



Observations

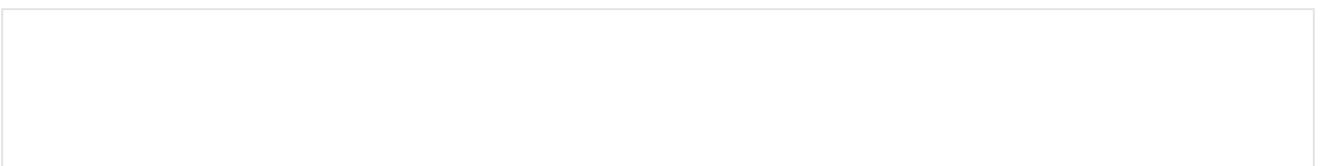
How to Save \$45 Billion on Health Care Costs Each Year

Nearly 700,000 people get sick or die each year from infections they get in the hospital—most of which are preventable

By Oliver Whang on May 3, 2019



Credit: Getty Images



Of the many ways to die in the modern world, few seem as perverse as this: you walk into the hospital with a minor illness and leave in a casket.

Yet such a fate is becoming an increasingly prevalent reality, even as medical technologies advance. This is mainly due to drug-resistant infections—infections caused by strains of bacteria and fungi that have evolved to be immune to the majority of modern medicines. More and more of these organisms have developed over the past decades as a result of a systemic overuse and misuse of antibiotics and antifungals. They cause infections hospitals don't have the know-how or resources to deal with, and can spread rapidly between patients within health care facilities, and between health care facilities themselves, sickening and killing many.

Drug-resistant infections are part of a larger problem the American health care system is facing: that of health care–associated infections (HAIs). Every year around 72,000 people die from infections contracted in American hospitals and health care facilities. An additional 615,000 people treated in these institutions—3 percent of all hospitalized patients—find themselves sicker than if they had not sought out help at all, according to the Centers for Disease Control and Prevention (CDC).

This issue is more than just a matter of life and death; it is also one of dollars and cents. The total annual cost of HAIs has been estimated to run up to 45 billion dollars—more than the GDP of most small countries, and a couple of large ones as well. This cost is shouldered by health care facilities and hospitals, bleeding out onto the government, and taxpayers, via programs like Medicaid and Medicare.

The \$45 billion cost analysis doesn't even include indirect costs, like a hesitancy among prospective patients to take part in the health care system. Why would you go to a hospital if you thought you would only come out sicker? And why would you want to pay for services at that hospital?

The good news is that most health care–associated infections are preventable. Simple things like proper hand sanitization, waste management and careful sterilization at skin injection sites have cut the rates of HAIs—and the costs they incur—by more than half over the past decade. All the same, these steps have not been enough. The problem remains, looming, and threatens to get worse in the future.

As the American population ages one of the greatest dangers hospitals face is the potential of HAIs—and specifically drug-resistant infections—to spread with patients as they move from facility to facility. Current cost calculations don't take this movement into account, but as health care facilities bend to accommodate a growing number of high risk patients, transfers between hospitals will become more frequent, and the probability of a new deadly infection being introduced will increase.

To illustrate this problem, in a 2014 [TED Talk](#), Ramanan Laxminarayan—senior research scholar and lecturer at Princeton University—said: “We don't consider—and we, including individuals, patients, hospitals, entire health systems—do not consider the costs [imposed] on others by the way antibiotics are actually used.”

Each time an antibiotic is misused and a new strain of bacteria evolves with an immunity to that antibiotic, scientists must develop a *different* antibiotic to treat the new infection caused by the new bacteria. Then they must distribute the newly developed antibiotic to hospitals, by which time patients could have gotten sick and died. It's a race to evolve, essentially. A race against nature. And we're going to lose.

“This is clearly not a game that can be sustained, or one that we can win by simply innovating to stay ahead,” said Laxminarayan. “We've got to slow the pace of coevolution down.”

Recognizing this, the government has recently focused more resources towards the prevention of health care–associated infections. In 2013 the U.S. Department of Health and Human Services (HHS) implemented a “national action plan” to educate health care providers about prevention measures. A large part of this plan, which was added in 2018, includes an “antimicrobial stewardship” program to purvey information on how to most safely use antibiotics.

The government has also turned towards economic incentives as a possible way to decrease rates of HAIs. Because the emergence of a hospital-born infection in one hospital is a problem for all other hospitals, punishing health care facilities with the highest number of infected patients could have a positive impact on the entire American healthcare system.

The Centers for Medicare and Medicaid Services (CMS) started a [program](#) in 2014 under the Affordable Care Act to do just that—take money away from hospitals with the highest rates of HAIs. The program reduces Medicare reimbursement for these hospitals by 1 percent. This may not sound like a lot, but it adds up. Total Medicare spending on patients in hospitals was [\\$142 billion](#) in 2016.

The CMS's program has been criticized for drawing an arbitrary line between which hospitals get punished and which don't. The bottom 25 percent of hospitals—determined by a holistic metric—get their Medicare payments reduced, while those above that line are fully reimbursed by the program.

Some questions are then raised: How should we incentivize hospitals to increase infection prevention measures? Whose behavior should be punished, and whose behavior should be rewarded (if at all)? Does the CMS have it right?

A recent paper co-authored by Sarah Drohan, Simon Levin (James S. McDonnell Distinguished University Professor in Ecology and Evolutionary Biology at Princeton University) and Laxminarayan, published in the *Proceedings of the National Academy of Sciences* (PNAS), found that although subsidies may be able to reduce cases of HAIs, the current government approach does not do so in a productive way. Government subsidies work, but not as they are implemented now.

The paper compares, in a mathematical economic framework, the effect different types of subsidies have on the number of infections acquired in hospitals. The current CMS policy—to essentially tax hospitals with high numbers of infected patients—was shown to be only a fraction as effective as a subsidy that gives an additional dollar to hospitals for each dollar spent on infection control.

“The fundamental reasoning for that is somewhat simple,” says Drohan. “It’s just that [a dollar for dollar subsidy] is a more effective way of tying the amount hospitals receive from the policymaker to their own spending. It's the most effective way to encourage them to spend more, because the more money they spend, the more money they get.”

Instead of punishing hospitals that have a high rate of HAIs, Drohan, Levin and Laxminarayan advocate for the opposite: rewarding hospitals with the fewest HAIs. It's a simple perspective shift—from a negative incentive to a positive one—but it could make all the difference.

In fact, Drohan and Ramanan go even further in the paper, suggesting that government subsidies should be, paradoxically, given almost entirely to hospitals with the lowest rates of HAIs. “What we found was that the subsidy, or the majority of the policymaker money—in fact all of it for the best possible outcome—should be given to the institution with the lowest transmission rate, which means the least infectious institution,” Drohan says.

In other words, all money should be given to the hospitals that least need it. Hospitals with the lowest numbers of infected patients.

This seems, to put it bluntly, unfair. It stands to reason that hospitals with the fewest infected patients would need the least help from the government. What Drohan, Levin, and Laxminarayan found, though, was that when they factored in the movement of patients between hospitals they were no longer trying to minimize the number of infected patients in each hospital but minimize the number of infected patients *as a whole*. It became a different kind of economics problem—a question not about individual patients, but of the common good.

“From a simple economics point of view, the marginal return on your subsidy dollar is a lot greater when you give it to the hospital with the lower transmission rate,” Drohan says. Each dollar given to the hospitals with the fewest infected patients, because of the way patients move between facilities and the economic forces behind the health care system, goes further in reducing the overall rate of HAIs. Looking at the entire health care system, that is the best way to use the government’s money.

And although giving more support to those facilities with the fewest people in need is totally counterintuitive, perhaps it is just something we need to try to wrap our heads around. We as a society are used to looking at the individual—the individual hospital, the individual family, the individual patient—but sometimes we need to look at the issue as a whole.

“When I was writing other drafts of this, I kept wanting to say it’s the opposite of what we think our moral argument should be,” Drohan says. “But in a way I’ve sort of convinced myself that you have to sort of step above that, and think: But what’s actually best in the long term?”

The views expressed are those of the author(s) and are not necessarily those of Scientific American.

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