COMMENTARY

The spread of COVID-19 shows the importance of policy coordination

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The outbreak of COVID-19 has forced communities to confront what sacrifices they are willing to make to quickly address threats to public health. The pandemic shock is unusual in its rapid appearance, but the question of trade-offs is nothing new. Environmental regulations, safety mandates, and the battles against other infectious diseases all impose both pecuniary and nonpecuniary costs on society in exchange for improved population health. Yet, even if we were to set aside, for a moment, the nonquantitative value of human life, the economic value attributed to the absence of activity limitations designed to protect public health can impose great costs on society through increased disease burdens. Such burdens can accumulate by retarding human capital accumulation and diminishing productivity (1), serving as a long-term drag on economic growth. Whether the full suite of benefits outweigh the costs in any particular case depends on a host of context-specific factors, including the nature of the health threat and the costs and effectiveness of the measures designed to curtail it. A recent article by Taylor et al. (2) reveals one such example: the significant costs incurred from continued operation of meatpacking facilities deemed "essential businesses" during the COVID-19 pandemic. Their evidence suggests maintaining operations amid the pandemic can contribute to the spread of COVID-19 both within the workforce and across local communities.

A simple aggregation of costs and benefits from any policy also misses important distributional concerns. These are generally not shared equally across members of society, and burdens tend to be more lopsided in the presence of externalities. An externality exists when an individual's actions carry costs or benefits that extend beyond themselves. The root exo, from the Greek for "outer," hints at the problem: Some consequences of the decision are outside the view of the decision maker. With COVID-19, as with other infectious diseases, the complication of externalities is baked into the cake. Any individual action undertaken that increases the probability of infection also increases the probability of transmission to others. No (wo)man is an island. Taylor et al. (2) shows an example of how such externalities apply to the actions of firms. The operation of meatpacking facilities means profits for the firm, employment for the workers, and lower meat costs nationally. But it also correlates with increased community spread of COVID-19, and the health burden from operations is borne by both workers and the surrounding community extending more than 150 km from the facility. Evidence from the Sturgis motorcycle rally, a gathering of over 500,000 motorcycle enthusiasts in South Dakota in August of 2020, suggests the same logic applies to spread over greater distances. The event generated substantial local economic returns, not to mention the enjoyment experienced by attendees, but one estimate suggests participation in the rally led to significant spikes in COVID-19 infection rates in the home counties of attendees, infecting nonparticipants thousands of miles from the event (3).

Adam Smith's "invisible hand," the basis for modern liberal economic policies, is predicated on the notion that, under proper conditions, what generates the most return for individuals also generates the most return for society. Modern economic theory tells us that, in the presence of externalities, the invisible hand falters. Private individual or firm decisions no longer coincide with what yields the greatest benefits for all. In the case of the current pandemic, many of the actions we can take to protect ourselves and our families from the disease generate benefits well beyond our households. Each step to prevent sickness also reduces the chance to spread that sickness to others. As we tend to undervalue the benefits that accrue to others, individuals underinvest in protective measures relative to levels that are socially desirable. Indeed, this may help explain resistance to mask wearing, particularly in the early phases of the epidemic when the belief was that nearly all benefits from masks took the form of protecting others, while all costs fell to the individual.

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In the case of meatpacking, political considerations compound the situation. Meatpacking plants were designated "critical infrastructure" by the Trump administration, and so could not be shut down by state health officials. The administrative order removes liability claims made by employees against their employer but fails to provide personal protection for workers. Aggravating the problem, Iowa's governor announced that meatpacking employees who refuse to work would be ineligible for unemployment benefits (4). Public policy thus exacerbated the tendency of individuals to take too little caution for the collective good, just when the government should have acted so as to increase personal protection and limit plant operations when it became clear the effective reproductive rate of the disease inside the plants was reaching levels that would lead to the significant spread documented by Taylor et al. (2).

Externalities also explain the difficulty in coordinating infection control efforts across state lines. The federalist nature of the United States means public health controls are largely left to the states, not the federal government. But the virus does not respect borders, and individuals and commerce cross state lines daily. One jurisdiction's decision to exchange higher infection rates for limited economic disruption can spill into nearby states engaging in extensive disease controls, reducing the returns to their economic sacrifices. And, just as the individual's decision to wear a mask can benefit others, benefits of state-level disease control spill outside borders, although much of the cost is felt internally, leading states to underinvest in protective measures. The federal government, whose jurisdiction includes the costs and benefits to all citizens, can steer policy to make state governments maximize welfare for the country as a whole rather than on a piecemeal basis.

The United States' battle against air pollution provides a road map for such actions. When President Johnson signed the original Clean Air Act of 1963 to address worsening air quality, the act left regulation of emissions almost entirely to the states. After realizing air pollution does not respect political boundaries, President Nixon signed the Clean Air Act of 1970, granting the federal government power to further address issues of interstate transmission and the inherent inequality of costs and benefits across states. The result was a drastically more effective policy. It allowed for a coordinated effort across disparate parties to seek the common good, and the Clean Air Act remains one of the most successful public health ventures in the United States to date (5).

There are several solutions to externality problems of this sort. Thus far, COVID-19 interventions have mostly taken the form of mandates: mask requirements, limits on group gatherings, and business shutdowns are prime examples. These have been met with various degrees of backlash. Incentive-based policies offer an intriguing alternative. Since private incentives are insufficient to induce appropriate behavior, the government can intervene to "internalize" externalities, and become the "visible hand" that guides us toward a better outcome. To do so, the government serves as broker and conveys the costs and benefits felt by others to individuals as they make private choices. Again, we have plenty of examples of successful interventions of this sort. To incentivize behavior that benefits others, we lower the costs and raise the benefits to the individual: We provide free flu shots (one person's immunity is another's lack of spread), subsidize higher education through grants and low-cost loans (an educated citizen is a gain to all), and provide tax breaks on research and development costs (spreading knowledge lets us stand on the shoulders of giants). To discourage behavior that imposes costs on others, we make the behavior more expensive: We charge congestion fees to reduce traffic (one person's choice to drive makes every else's commute longer), tax pollution (a firm's production damages the health of those downwind), and assign late fees to overdue library books (one person's delay in return makes another person's enjoyment of the book more difficult).

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Much like the talk of a global carbon tax to make firms and individuals internalize the costs of their greenhouse gas emissions, governments might consider taxes on infectious behavior. Such a tax would help individuals confront the social costs of deciding to engage in risky activities. This idea may not be as radical as it sounds: Mandates are implicitly incentive based as well, since individuals and firms weigh the costs of compliance against punishments for noncompliance. If taxing risky behavior is undesirable, governments can achieve the equivalent by rewarding safe behavior: Pay individuals to wear masks and reduce social mixing, and pay businesses that pose the greatest risk of increasing transmission to remain closed. One advantage to making those incentives explicit is that freedom of choice, which has preoccupied so much of the policy debate around COVID-19, is a prominent feature of the policy instrument.

It is tempting to think this problem will end with the arrival of a vaccine; however, even an effective vaccine suffers externality challenges. When an individual chooses to get a vaccine, they protect not only themselves but also others. Predictably, private actors vaccinate too little. The problem becomes more acute as we approach herd immunity and the personal benefits from immunization decrease. It is precisely this phenomenon that makes it difficult to sustain infectious disease elimination (6). This tendency is made even worse when people falsely believe that a vaccine is risky—a belief that is more tenable when the personal risks of disease are low—which explains why vaccination rates in some zip codes in the United States fall below some parts of sub-Saharan Africa (7). Here, again, government interventions are required: through either credible information campaigns or the mandating of vaccinations, or by providing sufficient subsidies to induce their uptake. Some may find "bribing" others to engage in socially beneficial behavior a tough pill to swallow: Shouldn't people think of others because it's the proper thing to do in a society? But such payments are not bribery, they are a way of sharing gains we obtain from the productive behavior of others, encouraging them to do more despite the costs they face. Why should a government not, for example, compensate the worker that sacrifices income by staying home when they feel ill? By contrast, firms have no such incentive, and instead pushed workers to engage in the exact opposite behavior, offering "responsibility bonuses" for workers that didn't miss any workdays amidst the pandemic in April of 2020 (8).

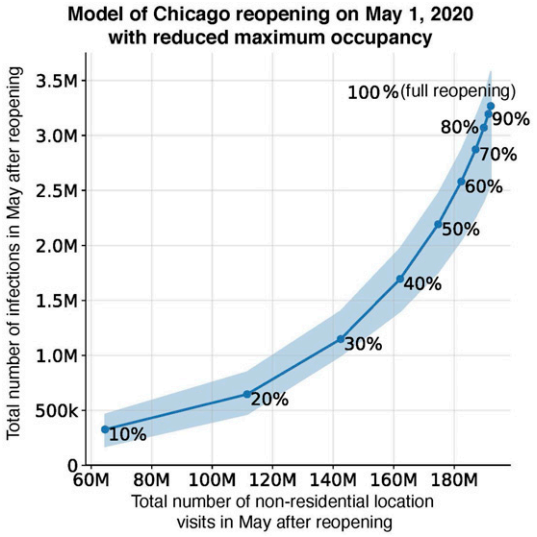

Fig. 1. COVID-19 infection rates as a function of the number of visits to businesses and public places in the city of Chicago based on a simulation approach using mobile phone tracking data as described in Chang et al. (9). The model predicts that infections rise nonlinearly with the number of visits to businesses and public places. This highlights the trade-offs between infections and activity restrictions. For example, reducing visits by 50% prevents ∼1 million infections. Shading indicates the 95% confidence interval. Image credit: Serina Chang (Stanford University, Stanford, CA), Emma Pierson (Stanford University, Stanford, CA), Pang Wei Koh (Stanford University, Stanford, CA), Jaline Gerardin (Northwestern University, Chicago, IL), Beth Redbird (Northwestern University, Evanston, IL), David Grusky (Stanford University, Stanford, CA), and Jure Leskovec (Stanford University, Stanford, CA).

While Taylor et al. (2) focus on the meatpacking industry, they also provide suggestive evidence that the core findings may extend to manufacturing more generally. Should we expect similar effects from hotels, restaurants, and other places of business? What about schools and institutions of higher learning? In most cases, personal infection consequences are small, which makes the risk of business as usual appear low to the individual. The community risk, however, grows the more individual risk we combine. In a recent article, Chang et al. use models of mixing based on cell phone data to show how rapidly the risk of infecting others rises as the economy returns to normal (9). Fig. 1, based on their analytical approach, uses cellphone location data from Chicago to model expected disease spread driven by a variety of nonresidential movements from both locals and tourists. The figure demonstrates the spillover effect of disease. The relationship between activity levels and infections is nonlinear. Predicted cases rise the more individuals circulate, and rise even faster when those individuals become crowds. How should we balance the benefits to firms and local communities against the costs that extend beyond their boundaries? What policies can we implement to tilt the scales toward a more desirable and just distribution of outcomes?

When the pandemic recedes, our attention to trade-offs will likely dissipate, but the fundamental issues will remain. They are implicit in the social contract between every citizen and their government (10), and it is not surprising a pandemic has brought them to center stage. Thomas Hobbes, the godfather of social contract theory, was preoccupied with the threats of the black plague when he outlined the details of his political philosophy predicated on the sacrifice of personal freedom in exchange for collective protection (11). The COVID-19 pandemic shines a light on the complications that come with an increasingly interconnected world. The consequences of our individual actions extend beyond our social circles more than ever before. It is time to turn to policies aimed at addressing externalities: Let the visible hand have a turn at the wheel.

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