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INSIDE THIS ISSUE

Consumers' Fear of Virus Outweighs Lockdown's Impact on Business

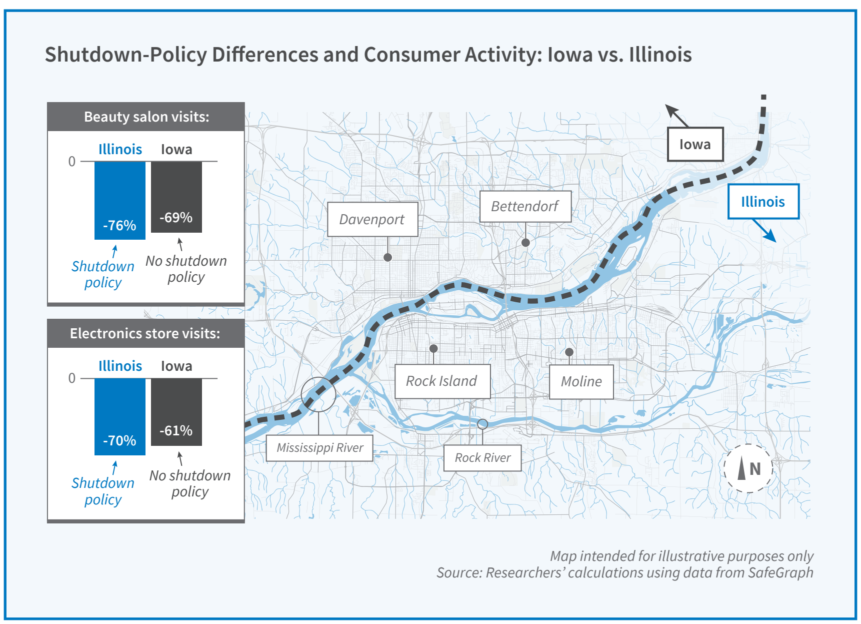
Government policies restricting business operations and personal mobility were less important than consumers' self-imposed limitations in contributing to the steep drop in economic activity during the early months of the COVID-19 pandemic, according to findings presented in **Fear, Lockdown, and Diversion: Comparing Drivers of Pandemic Economic Decline 2020** (NBER Working Paper 27432). Voluntary behavioral changes occurred because of consumers' fears of catching the virus, researchers Austan Goolsbee and Chad Syverson show. They conclude that repealing restrictions is not a particularly powerful tool for restarting growth so long as individuals continue to fear infection.

The researchers draw on cellphone data tracking consumer visits to 2.25 million individual businesses nationwide from March 1 to May 16. They isolate the impact of shutdowns by comparing foot traffic across businesses within commuting zones that span counties subject to differing legal restrictions on consumer and business activity. Commuting zones consist of counties or clusters of counties that delineate local economies.

Within commuting zones, businesses in counties without shelter-in-place orders experienced drops in customer activity similar to those of businesses in counties covered by shelter-in-place rules. The decline for businesses in counties with restrictions was only 10 percent larger than it was for their counterparts in counties without restrictions.

> Similar businesses suffered similar declines in customer visits, regardless of whether they were in counties covered by shelter-in-place orders.

By comparing counties with and without restrictions, the researchers conclude that only 7 percentage points of the 60 percentage point overall decline in business activity can be attributed to legal restrictions. Most of the decline resulted from consumers voluntarily choosing to avoid stores and restaurants. The results were similar regardless of whether differences in restrictions arose because neighboring counties within a commuter zone shut down at different times or because some counties shut down while their neighbors did not. Consumer traffic began to decline before legal restrictions were imposed and was closely correlated with the number of local COVID-19 deaths.



The researchers also find that to avoid crowds, consumers shifted from larger to smaller establishments. Comparing business traffic in January with that during the week of April 12—the low point for economic activity in the sample—they found that activity was down 70 percent at establishments in the top quintile in size for their industry, compared with 45 percent for those in the bottom fifth. The shift away from larger businesses was more pronounced in communities harder hit by the disease.

Reflecting the findings that consumer self-protection rather than legislated restrictions most affected consumer behavior, the researchers caution that lifting lockdowns could have the unintended effect of discouraging consumer spending. "If repealing lockdowns leads to a fast enough increase in COVID infections and deaths and a concomitant withdrawal of consumers from the marketplace, they might ultimately end up harming business activity."

—Steve Maas

Inflation Measurement in the Era of COVID-19

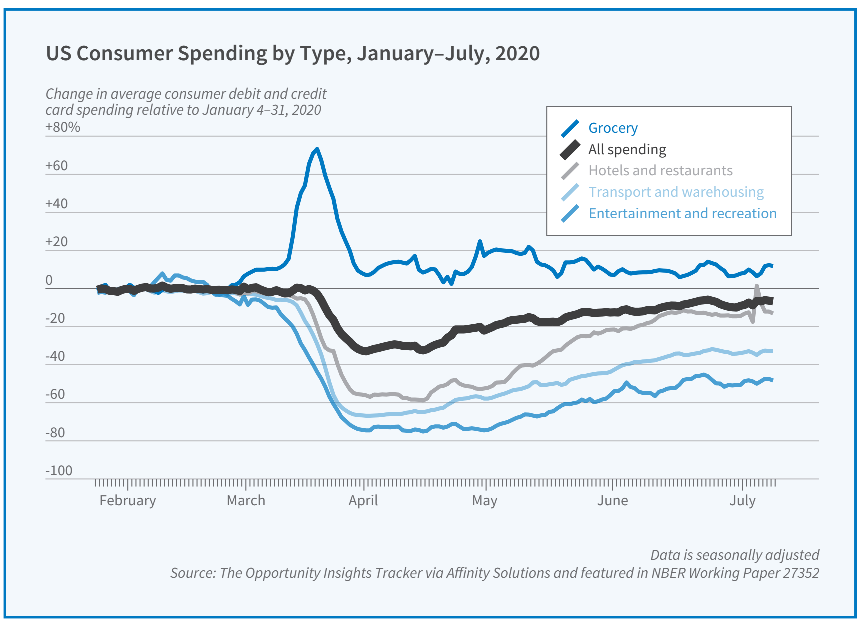
The US Consumer Price Index (CPI) may understate the rate of inflation during the COVID-19 crisis because it does not reflect pandemic-induced shifts in spending patterns, according to findings reported in **Inflation with COVID Consumption Baskets** (NBER Working Paper 27352).

Since the start of the pandemic, consumers have reduced spending on transportation, hotels, dining out, and recreation, and spent more on groceries and beverages, than in past years. But the weights of different spending categories in the CPI, which reflect the relative significance of a category of goods and services as measured by its share of total household consumption, were last adjusted by the US Bureau of Labor Statistics in December 2019. That update was based on data from the previous two years.

Alberto Cavallo constructed updated weights using data from US credit and debit card transactions for the first four months of 2020. The impact of the virus did not become pronounced until the last two months of the study period. By April, two categories—"food at home" and "transportation"—diverged substantially from the current CPI weights. Using the updated weights, the researcher re-computes the US inflation rate. He estimates that, as of April 2020, the annual inflation rate in the United States was 1.06 percent, as compared with 0.35 percent as reported by the CPI.

"Food at home" costs, which rose by 2.7 percent in April, had a much smaller impact on the official CPI, where the category weight was 7.6 percent, than on the COVID-updated CPI, where the weight was 11.3 percent. In contrast, April's 5 percent decline in transportation costs had a much greater effect on the official CPI, where the category weight was 15.8 percent, than on the COVID CPI, where the weight was just 6.3 percent, reflecting shelter-in-place orders.

Spending on 'food at home' is up and spending for 'transportation' is down as a result of the pandemic, but the CPI weights of these categories are unchanged.



Consumers spent relatively more on the categories of "housing" and "education and communication" in the wake of the pandemic, but that had a negligible impact on the gap between the official CPI and the COVID CPI because inflation was nearly zero in those sectors in April.

The study projects that the pandemic will continue to increase the cost of living for the average US consumer, with the gap between the official CPI and the COVID-19 index widening as new social-distancing measures shift spending away from categories experiencing minimal inflation, if not deflation, and toward those where prices are rising at a more rapid clip.

Cavallo also constructed COVID CPI indexes for 16 other countries, assuming that the changes in spending patterns in those countries mirrored those in the US. He found that in 10 of the 16 countries, inflation rates during the pandemic were higher than the official rates.

In the other six countries, inflation rates during the pandemic were lower because spending shifts coincided with favorable price movements in individual CPI sectors. In Germany, for example, a 4.2 percent inflation rate in the "recreation and culture" category registered much more in the official CPI than it did in the COVID CPI, where that sector carried less weight. The fact that those nations have seen a decline in inflation underscores that calculating the impact of COVID-19 requires not just accounting for shifts in consumer spending patterns but also for divergent changes in inflation rates among spending categories.

—Steve Maas

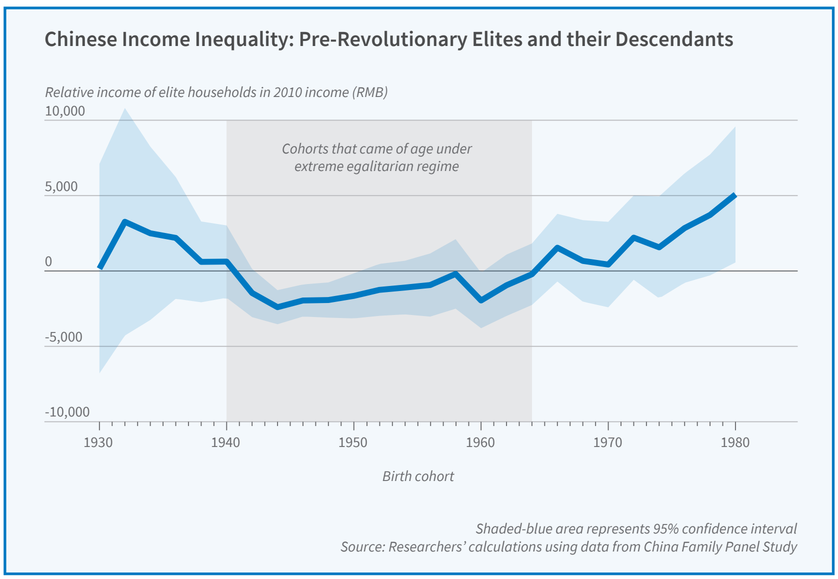
Riches to Rags and Back Again: The Impact of China's Revolutions

Guangyu Huang's grandfather was a rich landlord in Guangdong, China, who lost most of his land and assets during the Communist Revolution of the 1950s. Huang's father, who grew up in the midst of that revolution and the Cultural Revolution that followed in 1966–76, received no inheritance, had no formal education, and eked out a living extracting persimmon oil. Huang spent his childhood collecting trash to survive, then won admission to a prestigious university and founded GOME Electronics. Today he is one of the richest men in China.

Huang's story is both an inspiring rags-to-riches tale and an example of the persistent multigenerational transfer of values and attitudes that enable the accumulation of wealth, Alberto F. Alesina, Marlon Seror, David Y. Yang, Yang You, and Weihong Zeng argue in **Persistence through Revolutions** (NBER Working Paper 27053). The researchers investigate whether the Communist Revolution and Cultural Revolution, during which land and assets were redistributed and higher education was suspended in an effort to permanently eliminate inequality, succeeded in putting all citizens on an equal footing, and whether the effect of the revolutions persisted after China adopted market-oriented reforms and accepted greater inequality.

Using archival data on land holdings as well as census and survey data, they first confirm that China's revolutions initially succeeded in largely eradicating inequality. They find that the Communist Revolution eliminated wide disparities in landholding as well as educational inequality. Prior to the revolutions, elite citizens (those from households of landlords and rich peasants) were more than twice as likely to have finished secondary school; after the reforms, the children of formerly elite households obtained less education than their non-elite peers. Similarly, the children of formerly elite households went on to earn 18 percent less annually than the children of non-elite families.

> One of the most extreme attempts in history to eliminate advantages of the elite and eradicate economic and educational inequality succeeded only in the short term.



But while the revolutions eliminated inequality among the children of households that were elite before the reforms, a different narrative emerges in the next generation—the grandchildren of formerly elite families. These individuals, who grew up with a different set of institutions that accept greater inequality, perform better on math evaluations and complete more education—about 10 percent more years of school—than the grandchildren of non-elites. They also earn more money, about 16 percent more a year. Intergenerational mobility in China today is roughly on par with, if not slightly higher than, that in the US and Canada. The grandchildren of formerly elite Chinese landowners have a 14.5 percent chance of remaining in the top decile of earners; in the US and Canada, the descendants of top-decile earners have, respectively, a 14.1 percent and 11.1 percent chance of remaining in that top decile.

The researchers investigate the intergenerational transmission of key values as a potential explanation for such persistence. They find that the grandchildren of elite families are less averse to inequality, more individualistic, and more likely to consider effort as important to success. They also find that these grandchildren work substantially more hours. Notably, these trends are strongest among people who live with their parents, and are nonexistent among those whose parents died young, suggesting that formerly elite families may have passed down critical values at home to ensure their family members thrive. The researchers conclude that "the cultural transmission within the family seems to have survived extraordinarily broad and deep institutional and political changes, with an extraordinary resilience."

—Dwyer Gunn

Disruptions in Education Stunt Innovation in the Long Term

As part of his Great Proletarian Cultural Revolution, Mao Zedong shut down China's universities and colleges from 1966 to 1976. High school graduates were sent to work on farms and in factories, and many never again saw the inside of a classroom.

In **Education and Innovation: The Long Shadow of the Cultural Revolution** (NBER Working Paper 27107), Zhangkai Huang, Gordon M. Phillips, Jialun Yang, and Yi Zhang use this tumultuous period in Chinese history to illuminate how disruptions in schooling can negatively affect an economy's long-term growth and innovation. They find that Chinese firms led by CEOs who lack college degrees are less innovative than those with CEOs who are college graduates.

The researchers gauge a company's commitment to research by the ratio of its R&D investment to its total assets. Among firms led by CEOs with college degrees, the R&D/assets ratio averaged 16.6 percent higher than it did among companies with less educated CEOs. College-educated CEOs, they find, "value research and innovation more, given they themselves have received a college education and may have more specific technical knowledge or know more about the importance of R&D."

The study's sample consists of companies listed on China's two major stock exchanges for the period 2008–16. The median age of CEOs in the sample is 55, making it likely that they were born between 1948 and 1959 and graduated from high school during the Cultural Revolution.

A decade of upheaval that brought traditional education to a standstill birthed a cohort of Chinese CEOs less inclined to spend on R&D.

Most Chinese in that cohort lost the opportunity to attend college. By the end of the upheaval, they either had families to support or were squeezed out of the relatively few available college slots by a new generation of high school graduates. The revolution decimated the ranks of faculty and scientific researchers, reducing admission and research capacity. The disruption in education was so stark that the age of a CEO can serve as a proxy for educational status in predicting a firm's level of innovation.

The researchers use multiple approaches to control for the possibility that firms hire CEOs with or without a college degree based in part on their innovation opportunities. They conclude that Chinese firms led by CEOs without a college degree spend less on R&D, generate fewer patents, and receive fewer citations to these patents.

—Steve Maas

California's Carbon Market Cuts Inequality in Air Pollution Exposure

California's greenhouse gas cap-and-trade program has narrowed the disparity in local air pollution exposure between disadvantaged and other communities. That is the finding of **Do Environmental Markets Cause Environmental Injustice? Evidence from California's Carbon Market** (NBER Working Paper 27205), a study by Danae Hernandez-Cortes and Kyle C. Meng. The results do not support concerns, raised prior to the policy's enactment, that the market forces introduced by the program could worsen an existing pattern in which disadvantaged neighborhoods are more exposed to pollution than their better-off counterparts.

California's law caps total annual emissions of greenhouse gases. The initial cap, which was set to decline each year, aimed to reduce statewide greenhouse-gas emissions to 1990 levels by the year 2020. That goal was achieved by 2016, leading California to set a 2030 target at 60 percent of the 1990 levels.

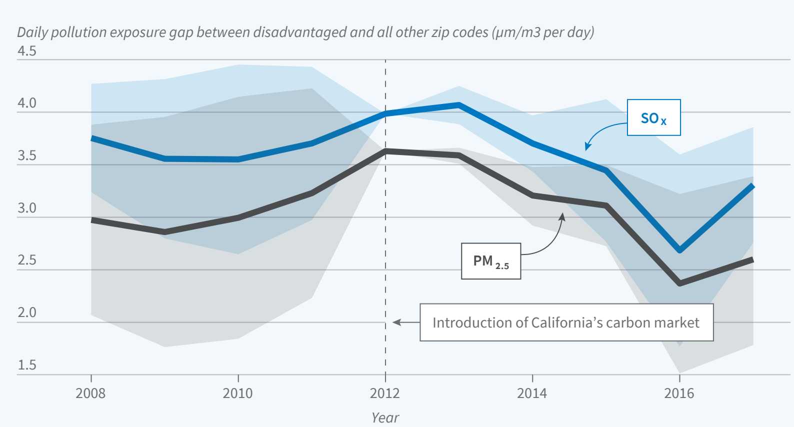
The program regulates most major stationary greenhouse gas-emitting sources, including utilities and industries. By creating a market in tradeable emission rights, it puts a price on greenhouse gas emissions and thereby encourages emitters to invest in abatement measures. When a polluter's marginal cost of reducing emissions is relatively steep, it may find it cheaper to buy emission permits or carbon offsets than to lower emissions. By leveraging market forces to shift emission cuts from high to low abatement cost polluters, cap-and-trade can be more cost-effective than imposing uniform regulations on diverse industries.

The gap in pollution exposure between disadvantaged and other communities narrowed by 21 percent for nitrogen dioxide, 24 percent for sulfur dioxide, and 30 percent for particulates following introduction of cap and trade.

However, these same market forces also alter where pollution is generated, and thus who may be harmed by it, in ways that can either exacerbate or lessen existing inequities in pollution exposure.

The study analyzes emissions from some 300 facilities over the 2008–17 period to determine how the greenhouse gas limitations affected exposure to emissions of local air pollutants across disadvantaged and other communities in California. The researchers embed an atmospheric transport model into their program evaluation framework

California's Carbon Market and the Pollution Exposure Gap



Shaded areas represents 95% confidence intervals
Senate Bill 535 defines a "disadvantaged" zipcode using a scoring system developed by the California EPA
Source: Researchers' calculations using data from the California Air Resources Board

to track the dispersal of pollutants, accounting for geography, wind patterns, (insert comma) and smokestack height. They find that between 2012, the year before the program took effect, and 2017, the disparity in pollution exposure between disadvantaged and other communities, which the researchers label the environmental justice gap, narrowed. The gap in concentrations of nitrogen dioxide declined by 21 percent. The decline was 24 percent for sulfur dioxide and 30 percent for particulate matter. These declines reversed a trend of widening disparity prior to the program's onset.

California's cap-and-trade program is the second largest carbon market in the world — after that of the European Union — as measured by the total value of permits. However, as the researchers caution, the California findings may not necessarily generalize to other environmental markets. In settings where disadvantaged communities are downwind from polluters with high costs of cutting emissions, an environmental market could widen the environmental justice gap.

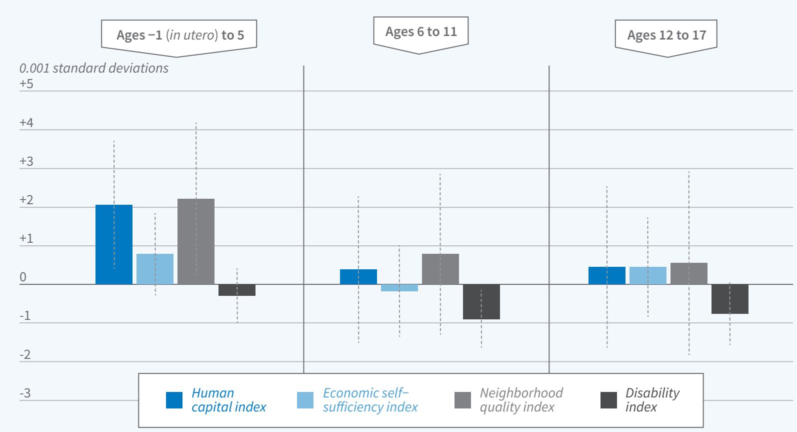
— Steve Maas

Effects of Food Stamp Availability for Families of Young Children

Estimates of the long-term benefits of the SNAP program suggest that food stamps are a cost-effective use of public funds.

Providing access to food stamps for pregnant women and families with children under age five is associated with substantial subsequent gains in productivity, economic self-sufficiency, neighborhood quality, and physical health for those children when they reach adulthood. This is the central finding of Martha J. Bailey, Hilary W. Hoynes, Maya Rossin-Slater, and Reed Walker's new study, **Is the Social Safety Net a Long-Term Investment? Large-Scale Evidence from the Food Stamps Program** (NBER Working Paper 26942), which offers a comprehensive analysis of the long-term consequences of program access.

The US Food Stamp Program and Children's Outcomes by Age at Program Launch



Thin dashed lines represent 95% confidence intervals.
The figure plots the marginal effect of one more year of exposure to food stamps. The estimates are allowed to vary across age ranges.
Source: Researchers' calculations using data from the US Census Bureau, the Social Security Administration, and other sources.

Food stamps, known today as the Supplemental Nutrition Assistance Program (SNAP), were launched during President Lyndon B. Johnson's War on Poverty and introduced nationwide between 1961 and 1975 to provide low-income families with food resources. Currently, SNAP is the second-largest anti-poverty program for children in the United States. Roughly one-third of Americans living in poverty are children.

This study examines the effects of food stamps access in early childhood on individuals' long-term well-being, using data on 17.5 million Americans between the ages of 25 and 54. The data include people who were children before, during, and after the introduction of food stamps — which occurred on a county-by-county basis — and who were also present in the 2000 Census or the 2001–13 American Community Surveys. The researchers linked these data to the Social Security Administration's files containing information on individuals' counties and dates of birth, enabling them to measure food stamps access. The study estimates long-term effects by focusing on whether a child had access to food stamps at different ages in the county of birth — rather than whether the child participated in the program.

The key finding is that a composite index of well-being for adults with access to food stamps throughout childhood is 0.009 standard deviations higher than the corresponding index for those without access. This index includes four components. First is an individual productivity and human capital index, which reflects years of schooling and professional occupations. This index increased by 0.010 standard deviations. Second, an economic self-sufficiency index indicates the number of years working and not in poverty, which rose by 0.004 standard deviations. The researchers note that this suggests that the food stamp program "pays for itself" over time by keeping children who have access to food stamps off of the public support payrolls as adults. Third is a neighborhood quality index, which tracks home and rent values as well as mobility to better neighborhoods. This index increased by 0.012 standard deviations. Last is a physical disability index, which tracks longevity and other key health metrics. Exposure to food stamps throughout childhood is associated with a gain in life expectancy of 0.18 years and a reduction in the likelihood of incarceration of 0.08 percentage points. The researchers did not have data to determine the precise underlying mechanisms for these improved outcomes.

The researchers also considered the long-term effects of food stamp access for families with children aged 6 to 18. The estimated benefits were nominal. The researchers suggest that supporting expecting mothers and new parents with food stamps translates directly into benefits for their children in adulthood.

— Jennifer Roche

How Consumers Respond to Calorie Information on Their Menus

Listing calorie counts on restaurant menus reduces the likelihood that diners will underestimate the number of calories in their orders, according to John Cawley, Alex M. Susskind, and Barton Willage. Their study, **Does Information Disclosure Improve Consumer Knowledge? Evidence from a Randomized Experiment of Restaurant Menu Calorie Labels** (NBER Working Paper 27126), explores the impact of a 2018 national requirement that chain restaurants with 20 or more locations provide consumers with calorie information.

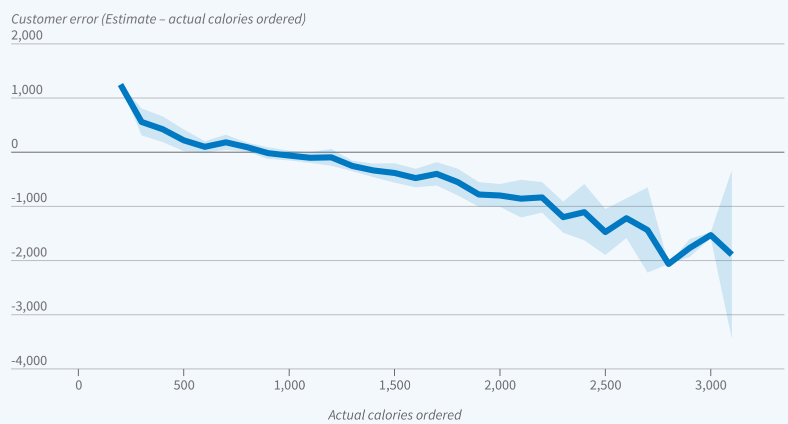
The requirement was introduced in hopes that improved consumer awareness of calorie intake might help to slow the rising US obesity rate. More than half of the average American's food budget is spent on away-from-home meals.

The researchers conducted a randomized controlled trial in a sit-down restaurant on a college campus. The study included 1,546 participants. Parties of restaurant patrons were randomized to either a control group, which received menus without calorie information, or a treatment group, which received menus with calorie counts. At the end of the meal, a researcher asked the study participants to provide demographic information as well as their estimate of the number of calories in their meal. This estimate was then compared with the actual number of calories in the meal that the participant had ordered, based on their receipt. The calorie counts were sourced from MenuCalc, a software based on the US Department of Agriculture nutritional database.

> Providing consumers with calorie information improves the accuracy of post-meal estimates of calorie counts by about 4 percent, or 65 calories.

Diners who did not receive information on calorie counts were often far from the mark in their estimates. Sixty percent underestimated the number of calories they ordered by at least 10 percent, 45 percent underestimated by at least 25 percent, and 14 percent underestimated the number of calories by 50 percent or more. As the number of calories actually ordered rose, the extent of underestimation also rose.

Customer Error (Estimate Minus Actual) vs. Actual Calories Ordered



Light-blue area represents 95% confidence interval
Source: Researchers' calculations using data from a randomized controlled field experiment designed by the researchers

Diners in the treatment group, who received calorie information on their menus, were 4 percent more accurate in estimating the number of calories in their meals than the control group, who received no such information. This is a difference of about 65 calories. The diners in the treatment group were also 29 percent less likely to underestimate the number of calories ordered by more than 50 percent.

While providing calorie information improved consumer knowledge, the typical diner who received this information still had trouble accurately estimating caloric intake. Even among the treatment group, the average absolute value of error was 34 percent or 436 calories — the equivalent of about one and a half cheeseburgers.

The researchers note that their participants were relatively well-educated, which could limit the generalizability of the findings. Forty-five percent of the participants had a graduate degree, another 26 percent were college graduates, and 18 percent were college students. The researchers did not find evidence that the effect of calorie labels varied by level of education.

—Jennifer Roche