Science Alone Can't Heal a Sick Society

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In the winter of 1848, a 26-year-old Prussian pathologist named Rudolf Virchow was sent to investigate a typhus epidemic raging in Upper Silesia, in what is now mostly Poland.

After three weeks of meticulous observation of the stricken populace — during which he carefully counted typhus cases and deaths by age, sex, occupation and social class — he returned with a 190-page report that ultimately blamed poverty and social exclusion for the epidemic and deemed it an unnecessary crisis. "I am convinced that if you changed these conditions, the epidemic would not recur," he wrote.

Dr. Virchow was only a few years out of medical school, but his report became the foundational document of the new discipline of social medicine. His vision for health went far beyond individuals and the pathogens lurking inside them: He pioneered the careful epidemiological examination of social conditions such as housing, education, diet and lifestyle, and he denounced the rigid social stratification perpetuated at the time by the Catholic Church.

The same conditions of inequality that produced the Silesian typhus epidemic would soon foment a political revolution in Germany, and Dr. Virchow's investigation helped turn him into a political revolutionary. "Medicine is social science and politics nothing but medicine on a grand scale," he wrote.

For epidemiologists studying the coronavirus today, that scale is still gauged by the mundane act of counting. The counting starts with descriptive statistics on the daily state of the pandemic — who's infected, who's sick, how many have died. And then those numbers are used to forecast the pandemic's future, which lets officials plan and mobilize resources. Epidemiologists use those data to discern patterns over time and among different groups of people, and to determine reasons some get sick and others don't. That's the hard part of epidemiology.

We know that the SARS-CoV-2 virus is the cause of Covid-19, and in that sense the story is very simple. But why does one exposed person get infected and not another? Despite more than 200 million detected cases worldwide, scientists still don't understand much about transmission, nor what makes an infected person sick enough to be hospitalized, beyond simple demographics like age and sex.

Nearly half a million scientific papers have now been published on Covid-19, and they marshal a dizzying array of hypotheses to explain the patterns observed, but a vast majority of those conjectures quickly fizzle out. Numerous studies early on noted the relative absence of Covid-19 cases in Africa and South Asia, for example, leading to many environmental, genetic and behavioral conjectures, until suddenly African countries and India also were devastated by soaring caseloads. Thus so many epidemiological theories came and went, such as the impacts of altitude and blood type. But one consistent association held on, and it's the same one that Dr. Virchow found in Upper Silesia: Our current pandemic is socially patterned.

This remains one of the few pervasive observations that consistently describes risks of infection, hospitalizations and death from Covid-19 around the world. Yet while wealth correlates with those who can work from home and order groceries online in rich countries, it explains less well the patterns among larger aggregations of people across states and nations. At this level, it appears that the more salient features that distinguish pandemic severity are relational factors like economic equality and social trust. It comes as no surprise to even the casual observer that the pandemic struck most ferociously in countries ridden with political division and social conflict.

For example, consider the number of excess deaths across countries during the pandemic. Looking at those countries most severely affected, such as Peru, Bolivia, South Africa and Brazil, one sees mostly middle-income countries in political turmoil and with weak social institutions. Countries that had fewer deaths than would be expected based on prepandemic trends, on the other hand, are often richer, but also distinguished by high levels of political cohesiveness, social trust, income equality and collectivism, like New Zealand, Taiwan, Norway, Iceland, Japan, Singapore and Denmark. Many investigators have reached similar conclusions in research within and among countries on measures of political polarization, social capital, trust in government and income inequality.

It makes sense that political polarization hampers effective pandemic response, but this is where explanatory inference gets trickiest, because we epidemiologists exist like everyone else inside the social forces that shape the pandemic. We are citizens as well as scientists, none of us immune to politicization and the way that it distorts perceptions and inferences.

For example, how did the effectiveness of a drug like hydroxychloroquine become a political litmus test, rather than a question for dispassionate clinical study? Nothing is gained when basic scientific and policy questions become ideological footballs to be inflated and tossed around. The United States is the dominant biomedical research entity in the world, and so its flagrant political dysfunction became a global problem. This infused everything that we epidemiologists did with doubt, suspicion and the whiff of partisanship.

Politics has dogged us at every turn in these past 18 months — astonishing failings at the C.D.C. and F.D.A. under political appointees, the politicization of proven interventions like masks and vaccines, and more. Take the return to in-person schooling. By April 2020, over three-quarters of the world's schoolchildren were at home, yet we quickly learned enough to safely reopen schools for younger children — with measures like masking and ventilation — and this is indeed what happened in much of Canada, Europe and Asia.

But that progress from evidence to policy hit a brick wall in the United States when the Trump administration aggressively promoted resumption of in-person schooling as a crucial step toward economic recovery. When the former president threw his weight behind the priority that children should be back in classrooms, blue-state politicians, teachers unions and many epidemiologists were adamantly opposed. Rational discourse about the policy question became all but impossible. Every interpretation of evidence became colored by the suspicion that it was in the service of a political allegiance.

Science is a social process, and we all live amid the social soup of personalities, parties and power. The political dysfunction that holds America hostage also holds science hostage. Dr. Virchow wrote that "mass disease means that society is out of joint." Society's being out of joint means that epidemiological research is out of joint, because it exists inside the same society. This is not a new problem, but the dominant "follow the science" mantra misses the fact that the same social pathology that exacerbates the pandemic also debilitates our scientific response to it.

To restore faith in science, there must be faith in social institutions more broadly, and this requires a political reckoning. Of course one can cite many specific challenges for scientists: The wheels are coming off the peer review system, university research is plagued by commercialization pressures, and so on. But all of these are the symptoms, not the underlying disease. The real problem is simply that sick societies have sick institutions. Science is not some cloistered preserve in the clouds, but is buried in the muck with everything else. This is why, just eight days after his investigation in Upper Silesia, Dr. Virchow went to the barricades in Berlin to fight for the revolution.

More on obstacles in pandemic response

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