

## Back to School, Safely

Speed bumps and high-visibility crosswalks near high-risk schools in the Big Apple reduce injuries by 44 percent.

**I**n 2005, Congress allocated \$612 million for a federal Safe Routes to School program to protect children biking and walking to school by a range of measures, from widening sidewalks and installing speed bumps to teaching kids about safety. In January 2013, *Pediatrics* published an analysis by Mailman School faculty showing that as a result, the annual rate of injury to school-age pedestrians fell 44 percent during the peak times for walking to school in New York City neighborhoods where the safety program was implemented. Significantly, the injury rate did not drop in parts of the city where the program was not in place.

“Our data show that interventions to make the built environment safer can greatly reduce injuries,” says lead author Charles J. DiMaggio, MPH ’93, PHD ’02, associate professor of Epidemiology and research director of the Center for Injury Epidemiology and Prevention at Columbia.

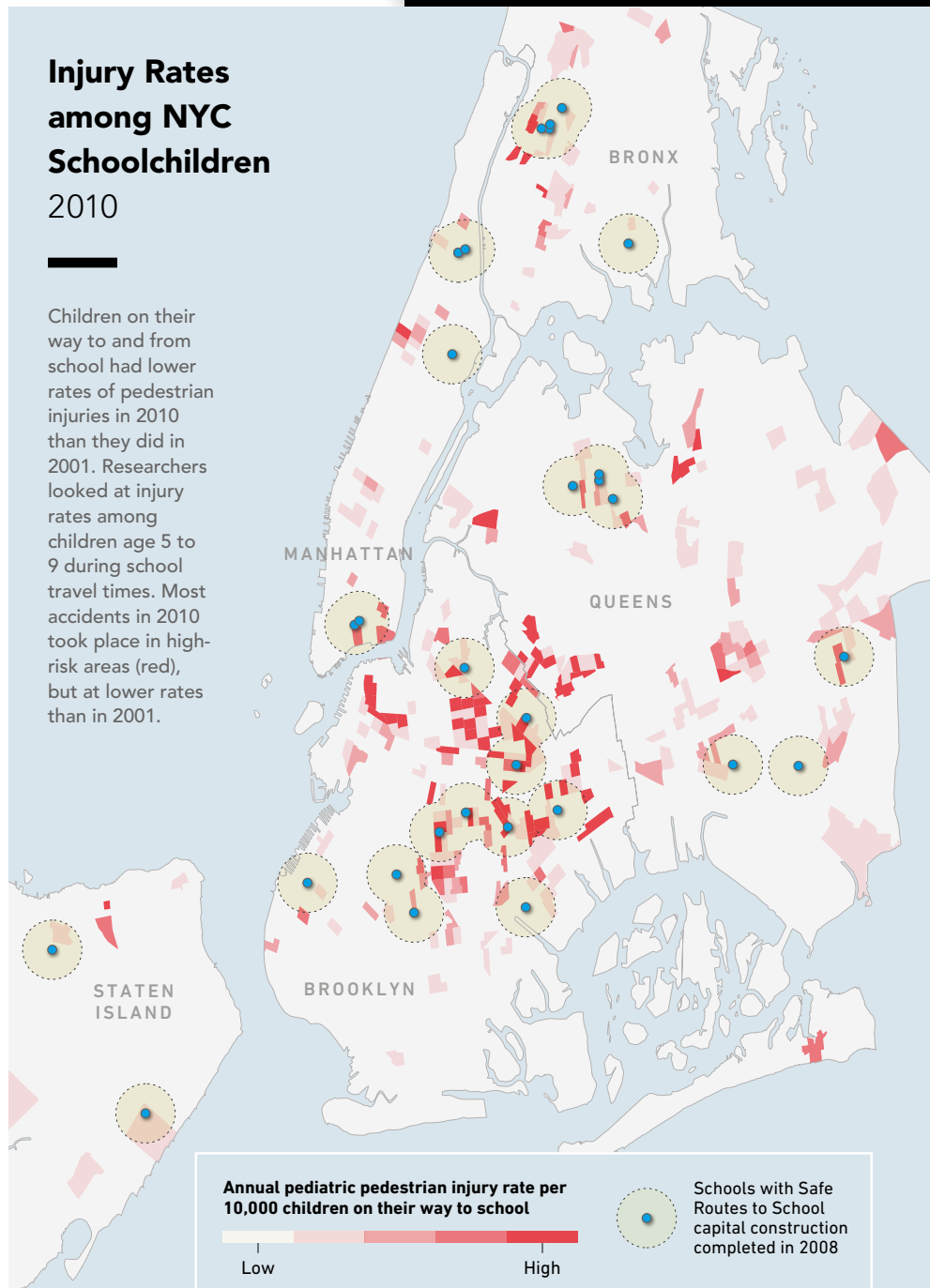
The Safe Routes to School program was funded through 2012 and is now in place in all 50 states, at approximately 10 percent of elementary and secondary schools. Under the federal transportation bill, MAP-21, the Safe Routes program will no longer have dedicated funding. For now, state and municipal officials will have to decide whether the program is a good choice for their constituents.

“Our study provides compelling empirical evidence that is essential to guiding policy makers,” says senior author Guohua Li, MD, PHD, Finster Professor of Epidemiology and Anesthesiology and director of the Center for Injury Epidemiology and Prevention. “The Safe Routes to School program has made a marked difference in improving the safety of school-age children in New York City.”

map by JONATHAN CORUM

### Injury Rates among NYC Schoolchildren 2010

Children on their way to and from school had lower rates of pedestrian injuries in 2010 than they did in 2001. Researchers looked at injury rates among children age 5 to 9 during school travel times. Most accidents in 2010 took place in high-risk areas (red), but at lower rates than in 2001.



# Mother's Milk

photo by KARL MUELLER

Study reveals that for moms with HIV, “breast is best” to protect baby from infection.

Because breast-feeding can transmit HIV, some health experts have suggested that weaning early could be advantageous. In a study designed to test that notion, Professor of Epidemiology Louise Kuhn, MPH '93, PhD, found that HIV-infected women in sub-Saharan Africa who fed their babies exclusively with breast milk for more than the first four months of life had the lowest risk of transmitting the virus to their babies through breast milk.

Women who stopped nursing earlier than four months had the highest concentrations of HIV in their breast milk. Those who continued to breast-feed, but not exclusively, had concentration levels in between the two practices.

“Our results have profound implications for prevention of mother-to-child HIV transmission programs in settings where breast-feeding is necessary to protect infant and maternal health,” says Kuhn, whose report appeared in *Science Translational Medicine*. “Our data demonstrate that early and abrupt weaning carries significant risks for infants. It suggests that HIV-positive women who want to breast-feed should do so exclusively for the first six months of the baby’s life and in most cases longer, while also being adherent to antiretroviral therapy. Weaning should be done slowly.”



## BPA & Asthma



Since its synthesis in a Russian laboratory in 1891, the compound bisphenol-a (BPA) has become ubiquitous in plastics manufacturing, appearing in everything from the lining of metal food cans to the thermal paper used for cash register receipts. In a study, published by the *Journal of Allergy and Clinical Immunology*, faculty in the Mailman School's Center for Children's Environmental Health have documented a link between exposure to BPA among young children and elevated risk for asthma in that population.

The study builds on evidence linking BPA exposure to respiratory symptoms, obesity, impaired glucose tolerance, and behavioral issues. In July, the Food and Drug Administration banned BPA in baby bottles and sippy cups. "It is very important to have solid epidemiologic research like ours to give the regulators the best possible information on which to base their decisions about the safety of BPA," says senior author Robin Whyatt, DRPH, professor of Environmental Health Sciences and deputy director of the Center for Children's Environmental Health.

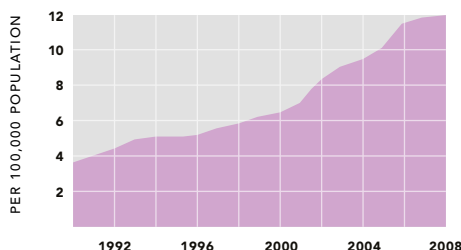
## LGBT Lifeline

Suicide is the third leading killer of youth 15–24 years old; lesbian, gay, and bisexual teens are between two and seven times more likely than their heterosexual peers to attempt suicide. A study of anti-bullying policies and adolescent suicide rates, published in the *Journal of Adolescent Health*, reveals that in counties where school anti-bullying policies include protection for sexual minorities, rates of suicide attempts by gay and lesbian teens are halved. The analysis was performed by Mark L. Hatzenbuehler, PhD, assistant professor of Sociomedical Sciences, and Katherine Keyes, MPH '06, PhD '10, assistant professor of Epidemiology.

# Opioid Epidemic

OVER THE PAST 20 YEARS, prescription drug overdoses have risen dramatically in the U.S. By 2006, such fatalities exceeded the number of suicides and by 2009, they outnumbered motor vehicle deaths as well. In New York City, the rate of drug overdose from prescription opioids increased sevenfold from 1990 to 2006, according to an investigation by Magdalena Cerdá, DRPH, assistant professor of Epidemiology, and coauthors. Most investigations of recreational opioid use have focused on rural areas, which have been hit hardest by the epidemic, but this study suggests that urban areas contend with a growing health burden. The analysis, published in *Drug and Alcohol Dependence*, suggests that the profile of a recreational prescription opioid user is very different from that of a heroin consumer, with less involvement in street-based forms of drug trafficking and use of other drugs such as cocaine. "It's a different type of drug with a different profile," says Cerdá, "and we need a different type of response to it."

DRUG OVERDOSE DEATH RATE



In 2008, the death rate attributed to drug overdose was 11.9 per 100,000 population. Of the 27,153 deaths in which a drug was specified, one or more prescription drugs were involved in 20,044 of the deaths. SOURCE: CDC

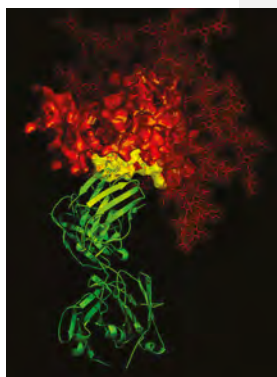




# Heavy Metal

**A MAILMAN SCHOOL STUDY REVEALS** that mice engineered with a human gene for schizophrenia and exposed to lead during early life exhibit behaviors and structural changes in their brains consistent with schizophrenia. Tomás R. Guilarte, PHD, Hess Professor and Chair of Environmental Health Sciences, was senior author of the paper, published in *Schizophrenia Bulletin*. Guilarte's findings suggests a synergistic effect between lead exposure and a genetic risk factor, and open an avenue to better understanding the gene-environment interactions that put people at risk for schizophrenia and other mental disorders. While the role of genes in mental disorders is well established, insight into the effect of toxic chemicals in the environment is just beginning to emerge. The study's results focus on schizophrenia, but implications could be broader. Says Guilarte: "We're just scratching the surface."

## New Clues in AIDS Vaccine Quest



3-D X-ray crystallographic image showing the broadly neutralizing antibody B12 (green ribbon) in contact with a critical target (yellow) for vaccine developers on HIV-1 gp120 (red).

rendering by NIAID

**TWO HIV-INFECTED** women from South Africa have revealed a vital clue in the search for an effective vaccine to halt AIDS. Antibodies isolated from one of the women were able to neutralize 88 percent of a large panel of HIV viruses. The other woman's antibodies neutralized 46 percent of the viruses against which they were tested.

"Broadly neutralizing antibodies are the key to making an AIDS vaccine," says Salim S. Abdool Karim, MD, PhD, director the Centre for the AIDS Programme of Research in South Africa (CAPRISA) and professor of clinical Epidemiology. "This discovery provides new clues on how vaccines could be designed to elicit broadly neutralizing antibodies. The world needs an effective AIDS vaccine to overcome the global scourge of AIDS."

While the existence of broadly neutralizing antibodies against HIV has been known for years, such antibodies were only isolated about three years ago. How they are produced remained a mystery until Abdool Karim and his associates—including Quarraisha Abdool Karim, PhD, associate professor of Epidemiology—published their findings in the journal *Nature Medicine*.

## FRAILTY

**EVERYONE OLDER THAN 70** should be checked for frailty, a treatable—and potentially deadly—condition. Geriatricians representing six major international and U.S. medical organizations made the case with other leading experts on aging in "Frailty Consensus: A Call to Action," published in the *Journal of the American Medical Directors Association*. Over the course of two decades of research and publication, Mailman School Dean Linda P. Fried, MD, MPH, and her team have led the science to characterize frailty as a medical condition. "With ever greater numbers of older persons, it is urgent that we confront the challenge of frailty by recognizing it as a medical condition that can be slowed and even reversed," says Fried, an author of the article. "Establishing a new clinical standard for screening for frailty will help preserve health and extend the lives of millions."

In 2001, Fried defined frailty as a clinical syndrome and proposed criteria to identify the potentially deadly condition.



## Of Vermin and Viruses

**H**igh-throughput sequencing and other molecular methods for pathogen discovery that were pioneered at the Mailman School's Center for Infection and Immunity have uncovered links between the viruses implicated in liver cancer and liver failure in humans and similar viruses common in bats and rodents.

In two papers published in the journals *mBio* and *Proceedings of the National Academy of Sciences*, investigators report the discovery of hepaciviruses and pegiviruses—close relatives of Hepatitis C (HCV)—in rodents and bats. The newly discovered viruses provide insights into the origins of HCV, as well as the mechanisms behind animal-to-human transmission. The findings may also enable development of new animal systems with which to model HCV pathogenesis, vaccine design, and treatment.

## HIV & MATRIMONY

In Uganda, the strongest predictor of HIV infection among young people ages 15–24 years old is previous marriage. The association is even stronger than having had multiple sexual partners or having recently consumed alcohol, each of which is associated with a tripling of the risk of infection. Among young men, whether the marriage ended due to divorce or death, HIV infection rates were ten times higher.

Contrary to some previous research, intact marriage was shown to be protective against infection. Also protective: being in school. The study will help inform HIV prevention programs to focus on school attendance, alcohol consumption, and multiple partners—and target previously married youth.

These and other insights were published in July by *JAIDS, the Journal of Acquired Immune Deficiency Syndromes*. John S. Santelli, MD, MPH, Heilbrunn Professor and Chair of Population and Family Health, was the lead author of “Behavioral, biological, and demographic risk and protective factors for new HIV infections among youth in Rakai, Uganda.” Data was collected from the long-running Rakai Community Cohort Study, a survey of nearly 16,000 youth in a southwestern district of the landlocked African nation, conducted from 1999 to 2008.



## Diet and Autism

A *Journal of the American Medical Association* study suggests that early in pregnancy, folic acid supplements reduce the risk of autism. Professor of Epidemiology Ezra S. Susser, MD, DrPH '92, is a joint senior author of the paper. The latest analysis of the Autism Birth Cohort—a sub-study of the Norwegian Mother and Child Cohort Study—tracked women's prenatal diets and later the emergence of autism spectrum disorders among their children. Women who took folic acid during the span from four weeks prior to eight weeks after the start of pregnancy had a 40 percent reduced risk of having children with the disorder compared with mothers who did not take the vitamin.