred in the nation as recently as yesterday!” he says.

Even delayed data, however, have value, and the article makes the best use of the vital statistics data that are available at the time. On the radar screen this year is a continuing increase in the proportion of births to older women.

“The increase has been the largest for women over 40, who showed a 3 percent jump in fertility between 2007 and 2008,” says Donna Strobino, PhD, Guyer’s co-senior author on the Annual Summary and a fellow PFRH professor. “Women 35 and over now account for a larger proportion of births than do teenagers.”

Women who delay motherhood into their 30s and 40s may be satisfying other life goals, but Strobino notes that this delay seems to be coming at a cost. “Although rates of low birthweight and preterm births have been stagnant or slightly declining for all mothers, they generally have been rising for non-Hispanic white mothers, whose over-40 birth rate is higher than that for most other groups,” Strobino says. “Older women in general are more likely to have low birthweight babies, preterm births and multiple births.”

At the same time, the birth rate for America’s teens—“the highest teen birth rate in the developed world,” says Strobino—has resumed its long-term decline after an alarming uptick in the 2007 statistics. “I suspect that the move from 2006 to 2007 was just a hiccup, rather than a real reversal of the downward trend we’ve been seeing since 1990,” she adds.

The downward trend has not, however, brought the U.S. close to the relatively low average teen birth rate for other developed countries.

The Annual Summary this year was produced with the help of co-authors T. J. Mathews, MS; Arialdi M. Miniño, MPH; and Michelle J. K. Osterman, MHS, of the CDC’s National Center for Health Statistics.

---

**REPRODUCTIVE SHIFTS IN THE U.S.**

<table>
<thead>
<tr>
<th>Metric</th>
<th>2008</th>
<th>2005</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENERAL FERTILITY RATE (births per 1,000 women ages 15–44)</td>
<td>68.7</td>
<td>106.2</td>
<td>125.0</td>
</tr>
<tr>
<td>INFANT MORTALITY RATE (per 1,000 live births)</td>
<td>6.6</td>
<td>29.2</td>
<td>99.9</td>
</tr>
<tr>
<td>TEEN BIRTH RATE (births per 1,000 females ages 15–19)</td>
<td>41.5</td>
<td>40.5</td>
<td>61.8</td>
</tr>
<tr>
<td>LOW BIRTHWEIGHT BABIES RATE (percent)</td>
<td>8.2</td>
<td>7.0</td>
<td>9.9</td>
</tr>
<tr>
<td>CESAREAN DELIVERY RATE (percent)</td>
<td>32.3</td>
<td>31.8</td>
<td>22.7</td>
</tr>
</tbody>
</table>

CAAT Celebrates 30 Years

Thirty years ago, when the cosmetics industry was under fire for animal use in routine safety testing, the Johns Hopkins Center for Alternatives to Animal Testing (CAAT) was founded. Since then, CAAT has promoted alternatives to animal use in research, product safety testing and education. Its guiding principles are the three Rs: replace animal tests when possible, reduce the number of animals to the minimum necessary and refine methods to reduce pain and distress.

Since CAAT’s inception, there has been a dramatic increase in the number of animal replacement technologies, especially those involving in vitro cell cultures. CAAT will celebrate its 30th anniversary at the 8th World Congress on Alternatives and Animal Use in the Life Sciences in August, in Montreal. The first World Congress, held in 1993 in Baltimore, was organized by CAAT.

—Christine Grillo

Welch Wanderings

Not Tonight, I Have Autonomy

When African women have more decision-making power, they tend to have less sex.

The finding, based on standard survey data from about 24,000 married women in six sub-Saharan countries, appeared online in February in the Journal of Sex Research, and is the first to link sex frequency to women’s autonomy, according to lead author Michelle J. Hindin, PhD, MHS, an associate professor in Population, Family and Reproductive Health.

What causes this linkage isn’t clear, but Hindin suggests that African women’s lack of sexual enjoyment is a possible factor. “It’s not to say that sex is never enjoyable for women in these countries,” she says. “But there is some research indicating that cultural practices make it less enjoyable than it could be.”

The United States Agency for International Development (USAID) sponsors periodic Demographic and Health Surveys throughout sub-Saharan Africa, and Hindin and PhD student Carie Muntifering used the most recent survey data from representative countries in the region—Ghana, Malawi, Mali, Rwanda, Uganda and Zimbabwe. They compared women’s answers about the time since their most recent intercourse—a proxy for sex frequency—to answers about their roles in typical household decisions, such as everyday purchases.

The researchers then took into account several factors already known to influence sexual frequency, such as women’s age and employment status, and whether their husbands were living with them. “Even after accounting for these confounding factors, we found signs of a strong relationship between higher autonomy and lower sex frequency in the survey data from each of these countries,” says Hindin.

The findings represent an epidemiological snapshot of women’s responses, and while they suggest that autonomy and sex frequency are somehow related, they don’t prove that one directly causes the other. However, other studies have shown that in some of these countries, sexual pleasure tends to be enjoyed primarily by men. Some African women even engage in practices, including the use of herbs to dry the vagina, that are aimed at improving men’s pleasure—but can make their own experience of sex a painful one.

Research in this area could enable more effective programs for preventing unwanted pregnancy and sexually transmitted diseases. “Women who have more autonomy may be able to have a more important role in deciding when to have sex,” says Hindin. “This, in turn, could influence their risk of unwanted pregnancy and STIs.”

It also suggests that women’s sexual enjoyment is a potential public health issue. “We haven’t often looked at sex this way, but with data like these, I think we need to consider doing so.”

—Jim Schnabel

“African women who are empowered tend to have sex less frequently, according to a new study.

Women who have more autonomy may be able to have a more important role in deciding when to have sex. This, in turn, could influence their risk of unwanted pregnancy and STIs.”

—Michelle Hindin

not tonight, i have autonomy

shehzad noorani

African women who are empowered tend to have sex less frequently, according to a new study.
Women in the developing world looking for protection from cervical cancer have another reinforcement to add to their arsenal: male circumcision. Bloomberg School researchers Maria Wawer, MD, MHSc, and Aaron Tobsan, MD, PhD, have finished a multiyear study that shows the efficacy of male circumcision as a means of reducing the rate of HPV infection among women.

Human papillomavirus (HPV) can cause genital warts and cervical cancer. In the developing world, where 85 percent of infections occur, the situation is dire: WHO estimates that about 33 percent of East African women are harboring HPV. Cervical cancer is the leading cause of cancer death among women in Uganda, where the study took place.

Women partnered to circumcised men have a 25 to 30 percent reduction over time in the number of HPV infections, according to Wawer, a professor of Population, Family and Reproductive Health, and Tobsan, an assistant professor of Pathology at the School of Medicine. Though encouraged by the finding, Wawer cautions that couples should still practice other forms of safe sex. “Don’t think of this as a magic bullet,” she says. “It’s part of a program of protection.”

In the study, 5,000 uncircumcised HIV-negative men enrolled, together with their HIV-negative female partners. Then researchers randomly assigned men to be circumcised, either immediately or at the end of two years. Everyone was tested for infections at the beginning, middle and end of the study. Circumcised males had lower rates of HPV infection, likely because the procedure makes carrying the disease more difficult, says Wawer. And, as suspected, so did their female partners.

The parallel effect occurred because male circumcision both reduced the number of new male infections and increased the proportion of men with HPV at the time of enrollment who subsequently cleared the virus. “We hypothesize that the foreskin mucosa is an important site for infection,” notes Wawer. “Without this focal site, there is higher clearance at other sites along the male genital tract and less reinfection of other sites by the virus when it is no longer shed by [cells within] the foreskin mucosa.”

Since fewer men were infected, fewer transmitted HPV to their partners. A bonus: Wawer says that about 40 percent of women in the study reported being more sexually satisfied after the man’s circumcision, mainly because of better hygiene.

She and her colleagues have been studying a broad range of HIV-related matters since the late 1980s in the Rakai region of Uganda, where they founded the Rakai Health Sciences Program. The researchers made headlines several years ago with a study showing that circumcision dramatically reduced men’s chances of contracting HIV from infected female partners.

The Program provides thousands of circumcisions at no cost to men through PEPFAR funding. As a result, the site has what is possibly the world’s largest collection of foreskins, which are “immediately whisked away,” says Wawer, “because we do have a real kick-ass lab right there in rural Uganda.” The Rakai researchers are using the tissues to study how immune defenses in the mucous membranes protect the body from infections. Inadvertently, they are also discovering hundreds of new bacteria under the foreskins—enough that “everybody working on the project could probably have a bacterium named after them,” Wawer says. —Amy Dusto