Follow the Money

When President Donald Trump submitted his first budget to Congress, he proposed a reduction of nearly 20 percent—$6 billion—in 2018 funding for the National Institutes of Health. Such belt-tightening carries a cost, says Bhaven Sampat, PhD, associate professor of Health Policy and Management, whose analysis shows that three percent of all NIH-funded grants produce research that is subsequently cited by a private-sector patent. Science published the resulting paper, co-authored with collaborators at Harvard Business School, MIT Sloan School of Management, and the National Bureau of Economic Research.

The NIH, the world’s largest single funder of research in the life sciences, provides support for one-third of biomedical research and development in the U.S. as well as the majority of funding for basic biomedical research.

The team found that such publicly funded inquiry yields insights that spur efforts by private companies to develop drugs, medical devices, and other patented biomedical products.

In addition to their analysis of the output of research grants awarded by the NIH over a 27-year period, the team also reported their novel method to reveal links between public research investments and their commercial applications.

They also examined linkages between NIH grants and patents associated with marketed drugs. They found that about 10 percent of NIH grants directly generate a patent. Another 30 percent yield articles that are subsequently cited by commercial patents. “Focusing solely on the direct patent output of NIH funding,” the authors write, “may dramatically understate its importance for producing research that informs commercial innovation.”
Immune Response

Scientists at the Mailman School’s Center for Infection and Immunity (CII) have discovered immune signatures differentiating two subgroups of myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS). This complex, debilitating disease is characterized by symptoms including extreme fatigue after exertion, difficulty concentrating, headaches, and muscle pain. In “classical” ME/CFS, symptoms begin suddenly following a flu-like infection. However, a subset of cases classified by the investigators as “atypical” follow a different disease course, either from triggers preceding symptoms by months or years, or accompanied by the later development of additional serious illnesses. The study, published in Translational Psychiatry, may help clinicians personalize treatment for people with ME/CFS.

A second CII paper on ME/CFS reports abnormal levels of specific gut bacteria related to ME/CFS in patients with and without concurrent irritable bowel syndrome (IBS), which affects up to 90 percent of ME/CFS patients. The study, published in Microbiome, is among the first to unravel imbalances in the gut bacteria of people with ME/CFS and IBS.

Death and Taxes

Since its inception, the earned income tax credit (EITC) program has lifted 9 million Americans out of poverty. The EITC is good for people’s pocketbooks and even better for their health, according to research by Peter Muennig, MD, MPH ’98, professor of Health Policy and Management, and colleagues, in the American Journal of Preventive Medicine. The team showed that EITC is much more cost-effective than many health interventions. They further documented its effect of reversing mortality trends among Americans with low incomes in some states that have been experiencing increases in mortality in recent years. “EITC might just be the bipartisan answer to both the problems of declining life expectancy and declining wages among lower-income Americans,” says Muennig. “But we still need experiments to be sure that it really does what we think it does.”

Abundance Amidst Scarcity

In the report Strong at the Broken Places: The Resiliency of Low-Income Parents, the Mailman School’s National Center for Children in Poverty (NCCP) documents the strengths and coping skills of participants in the Fragile Families and Child Well-Being Study. Children who reported high levels of parental involvement and supervision were more likely to also report behaviors associated with positive emotional development and social growth. The study shows that parents with low incomes help their families flourish amidst the environmental stressors associated with poverty. “They raise children who possess the social-emotional competence needed to develop and keep friendships; establish good relationships with parents, teachers, and other adults; and experience a range of achievements that contribute to their self-confidence, self-esteem, and self-efficacy,” says report co-author Renée Wilson-Simmons, DrPH, director of the NCCP.

“These families have something to teach us all about thriving amidst adversity.”
Building an evidence-based understanding of addiction is a critical piece of the Mailman School’s mission, particularly in light of the nationwide epidemic resulting from the converging economic, legal, and social dimensions of substance use.

Epidemiologists Deborah Hasin, PhD, and Silvia Martins, PhD, continued their scrutiny of marijuana and opioids over the past year, collecting data to inform legislators intent on crafting evidence-based policy, and program managers committed to tailoring interventions for optimal effect. Much of the research explores the impact of rapidly changing state-by-state legislation governing the sale and use of both medical and recreational marijuana.

Hasin compiled a series of comparative analyses—published in *JAMA*, *JAMA Pediatrics*, and *JAMA Psychiatry*—investigating differences in cannabis use and abuse by gender, age, and socio-economic status, as well as the effect of medical marijuana legislation on behavior and attitudes. In another analysis, published by *Drug and Alcohol Dependence*, her team found that the gender gap has widened. More men reported past-year use than women, and since 2007, the rate of increase was greater for men than for women. The researchers also found that the trend was driven solely by households earning less than $50,000 a year.

Martins investigated an array of substances and their use at work and on the road. In the *American Journal of Public Health*, she reports that, on average, states which had enacted medical marijuana laws experienced reductions in traffic fatalities. *Addiction* published her finding that marijuana use varies widely by geography, with adult usage rising significantly in states that passed loosely regulated medical marijuana laws. Her report in *Social Psychiatry and Psychiatric Epidemiology* details the relationship between employment status and nonmedical prescription drug use among people over the age of 25. Unemployed workers had the highest risk of misusing prescription opioids. By contrast, those out of the workforce entirely were most at risk for misusing prescription stimulants. In *JAMA Psychiatry*, Martins quantified the increase among American adults in heroin use and associated disorders since 2001: Clinically defined addiction has tripled. Increases were greatest among males, whites, and those with low incomes and little education. The rise in the prevalence of heroin use disorder was more pronounced among whites ages 18–44 than among nonwhites and older adults.
The Reformation

Even as political rhetoric over the Affordable Care Act (ACA) flared, Health Policy and Management faculty continued analyzing outcomes of the law and documenting Americans’ attitudes toward health insurance reform.

In a *Health Affairs* report, Assistant Professor Adam Sacarny, PhD, examines how personalized letters and emails might encourage enrollees in the ACA marketplaces to shop for health insurance plans that save them money and better meet their needs. The study was a randomized controlled trial involving 15,000 households in Colorado. “While we can say with confidence that the messages encouraged people to shop,” says Sacarny, “the results also show that simply increasing awareness may not lead consumers to change plans.”

In March, Professor Peter Muennig, MD, MPH, and colleagues released the results of a survey on healthcare affordability. In response to the speed with which a legislative overhaul was being pursued in Congress, the team published on *SocArXiv*, a website for the rapid dissemination of science, rather than in a traditional health policy journal. “Americans feel that everyone can afford to put about 5 percent of their household income toward health insurance and strongly favor a credit linked to the income that one makes,” says Muennig. “They also do not favor placing extra burdens on the sick or elderly.”

Assistant Professor John McHugh, MBA, PhD, whose work melds strategic consulting and entrepreneurship, turned his eye to the networks of providers known as Accountable Care Organizations (ACO), conceived to coordinate care and boost quality while containing costs. His *Health Affairs* report showed that ACO member hospitals reduced readmission rates faster than their non-ACO peers. “There’s a real need within the research community to accelerate, to look at the incentive programs to understand what’s working, and speak up about them,” says McHugh. “Make sure voices are heard, that evidence is known and followed, and keep fighting.”

Teen Talk

With 1.8 billion teens worldwide, the time is ripe for better data on adolescent health. To facilitate research, John Santelli, MD, MPH, professor of Population and Family Health, serves as editor of a series of UNICEF briefs that examine a variety of challenges facing investigators, including practical considerations about data sources and ethical concerns. In a separate paper in the *Journal of Adolescent Health*, Santelli and co-authors credit such economic trends as rising national wealth and expenditures on education for declining rates of adolescent fertility, which dropped by 40 percent from 1990 to 2012, worldwide.

Sadly, the news for young women isn’t all good. Marni Sommer, DrPH, associate professor of Sociomedical Sciences, has found that, like girls in higher-income nations, girls in less economically developed nations are more likely to have sex, take sexual risks, and marry young if they menstruate early. Stateside, Sommer reports, girls from low-income families are unprepared for puberty and have largely negative experiences of the transition. In the *Journal of Global Health*, Lindsay Stark, MPH, DrPH, associate professor of Population and Family Health, documents widespread violence against teen girls in Africa.
Against Medical Advice

In an op-ed for the *New England Journal of Medicine*, public health historian James Colgrove, MPH ’01, PhD ’04, professor of Sociomedical Sciences, reflects on the mix of coercion and persuasion that has characterized vaccination campaigns since the 19th century, when state and local governments struggled to protect Americans from smallpox.

Today, vaccine promotion is complicated by the Internet and social media, which make it possible for any one viewpoint, whether scientifically accurate or not, to gain traction. Trying to counter misinformation can have a boomerang effect, says Colgrove: The more health officials push back, the more likely a bogus theory is to stick in people’s minds.

With vaccination rates falling, some parts of the country have seen a return of more coercive tactics. California, for example, has outlawed nonmedical exemptions from childhood vaccinations.

Colgrove champions education and training, especially for primary care providers, the key influencers when people are making decisions about vaccinations. “It’s a challenge,” the scholar says, “but also an opportunity.”

Risk Assessment: Autism

Three papers from the Mailman School’s Center for Infection and Immunity (CII) explore the association of prenatal events with the risk of a child being diagnosed with autism spectrum disorder (ASD). Fever during pregnancy may raise the risk for ASD, according to a *Molecular Psychiatry* report. In an *mSphere* paper, researchers detail mixed evidence of a link between maternal influenza and ASD. A second *mSphere* paper reports that women actively infected with genital herpes (HSV-2) during early pregnancy have twice the odds of giving birth to a child later diagnosed with ASD.

A study unrelated to the CII investigations, by Professor of Epidemiology Guohua Li, DrPH, MD, reveals that deaths of people with autism had increased 700 percent in the past 16 years and, compared with the general population, were three times as likely to have been caused by injuries.

Sports Medicine

Children from urban areas of New York City who engaged in vigorous daily exercise had greater exposure to black carbon, a traffic-related pollutant, than children who were less active, according to a study by a joint team of researchers from the Mailman School and Columbia’s College of Physicians & Surgeons, published in the journal *Environmental Research*.

“This study’s findings clearly add to evidence that physical activity may benefit the respiratory health of children,” says Rachel Miller, MD, professor of Environmental Health Sciences and professor of Medicine (in Pediatrics) at CUMC. “But exposure to high levels of black carbon may lessen this effect.”