New York City house mice carry bacteria responsible for mild to life-threatening gastroenteritis in people, and some of these bacteria may be resistant to antibiotics, according to a report in *mBio* authored by W. Ian Lipkin, MD, the John Snow Professor of Epidemiology and director of the Center for Infection and Immunity (CII)—with scientists at CII and the Centers for Disease Control and Prevention.

Lipkin and colleagues at the CII collected 416 mice from residential buildings at seven sites across New York City over a period of one year. A genetic analysis of their droppings revealed that the mice carry several gastrointestinal disease-causing bacteria, including *C. difficile*, *E. coli*, *Shigella*, and *Salmonella*, a leading cause of bacterial food poisoning in the U.S., with 1.4 million reported cases annually along with 15,000 hospitalizations and 400 deaths. They also found evidence of genes mediating antimicrobial resistance to several common antibiotics.

A second study, also published in *mBio*, provides a detailed look at viruses present in the droppings. The researchers found 36 viruses, including six new viruses, none of which are known to infect humans. A previous study of rats in New York by investigators at CII found several of the same pathogens, including *E. coli*, *Salmonella*, and *C. difficile*. “New Yorkers tend to focus on rats because they are larger and we see them scurrying around in streets or subways,” says Lipkin, who is senior author of both papers.

“However, from a public health vantage point, mice are more worrisome because they live indoors and are more likely to contaminate our environment, even if we don’t see them.”
Clearing the Air

A new report on e-cigarettes from the National Academies of Sciences, Engineering, and Medicine offers the most comprehensive health assessment of the devices—alternately indicted as a gateway to addiction and championed as a tobacco cessation game-changer—to date.

“Over the last few years, there has been a proliferation of different kinds of e-cigarettes, as well as differences in how they are being used,” says Professor of Environmental Health Sciences Ana Navas-Acien, one of the report’s expert authors. Navas-Acien is an authority on the link between exposure to metals—a potential risk with the heated coils used in the devices—and risk for diabetes and heart disease, as well as in measuring exposure to secondhand smoke. The report—which compiles results from more than 800 scholarly analyses, as well as testimony from industry, retailers, and users—hardly the final word on e-cigarettes, says Navas-Acien. “There is a lot of high-quality science we still have to do.”

Bio Burden

For nearly a decade, scientists have attributed inconsistent outcomes associated with tenofovir, a microbicidal gel used to prevent HIV, to variability in individual use. Research by scientists at the Centre for the AIDS Programme of Research in South Africa (CAPRISA) and the Columbia Mailman School, published in Nature Medicine, shows that biological factors also affect tenofovir’s efficacy. Genital inflammation significantly increases the risk of HIV infection, independent of the consistency with which a person uses the microbicide for topical pre-exposure prophylaxis (PrEP). “This study gives us an important clue to enhance HIV prevention,” says senior author Salim Abdool Karim, PhD, director of CAPRISA and a professor of Epidemiology. “It is not only adherence-related behaviors but also biological processes in the vagina that need to be addressed to prevent HIV and enhance the effectiveness of topical PrEP.”
Aging Well

A team led by John Rowe, MD, Julius B. Richmond Professor of Health Policy and Aging, has developed a barometer that estimates how countries are adapting to the dramatic increases in the number and proportion of older persons. Named for the agency that funded the effort, the John A. Hartford Foundation Index of Societal Aging comprises five social and economic indicators that reflect the well-being of older persons in 30 countries and which can be followed over time and compared across nations. “Now that previously unimagined numbers of older persons are living longer,” says Rowe, “it is critical that we shift from our prior sole focus on the characteristics of individuals and their immediate environments to one that includes a strategy for the entire society to successfully adapt to an aging population.”

Heart-Healthy: A Mayor’s Legacy

Health promotion was a significant legislative focus of New York City Mayor Michael Bloomberg, whose three terms in office exemplified a “health in all policies” approach to everything from heating fuel and transportation regulations to cigarette tax rates.

In an analysis in Cities and Health, a team of Columbia Mailman School researchers in Epidemiology, Sociomedical Sciences, and Health Policy and Management reports that 7.4 percent of the 3,745 pieces of legislation introduced during the Bloomberg administration had the potential to impact New Yorkers’ cardiovascular health, coinciding with a local decline in heart disease not observed on the national level. The team focused on four factors associated with cardiovascular health: air pollution exposure, physical activity, dietary intake, and tobacco smoke exposure, which is the risk factor most targeted by legislative efforts.

“Over the past 15 years, there has been growing attention to a ‘health in all policies’ approach by local, regional, and national governments to improve the well-being of all communities and people,” says first author Brennan Rhodes-Bratton, MPH, a doctoral candidate in the Department of Sociomedical Sciences.

“Local health promotion efforts and multi-sectoral municipal policies have the potential to efficiently reach large numbers of urban residents and impact their health.”
Highway to Health

The 6.5-mile Cross-Bronx Expressway cuts through neighborhoods with some of the worst air pollution and highest rates of diabetes, obesity, and asthma in New York City. Building a park on a deck above the highway could turn those numbers around.

In a paper published in the *American Journal of Public Health*, a team led by Peter Muennig, MD, MPH ’98, a professor of Health Policy and Management, and developed in the School’s Global Research Analytics for Population Health (GRAPH) details how a 2.4-mile span of green space would benefit each of the 226,608 people living nearby both in terms of life expectancy and monetary gains. Improved health and longevity resulted from fewer pedestrian accidents, reduced pollution, and increased exercise options. As a result, each resident would gain nearly two months of quality-adjusted life years, a combined measure of health and longevity. In the simulation, monetary gains—$1,629 per person, mainly from increased property values—more than made up for the project’s steep price tag, estimated at $757 million. “It is extremely rare for social policy investments to save both money and lives,” says Muennig.

“Turning a highway into a park is a bit like a seatbelt or vaccine for a whole neighborhood.”

Safer Sex

Preliminary reports from the Sexual Health Initiative to Foster Transformation (SHIFT), a major study of sexual assault and sexual health among Columbia University and Barnard College undergraduates, have been published in *PLOS ONE*, *Trauma, Violence, and Abuse*, and *Global Public Health*. “SHIFT helps us think more critically about how to create healthier communities on college campuses,” says SHIFT co-director Jennifer S. Hirsch, PhD, a professor of Sociomedical Sciences. “To address campus sexual assault, we need a systems-based public health approach that recognizes the multiple power asymmetries that create vulnerability to assault. Preventive programming should address the drivers of widespread use of alcohol, but we also need a life-course perspective. Most parents spend more time talking with their children about how to cross the street safely, or about choosing healthy foods, than about sex as a normal part of a satisfying life.”

Smoke Signals

LEGALIZATION OF MEDICAL MARIJUANA—NOW SANCTIONED IN 29 STATES—HAS NOT BEEN ASSOCIATED WITH AN UPTICK IN RECREATIONAL USE OF THE SUBSTANCE AMONG U.S. ADOLESCENTS, ACCORDING TO A STUDY BY DEBORAH HASIN, PHD, PROFESSOR OF EPIDEMIOLOGY. The researchers analyzed the results of eleven separate studies dating back to 1991 using data from four large-scale U.S. surveys. No significant changes, increases, or decreases occurred in adolescent recreational use following enactment of medical marijuana laws. A separate analysis in *Prevention Science* by Christine Mauro, PhD, assistant professor of Biostatistics, showed that daily use of marijuana as well as past month rates rose for both men and women aged 26 and older in states with medical marijuana laws in effect. “The $8 billion cannabis industry anticipates tripling by 2025,” says Hasin. “Obtaining a solid evidence base about harmful as well as beneficial effects of medical and recreational marijuana laws on adults is crucial given the intense economic pressures to expand cannabis markets.”

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Beginning in the 1970s, manufacturers added polybrominated diphenyl ethers (PBDEs) to couches, textiles, electronics, and other consumer products as flame retardants. Due to their persistence in the environment and evidence of human health effects, they were phased out beginning in 2004, with newer flame retardants—whose health effects are unknown—taking their place.

Two studies from the Columbia Center for Children’s Environmental Health—published in the Journal of Exposure Science and Environmental Epidemiology and in Emerging Contaminants—detail the persistence of PBDEs in children’s bloodstreams and confirm that toddlers have the highest exposure to flame retardants, likely because of the amount of time they spend on the floor.

“These findings reinforce the decision to phase out PBDEs from consumer products,” says senior author Julie Herbstman, PhD, associate professor of Environmental Health Sciences. “However, it’s important to remain vigilant. Since the phase-out of PBDEs, we have begun to detect in children other flame-retardant chemicals, which are likely being used as replacements.”